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Rights of every mother and child- A priority group for public health action

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English dramatist, Maria Lovell- wrote,
Two souls with a single thought, Two hearts that beat as one.

Introduction

Motherhood is a precious phase of all women and having healthy baby is always a blessing for her. It boosts her individuality as a mother and she is able to nurture the baby in a better way.

Mother is always considered to be the best friend, philosopher and guide to a child. She is the only person in whom the baby finds comfort and pleasure. By providing best of care and knowledge to mother we can expect better outcome at the end of the day.

Women and children are the most vulnerable section of the society. It is therefore, vital to improve their health and well-being in order to achieve complete development of overall human resources.

One of the core function assigned to the WHO in its constitution of 1948 was to "promote maternal and child health and welfare." By the 1950s, national health plans and policy documents from development agencies invariably stressed that mothers and children were vulnerable groups and, therefore, priority "targets" for public health action.

The notion of the mother and children as vulnerable group was also central to the primary health care movement launched at central to the primary health care movement launched at Alma-Ata in 1978.

The plight of mothers and children soon came to be seen as much more than a problem of biological vulnerability. The 1987 call to action for Safe Motherhood explicitly framed it as "deeply rooted in the adverse social, cultural and economic environment of the society, and specially the environment that societies create for women."

Women's relative lack of decision-making power and their unequal access to employment, finances, education, basic health care and other resources are considered to be the root cause of their ill-health, and that of their children. The unfairness of this situation has made it obvious that the health of mothers and children is an issue of rights, entitlements.

Maternal and Child health

The concept of maternal and child health was put into practice only recently (after 1900 in the west and after 1950 in India).

Till 1953, the MCH services in the districts were patchy and were rendered through maternity homes or trained midwives. The latter were under the control of the civil surgeon and their services were mostly curative and institutional. From 1955 onwards, MCH services were linked with primary health centers in the rural areas. In urban areas, these services are rendered through MCH centre's or maternity homes run by the Local Bodies.

Remarkable progress has been made in the saving lives of expectant mothers and infants through the MCH services. This is particularly noticeable in the advanced countries. These services were initially started with the sole aim of reducing infant and maternal mortality. At present, these services definitely play a positive role in the welfare and health of the mother and the child. The present scope of these services is therefore very broad.

Milestone in the establishment of the rights of woman and children

In the 20th century several international treaties came into being, holding signatory countries accountable for the human rights of their citizens. Over the past two decades United Nations Bodies, as well as international, regional and national courts, have increasingly focused on the human rights of mothers and children.

1948: The Universal Declaration of Human Rights states that "motherhood and childhood are entitled to Special care and assistance."

1952: The General Conference of the International Lab our Organization adopts the Maternity Protection Convention.

1959: The Declaration of the Rights of the child.

1966: The International Covenant on Economic, Social and cultural Rights recognized the right to the highest attainable standard of physical and mental health.

1981: The Convention on the Elimination of All Forms of Discrimination against Women enjoins States parties to ensure appropriate maternal health services.

1989: The Convention on the Rights of the Child guarantees children's right to health. States commit themselves to ensuring appropriate maternal health services.

1990: At the united Nations World Summit on Children governments declare their "joint commitment...to give every child a better future", and recognize the link between women's right and children's well-being.

1993: The United Nations Human Right Committee expresses concern over high rates of maternal mortality.

1994: The United Nations international Conference on Population and Development and the

1995: United Nations Fourth World Conference on Women affirms women's right of access to appropriate health care services in pregnancy and childbirth.

1996: The United Nations United Nations Human Rights Committee rules that, when abortion gives rise to a criminal penalty even if a woman is pregnant as a result of rape, a woman's right to be free from inhuman and degrading treatment might be violated.

2000: The United Nations Committee on Economic, Social and Cultural Fights states that measures are required to "improve child and maternal health, sexual and reproductive health services.

2003: The United Nations Committee on the Rights of the Child states that adolescent girls should have access to information on the impact of early marriage and early pregnancy and have access to health services sensitive to their needs and rights. The United Nations Committee on the Rights of the Child adopts its General Comment on HIV/AIDS and that on the Rights on the Child.

2003: The United Nations Commission on Human Rights, states that sexual and reproductive health are integral elements of the right to health.

2004: The United Nations Committee against Torture calls for an end to the extraction of confessions for prosecution purposes from women seeking emergency medical care as a result of illegal abortion. The United Nations Special Reporter on the Rights to Health reports that all forms of sexual violence are inconsistent with the right to health.

2004: The United Nations Sub-Commission on the Promotion and Protection of Human Rights adopts a resolution on "harmful traditional practices affecting the health of women and the girl child."

Rights of the women & children

Women and children are the most vulnerable section of the society. It is therefore, vital to improve their health and well-being in order to achieve complete development of overall human resources.

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Rights of the child

One of the most encouraging signs of our times is the awakening of the public to the needs and rights of children. The needs of children and our duties towards them are enshrined in our constitution; the relevant articles are:

- Article 24 prohibits employment of children below the age of 14 in factories;
- Article 39 prevents abuse of children of tender age, and
- Article 45 provides for free and compulsory education for all children until they complete the age of 14 years.
- In the country's Five Year Plans, special attention has been given to the welfare of children particularly the weaker sections. Various schemes have been introduced and implemented to achieve this goal. However, despite constitutional provisions, organized efforts for stepping up child welfare services did not take place until 1959.

Un declaration of the rights of the child

The year 1959 ushered in a new era in child welfare. To meet the special needs of the child, the General Assembly of the United Nations adopted on 20th November 1959, the Declaration of the Rights of the Child. India was a signatory to this Declaration.

The rights of the Child are

- Rights to develop in an atmosphere of affection and security and, wherever possible, in the care and under the responsibility of his/her parents.
- Rights to enjoy the benefits of social security, including nutrition, housing and medical care.
- Rights to free education.

- Rights to full opportunity for play and recreation.
- Right to a name and nationality.
- Rights to special care, if handicapped.
- Right to be among the first to receive protection and relief in times of disaster.
- Rights to learn to be a useful member of society and to develop in a healthy and normal manner and in conditions of freedom and dignity.
- Rights to be brought up in a spirit of understanding, tolerance, friendship among people, peace and universal brotherhood; and
- Rights to enjoy these rights, regardless of race, color, sex, religion, national or social origin.

Conclusion

Various programs launched by Govt. of India like Integrate Child Development Services(ICDS), Reproductive and Child Health(RCH) and now Millennium Development goals(MDGs) the major umbrella program enveloping all i.e national Rural Health Mission and Urban health mission (NRHM) have from time to time tried to fill in this lacuna in the system. Janani Suraksha Yojana/integrate management of neonatal, childhood illnesses (IMNCI) has been one of the major breakthroughs we have achieved through NRHM which is addressing this concern of ours. Now through it the government is able to reach to the grassroots and is promoting this yardstick program to achieve maximum of hospital deliveries which indirectly bring about a healthy mother and a healthy baby.

The time has come to awaken & to sensitize our self to the need of the hour i.e to brighten future of the country by providing healthier generations.

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A study of the effects of antiepileptic drugs on thyroid hormones

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Abstract

The long term use of antiepileptic drugs therapy shows adverse effect on endocrinal system, specially thyroid functions in epileptic patients. One hundred and twenty epileptic patients who had been on various antiepileptic drugs therapy were selected for the study of their thyroid hormones. The study found a significant decreased serum levels thyroid hormonesT3, T4 in patients receiving antiepileptic drugs and it is also observed bitherapy altered more then single drug therapy. The results indicated that the long-term use of antiepileptic therapy significantly decreased thyroid hormone level and causes subclinical hypothyroidism and it increase with duration of therapy. It is suggested thyroid function should be regularly monitored in patients undergoing such treatment.

Key words

Antiepileptic drugs(AEDs), Epilepsy, Thyroid hormones, Endocrinological system, Seizure.

Introduction

Epilepsy is a commonest primary dysfunction of the brain and has been of considerable interest to scientists since the beginning of medical history. In majority of epileptics, the causes are not known but they have to be treated with various antiepileptic drugs for long period. Antiepileptic drugs (AEDs) are a heterogeneous group of compounds widely used in both adults and children. These drugs are related to various adverse effects involving several organs mostly in endocrinal system by increase activity of hepatic micro some. In particular, relevant effects on thyroid function have been described. Oppenhemier and co-worker[1] showed a decline in protein bound iodine (PBI) in adults undergoing phenytoin therapy. More recent investigations have revealed that patients on antiepileptic drug therapy also have decreased total thyroxine T4, free T4 and triiodothyronine T3[2]. These changes were explained as a result of conversion of T4 to T3. The aim of this study is to analyze the principal alterations in thyroid function caused by AEDs therapy. Phenytoin, phenobarbitone, carbamazepine are the most widely used antiepileptic drugs for the treatment of all seizures[3]. These drugs will probably continue to be the major agents for the treatment of partial and generalized epilepsy for at least the next decade. Although they have been moderator effective in managing seizures. Each has undesirable side effects. Recent studied have shown that optimal use of single drug therapy is often as effective as the use of two or more drugs therapy and it is frequently less toxic[4]. Thus, an understanding of the appropriate use of the available drugs are great importance. Phenytoin (PHT) was introduced for the treatment of epilepsy in 1938[5]. The success of PHT as an anticonvulsant was one of the major pharmacological advances in treating neurological diseases and favorably altered the lives of many people with epilepsy worldwide. PHT produces effective anticonvulsant action without less sedation, and it is one of the most effective compounds for treating generalized tonic-clonic seizures[6,7] and status epilepticus[8,9]. The present study was undertaken to see the effect of anticonvulsant drugs on serum level of thyroid hormone.

Materials and methods

One hundred and twenty cases of epilepsy both male and female which had been on various anticonvulsant drugs , attending all clinical departments of Saraswathi Institute of Medical Sciences Hapur, Ghaziabad,U.P, India, from, March 2008 to December 2009 were selected for the present study. Detailed clinical history and physical examination was done of every patient. Patients suffering with diabetes mellitus, nephrotic syndrome, myxoedema and familial hypercholesterolemia, obesity and menstrual disorder, which might affect thyroid hormones were excluded. Sixty healthy individuals preferably relatives of patients were selected to serve as normal control. After an overnight fast of 14-16 hours, 5ml blood samples of patient and control were collected in vacuum tubes and allowed to clot at room temperature for 60-120 minute followed by centrifugation at 3000 g for 10 min. at 40C. Serum was stored at -20C, for estimation of thyroid hormones T3 and T4 by EIA method[10], kits were supplied by span diagnostics.

Estimation of serum T3 and T4

The assay was based on a competitive reaction principle. After separating T3 and T4 from its carrier protein TBG (Thyroxine Binding Globulin), thyroxine binding pre-albumin, albumin using 8-Anilino-1- Naphthalene Sulfonic acid (ANS) and sodium salicylate, the assay was performed in two steps:

A. Immunological steps:

B. Enzymatic step:

In immunological step 100 µl of standard, control, sample and 400 µl of conjugate solution were added in ant-T3 and T4 tubes and incubated 2 hours at 18-25C in the dark. Liquid was aspirated from each tube. After this working wash solution was rapidly dispensed in a series of 48 tubes, it was immediately aspirated and washing procedure was repeated thoroughly.

In enzymatic step 500 µl of color working solution were added in all tubes including EIA reagent blank tube. After this all tubes were incubated for 30 minute at 18-25C in dark. In last 2ml of stopping reagent were added in all EIA tubes.

The mean absorbances of each standard were read at 492nm against the reagent blank. These values were plotted on graph paper and a curve was drown. Mean absorbance was calculated for each sample. The concentration of T3 and T4 were read on the curve.

Results

The study was conducted on 120 patients (84 male and 36 female) of different age group who were on various anticonvulsant drugs therapy for at least 3 years. 60 healthy age and sex matched individuals served as control.

Table no-1 shows the distribution of patients according to age group. The result shows maximum patients (57) 47.5% were in the age group of 10-19 years followed by (42) 35% were in age group of 20-29 years, while the least (03) 2.5% were in age group of 40 years and above.

Table no-2 shows the distribution of patients according to duration of anticonvulsant therapy. The result shows maximum patients(72) 60% were on 3-6 years of anticonvulsant therapy followed by (33)35% were on 7-10 years, while the least (15) 12.5% were on 11-15 years of anticonvulsant drugs therapy.

Table no-3 shows the distribution of patients according to various anticonvulsant therapy used. The result shows maximum patients (36) 30.9% were on phenytoin alone or on phenytoin & phenobarbitone therapy followed by (30)25% were on phenytoin& carbamazepine therapy, while the least (18) 15% were on alone carbamazepine therapy.

Table no-4 shows level of serum T3 and T4 in epileptic patients on phenytoin therapy were significantly decreased T4 1.26. ±0.34 nmol/l and, 69.66±16.43 mg/dl respectively as compared to control p<0.001.

Table no-5 shows level of serum T3 and T4 in epileptic patients on carbamazepine therapy were significantly decreased 1.29.±0.32 nmol/l and, 71.04±15.26 nmol/l respectively as compared to control p<0.001.

Table no-6 shows level of serum T3 and T4 in epileptic patients on phenytoin & carbamazepine therapy were significantly decreased 1.18.±0.34 nmol/l and 62.18±15.86 nmol/l respectively as compared to control p<0.001.

Table no-7 shows level of serum T3 and T4 in epileptic patients on phenytoin& phenobarbitone therapy were significantly decreased 1.08.±0.30 nmol/l and 59.03±15.12 nmol/l respectively as compared to control p<0.001.

Table no-8 shows that out of 120 patients of epilepsy, 72 were on 3-6 years (group A) of anticonvulsant therapy, 33 were on 7-10 years (group B) and 15 patients with 11-15 years were included in group C. The result shows level of serum T3 and T4 were significantly decreased up to 10 years of long term anticonvulsant therapy and beyond this there were no significant change in thyroid hormones.

Comparison beween

A&B	p value	<0.001	<0.001
B&C	p value	N.S.	N.S.
A&C	p value	<0.001	<0.001

Table 1: Distribution of patients according to age.

Age group (Years)	No of patients	Percentage
Less then 10	03	2.5%
10-19	57	47.5%
20-29	42	35.0%
30-39	15	12.5%
40 and above	03	2.5%
Total	120	100%

Table 2: Distribution of patients according to duration of anticonvulsant therapy.

Duration of therapy (Years)	No of patients	Percentage
3-6	72	60%
7-10	33	27.5%
11-15	15	12.5%
Total	120	100.0%

Table 3: Distribution of patients according to various anticonvulsant drugs used.

Drugs	No of patients	Percentage
Phenytoin	36	30.0%
Carbamazepine	18	15.0%
Phenytoin & Carbamazepine	30	25.0%
Phenytoin & Phenobarbitone	36	30.0%
Total	120	100.0%

Table 4: Thyroid hormones concentration in patients receiving Phenytoin and in control

Serum concentration (nmol/l	Phenytoin (no=36) mean ± S.D.	Control (no=60) mean ± S.D.	P value
T3	1.26±0.34	1.65±0.29	<0.001
T4	69.66±16.43	85.98±14.28	<0.001

Table 5: Thyroid hormones concentration in patients receiving Carbamazepine and in control.

Serum concentration (nmol/l	Phenytoin (no=18) mean ± S.D.	Control (no=60) mean ± S.D.	P value
T3	1.29±0.32	1.65±0.29	<0.001
T4	71.04±15.26	85.98±14.28	<0.001

Table 6: Thyroid hormones concentration in patients receiving both phenytoin & Carbamazepine and in control

Serum concentration (nmol/l	Phenytoin & Carbamazepine (no=30) mean ± S.D.	Control (no=60) mean ±S.D.	P value
T3	1.18±0.34	1.65±0.29	<0.001
T4	62.18±15.86	85.98±14.28	<0.001

Discussion

The present study was carried out from March 2008 to December 2009 on one hundred and twenty patients (84 male and 36 female) of epilepsy, attending OPD of all clinical departments at Saraswathi Institute of Medical Sciences Hapur, Ghaziabad UP India. The epilepsy comprises a broad range of chronic symptomatic manifestations of central nervous system and approximately 75 % of patients with convulsive seizures can have their attacks controlled completely or reduced in frequency and severity by use of antiepileptic drugs. Although these drugs are not a cure of epilepsy, their use is most important facet of treatment of seizures. The choice of the specific drug to be used will be determined not only by its potential efficacy, but by its relative freedom from side effects which would limit its use in specific instances, which drug is used, patient must be educated to understand the need for compliance, the concept of therapeutic blood levels and the recognition of both dose related and idiosyncratic side effects. Phenytoin, carbamazepine and phenobarbitone are drugs of choice against partial and generalized tonic-clonic seizures[11]. When each one of these three drugs fail to control seizures, a combination of two most effective among them can be used[12]. The practice of combining antiepileptic drugs has been increasingly criticized[13] because a reduction in the number of drugs is usually associated with fewer side effects[14] and combination of two drugs seem to add little benefit when one drug has failed[15]. The recent investigations have revealed that phenytoin treated adults have decreased thyroid hormones[16]. These changes were explained as the result of rapid conversion of thyroxine to triiodothyronine[17]. It was emphasized in all investigations that the patients were euthyroid. Patients undergoing antiepileptic drugs therapy frequently exhibit side effects such as weakness, fatigue, lack of motivation and constipation which are usually judged to be sedative effects of these preparations. These symptoms, however, may be the first sign of a hypothyroid state. The study

Table 7: Thyroid hormones concentration in patients receiving both phenytoin & phenobarbitone and in control

Serum concentration (nmol/l	Phenytoin & Phenobarbitone (no=36) mean ± S.D.	Control (no=60) mean ±S.D.	P value
T3	1.08±0.30	1.65±0.29	<0.001
T4	59.03±15.12	85.98±14.28	<0.001

Table 8: Relationship between thyroid hormones concentration and the duration of anti convulsant therapy

Duration of therapy (years)	No of patients	Serum T3 concentration (nmol/l)	Serum T4 concentration (nmol/l)
A. 3-5	72 mean ± S.D.	1.31±0.34	71.49±16.03
B. 6-9	33 mean ± S.D.	1.04±0.31	55.23±15.25
C. 11-15	15 mean ± S.D.	0.98±0.33	53.85±15.42

shows decreased concentration of serum T3 and T4 in patients on long term treatment with phenytoin have been repeatedly documented[18]. An acceleration of T4 clearance via stimulation of the microsomal system in the liver now seems to be the most likely explanation for this effect[19] and the changes of thyroid hormone level on carbamazepine has been attributed to an increase in extra thyroidal metabolism of thyroxine and triiodothyronine[20]. Other agents such as phenobarbitone have shown to produce a fall in serum T4 concentration which coincides temporarily with hepatic enzyme induction[21]. The authors found that accelerated hormone metabolism was responsible for decreased thyroid hormone levels and hepatic microsomal enzyme system metabolizing thyroid hormone to be induced was main mechanism for decreased serum T3 and T4 and it increase with duration of antiepileptic drugs therapy.

Conclusion

The long term use of antiepileptic drugs therapy shows adverse effect on endocrinal system, especially thyroid functions in epileptic patients. One hundred and twenty epileptic patients were studied who had been on various antiepileptic drugs therapy for a period varying from 3 to 15 years in OPD of all clinical departments at Saraswathi Institute of Medical Sciences Hapur, Ghaziabad UP India along with sixty healthy age and sex matched nonepileptic individuals of patients relatives were selected for the study of their thyroid function served as control. Data obtained were compiled , statistically analyzed. The study found a significant decreased serum levels thyroid hormones T3, T4 in patients receiving antiepileptic drugs and it is also observed biotherapy was more likely to produce biochemical alteration of thyroid hormone level as compared with monotherapy. Thus it could be concluded that the long-term use of antiepileptic therapy significantly decreased thyroid hormone level and causes subclinical

hypothyroidism and increase with duration of therapy. This is suggested thyroid function should be regularly monitored in patients undergoing such treatment.

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Conflict of interest - None

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Impact of socio-familial factors on the morbidity of schizophrenia- A case report

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Introduction

Since the beginning of systematic outcome assessments in schizophrenia, there has been a wide consensus among researchers and clinicians that, capturing Psychopathological symptoms alone is not sufficient to reflect the longitudinal course. In order to understand schizophrenia, the social and biological factors and their mutual interaction needs to be studied (Boydell J, 2004). The uniqueness of schizophrenia prompts for a comprehensive analysis of the social factors. Schizophrenia as a disorder is persistent, affects people life long, its fluctuating course may interact with the stable social situation to give a more comprehensive picture of the disorder. The de-institutionalization concept has laid more and more emphasis on 'Training in Community Living' (TCL), propagated through the 'Programme of Assertive Community Treatment'(PACT). The concept of social cognition has received wide attention in the past five years, an improvement in the social cognition can help to improve social outcomes (Priebe S,2007).

Experience of social and physical abuse may create a biological and psychological vulnerability for developing a psychotic relapse (Bebbington PE, 2004). In a study on 'at risk' children the susceptibility to schizophrenia was lower for those who had a positive parental attachment (Schiffman, 2002). Similarly maternal loss before the age of nine years is also a vulnerability factor (Angid, 1999). Quality of life and social integration are emerging as new parameters for assessing the outcome of schizophrenia (Priebe S,2007). The social factors can be distal or proximal, their effect on the individual is less immediate than on the symptoms.

Hence improvement in the individual's condition usually takes time (Watts & Priebe, 2002) . The social factors which affect the course of schizophrenia can be 'hard' like partner, family and social framework (Priebe 2007). 'Soft' factors like creativity, compassion, companionship go a long way to make a patient more 'humanlike'. The social factors can be used to modify the outcome, which in turn can be used as a measure of the objective and subjective parameters of social satisfaction.

HIV infection has a significant correlation with schizophrenia. The report, from the Institute of Psychiatry's health services research department, claims, that in the UK 2% of people with schizophrenia are HIV positive, in comparison to 11% in the general population. The report states that the awareness about this co- morbidity is not very clear within the physician community. The patients with schizophrenia are likely to have an increased sexual activity during the early stage of the illness, lack of awareness regarding general level of issues related to hygiene and 'risky' behavior is lower in patients with schizophrenia (Mental health care'2003). The need for aggressive prevention strategies regarding HIV in schizophrenia patients cannot be undermined (Cournos et al '1994).

The circumstances of one's social incriminations do not herald the onset of mental illness, but an individual's deteriorating mental health occurs first. This statement comes in opposition to the 'drift' hypothesis of the social causation theory. In a study conducted on men aged 25-34 years, admitted to a mental hospital found that, father's occupation and social class were not related to the development of a psychotic illness(Goldberg &Morrison' 2007).However, in a meta-analysis conducted by the University of Colorado study group, support for the 'drift' hypothesis was significant (Fox et.al'1990).

The multiple variables discussed above can interact in a single case and cause significant morbidity, this observation is highlighted by the illustrated case.

Case report

A 32 year old, unmarried, Hindu female from middle socio economic class, urban background, having a masters in zoology presented with chief complaints of disturbed sleep, decreased appetite, disrupting behavior, easy irritability, talking and laughing to self, gesticulation, hearing of voices, believing that newspaper and television were referring to her, suspiciousness of being harmed by others.

The chief informant was the brother who was the functional head of the family, as the father was incapacitated by Parkinson's disease. Reportedly observable changes occurred in patient's behavior since the past ten years. The course of the disease was continuous, onset was insidious and predisposing factors were early loss of mother at age of two years, lack of family cohesiveness due to the dictatorial attitude of father. The precipitating factor was the disclosure of the fact that her functional mother was not her biological mother, the aggravating factor being the disapproval of a marriage proposal of patient's choice. Seven years ago, due to the

above factors she absconded and reached Mumbai city. Family was indifferent and did not reach for her. After reaching Mumbai she was apprehended by the Police and placed in a 'destitute home'. Once there, she started manipulating the 'guard' through physical advances and bribed her way out of the 'home'. Having fled from the 'home' she fell victim to sexual molestation on multiple occasions, as she was a destitute living on the streets. On couple of occasions in exchange for favors and to satisfy her physical urge and curiosity she became a willing partner in physical relationships. Three years ago, she contacted her family asking a testimonial for herself in order to seek employment. Her father however ignored the letter out of anger, apathy and social stigma. There was no attempt at reconciliation, nor was her brother allowed to do so. Two months before the admission the brother accidentally came to know about the patient through a common acquaintant, who spotted the patient on the street as a destitute. The brother accepted the patient into the family despite opposition from the father, neighbors and family members. Premorbidly the patient was well adjusted, talented and employed as a teacher. The personal, family and past history was not contributory.

On examination lymphadenopathy was present. Investigations revealed anemia and reactive HIV 1 & 2 (done after informed consent) on ELISA & PCR DNA, Hb level (8 gm/dl). On MSE the affect was found to be constricted and inappropriate, thought broadcasting was present; mood incongruent, delusion of persecution and delusion of grandiosity were positive; auditory hallucinations of 1st and 2nd person, commenting in nature and mood incongruent in content were present. The insight was absent (grade 0/6); the judgment was poor. A DSM IV TR Axis I diagnosis of Paranoid Schizophrenia was made keeping HIV positivism in Axis III.

The patient was put on Olanzapine 20 mg/day in divided doses. A family therapy was performed by the social worker. The parents and extended family were involved. At discharge the positive symptoms had abated and family was more cooperative. Currently the patient is regular in her follow-up in Psychiatry OPD and HIV clinic. Her past, personal and familial functioning is adequate. Occupational involvement has been achieved. The patient has been integrated into the family, and the Headship of her brother has made her an active and productive member of the family. She is currently working as a counselor in the ART centre.

Discussion

The social outcome of a patient suffering from schizophrenia has been largely studied. It is important to assess outcomes in epidemiological and clinical trials. The above case illustrates and highlights the importance of the social outcomes for understanding the longitudinal course of schizophrenia. The social factors can be used to modify the outcome and also as a measure of the objective and subjective parameters of social satisfaction .The index case emphasizes the importance of HIV co-morbidity in schizophrenia. High risk behaviors like IV drug use, homo-sexuality, multiple partners and sometimes increased sexual activity are contributory for HIV risk in schizophrenia. At times the clinician's apathy and ignorance can be fatal (Gray'2002). Younger patients of schizophrenia exchange money for sex, and have many risk factors for HIV (Cournos'1994). The index case also throws light on similar factors. The case also serves as a support for the "drift hypothesis" of schizophrenia. "Drift hypothesis" explains an individual's downward social mobility rather than a residential shift from a higher to a lower socio-economic status locality. The drift is more in terms of integration than merely a shift in terms of a house. Women are over represented in this downward drift (Fox etal'1990). In contrast to schizophrenia depressive illness involves a person's mobility to a lower status residential drift. University of Colorado study group investigated the "drift" theory by conducting a meta-analysis; their findings were in support of the above hypothesis (Fox etal '1990). The index case demonstrates interplay of various factors discussed above. The discussed case is a complex interaction of social variables responsible for the deterioration, maintainance, and ultimately management of the case. A broader management and community outreach programmes are the call of the day if the morbidity and quality of life of a schizophrenia patient have to be targeted.

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Laboratory diagnosis of HIV infection: An update

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Abstract

The number of HIV infected cases is increasing worldwide at an alarming rate. Although public education has been initiated for awareness and behavioural modification for this devastating infection, better diagnostic methods are needed to identify infected persons and manage infection. Simple and more accurate diagnostic tools have become available, particularly for early detection and to monitor treatment in those who receive anti-retroviral treatment. In this short review, we summarize some of the common and new methodologies that can be used in clinical laboratories, in the field, or in private laboratories. These range from simple antibody tests to more sophisticated methods that are used to monitor disease progression and identify drug resistance. These tools can assist physicians, medical practitioners, and laboratory personnel to select suitable diagnostic tools for the diagnosis, blood screening, monitoring of disease progression, and for detection of drug resistance to anti-retroviral therapies.

Keywords

HIV diagnosis, Enzyme Immunoassay (EIA), Polymerase chain reaction (PCR)

Introduction

Acquired Immunodeficiency Syndrome (AIDS) was first reported in the world from a group of homosexual men in North America in 1981. A couple of years later, the human immunodeficiency virus (HIV) were discovered as the causative organism leading to AIDS. Since then, HIV/AIDS has been reported from all parts of the globe with Sub Saharan Africa and parts of Asia as the worst affected areas.[1]

The Epidemic: National

Since the first detection of HIV infection in commercial sex workers in Chennai in 1986, the infection has now spread to all parts of the country. Heterosexual transmission has been found to be the commonest route of transmission accounting for 86% of total reported cases. India is standing second next to South Africa in the number of HIV infection. Sentinel surveillance data also suggest that HIV has begun to spread in several rural areas[1].

Human Immunodeficiency virus

Human immunodeficiency virus (HIV) is a lymphotropic retrovirus that primarily infects and destroys CD4+ lymphocytes. These cells are crucial for the induction and regulation of the immune response. Their progressive depletion by the virus causes irreversible disruption of normal immune function, leading to immunosuppression and the subsequent development of AIDS. Early medical intervention reduces the risk of vertically transmitted infection from mother to infant and delays progression to AIDS. This necessitates early detection of the infection, which may be asymptomatic for a prolonged time[2].

Deciding who should undergo HIV antibody screening is complex and difficult. Behaviours that increase risk of HIV infection include having many sexual partners, sharing needles during injection drug use and receiving blood or blood products prior to introduction of universal HIV antibody screening by blood banks. Barriers to obtaining accurate information may include worries about self-incrimination, illiteracy, race or ethnic background, language and socioeconomic status[3]. Screening of pregnant women is a special situation because the risk of vertical transmission to the foetus is about 30%[4].

Infection can be established by direct or indirect laboratory tests. Direct tests detect the presence of the whole virus, its proteins, or its genetic components. They include the p24 antigen capture assay, viral culture, and PCR. Indirect tests detect the presence of antibodies to HIV, thus indicating exposure to and infection by the virus. These include enzyme immunoassay (EIA) or enzyme-linked immunosorbent assay (ELISA), Western blotting (WB; immunoblotting), indirect immunofluorescence assay (IFA), and radioimmunoprecipitation assay (RIPA)[5].

Antibody (indirect) detection tests comprise screening and confirmatory (supplemental) assays which are characterized by their high degrees of sensitivity and high degrees of specificity, respectively. Screening tests include enzyme immunoassay (EIA) or enzyme-linked immunosorbent assay (ELISA) and simple and rapid tests. Confirmatory tests include Western blotting (WB; immunoblotting), indirect immunofluorescence assay (IFA), and radioimmunoprecipitation assay (RIPA)[5].

Enzyme Immunoassay (EIA) or enzyme-linked Immunosorbent assay (ELISA)

Enzyme Immunoassay (EIA) is a qualitative immunoassay characterized by easy performance, high degree of reproducibility, extreme sensitivity, adaptability to

automation, and low cost. HIV EIAs have become increasingly more sensitive and specific since HIV testing began in the early 1980s. This has shortened the 'window period', or the time from exposure to seroconversion, from up to 12 weeks or more in the early days of diagnostic testing to the current 'window period' of less than three weeks in most cases. EIAs are based on different principles: indirect, competitive and sandwich and capture assays[6].

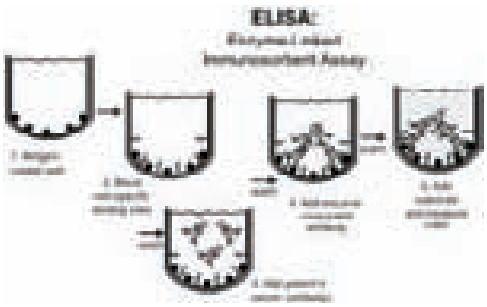
Different types of HIV kits (based on HIV Ag) available commercially

First generation of ELISA developed were very sensitive but not specific because whole viral lysates were used as antigen. These lysates usually contained small amounts of host cell components which gave rise to false positive reactions. The ELISA technologies were improved and second, third and fourth generation kits were developed using recombinant and synthetic peptides as antigen. So ELISA assays available in market may be-[1]

- First generation kits use antigen derived from detergent disruption of virus grown in human lymphocytes.
- Second generation kits use artificially derived recombinant antigens expressed from bacteria and fungi.
- Third generation kits use a chemically synthesized oligopeptides of about 15-40 amino acids (synthetic peptides).
- Fourth generation kits use a combination of recombinant and synthetic peptides and can detect both HIV Ag (p24) and antibody concurrently.

All EIAs consists of either HIV antigen or antibody (depending upon the principle) attached on a solid phase and incorporates a conjugate and substrate detection system. Viral antigen may be whole viral lysates, recombinant or synthetic peptides. The matrix can be "wells" or "strips" of a microplate, plastic beads or nitrocellulose paper. Conjugates are most often antibodies coupled to enzyme (alkaline phosphatase or horse radish peroxidase), fluorochromes or other reagents that will subsequently bring about a reaction that can be visualised[1].

The disadvantage of such a highly sensitive test is that the test produces false positive and false negative results, the number and type of which vary with the assay used and the HIV prevalence in the tested population[6].



False positive results

Enzyme Immunoassay (EIA) can produce false positive results in a number of conditions like autoimmune disorders, haematological malignancies, alcoholic hepatitis, connective tissue disorders, acute rheumatic fever, multiple pregnancies, multiple transfusions, chronic renal failure, positive rapid plasma reagin test, technical errors, etc:[1]

False negative results

Enzyme Immunoassay (EIA) can also produce false negative results in conditions like when the test is performed during the window period (up to 3 months), patient undergoing immunosuppressive therapy, replacement transfusion, B-cell dysfunction, and in cases of technical errors[1].

All HIV diagnostic laboratories must confirm repeated EIA screen-positive results by a confirmatory assay, usually with Western blot. Laboratories may choose to first test with a second EIA assay, which uses a different part of the viral antigen for antibody capture, as part of their testing algorithm. Specimens that screen positive in the first assay but negative in the second assay should still be considered for confirmatory testing if the patient is symptomatic or high risk[6].

Rapid and simple screening tests

Rapid and Simple Screening Tests (RSTs) are referred to as rapid since they can be performed in minutes instead of hours and are referred as simple because they require minimal technical skills and need no instruments and the results can be interpreted visually. They can be used as a screening alternative to conventional EIAs in developing countries, field projects, and emergency situations[7].

Rapid and Simple Screening Tests (RSTs) are qualitative tests, the majority of which are based on particle agglutination and dot blot immunoassay (tridot) principles. Agglutination tests involve the mixing of serum or whole blood with HIV antigen-coated latex, gelatin, polystyrene particles, or erythrocytes. HIV antibodies in the sample cross-link antigens on separate particles, bringing them in proximity to each other and resulting in their aggregation or agglutination[5].

In dot blot immunoassays, HIV antigens are adsorbed in a circular (dot) manner either to a membrane surface or to microparticles trapped within a membrane. Immunoassays that use microparticles, are referred to as solid-phase capture[5].

Immunoblotting or western blotting

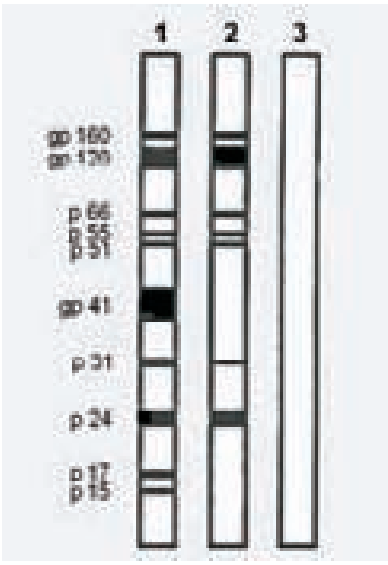
Western blotting (WB) is a qualitative immunoassay that is used to confirm the presence of antibodies to HIV in a sample that is repeatedly reactive by enzyme immunoassay (EIA). Compared with EIA, WB is more

complex, time-consuming, expensive and specific. Thus, WB is not recommended for use in screening and should only be performed sequentially with EIA on repeatedly reactive samples. WB remains a gold standard for validating screening test results and provides valuable information for the diagnosis of HIV infection[8].

Western blotting (WB) detects antibodies to HIV by using anti-human immunoglobulin enzyme conjugate and solid phase immobilized HIV proteins (antigens). In WB, the proteins are first electrophoretically separated into discrete bands according to their size and are then transferred to nitrocellulose membranes. The membranes are cut into strips and are then used to detect and identify antibodies to HIV specific proteins. Each strip serves as a solid matrix on which an indirect EIA procedure is performed. Antibodies in the sample and in the reactive controls bind their corresponding antigens on the strips, forming antigen-antibody complexes. Then, the enzyme conjugate binds to these complexes and converts a chromogenic substrate into a colored product which precipitates in situ (where the complexes are located) in the form of bands.[8]

The identity of each band is established by using the strongly reactive control strip as a reference. This strip exhibits all major protein bands encoded by the three structural genes of HIV: core proteins p55, p24, and p18 encoded by *gag*; envelope glycoproteins gp160, gp120, and gp41 encoded by *env*; and polymerase enzyme proteins p66, p51, and p31 encoded by *pol*[5].

Interpretation- On the basis of the banding pattern seen on each strip, the WB result is interpreted as positive, atypical or indeterminate (WBi), or negative. WB is negative if it exhibits no bands at all and indeterminate if the bands present do not meet the criteria for positivity. WB result is positive if it exhibits at least any two bands of p24, gp41, and gp120/160[5].



Western Blot test: Test result- test 1 is positive, test 2 is indeterminate & test 3 is negative

False positive and false negative results- Erroneous results of serial EIAs and WBs are very rare, although they do occur. A false-positive WB result has been reported in a patient with systemic lupus erythematosus[9]. False reactivity to gp41 has also been described in blood donors with no risk factor for HIV-1 infection[10].

Indirect Immunofluorescence Assay

Indirect immunofluorescence assay (IFA) is a qualitative immunoassay, and is simple, fast, and inexpensive, has sensitivity and specificity comparable to those of WB, and exhibits 100% concordance with WB. Although its major advantage is the low frequency of indeterminate results, its use is less favourable because it needs an expensive microscope, requires expertise for reading and interpreting the results[11].

In indirect immunofluorescence assay (IFA), inactivated HIV infected cells expressing HIV antigens are fixed on a slide and serve as the solid matrix. Uninfected cells fixed on the same slide serve as a negative control. The cells (infected and uninfected) are first incubated with test serum and are then incubated with a fluorescence-labeled conjugate. The pattern and intensity of the fluorescences that they exhibit are evaluated for each sample by using a UV light equipped microscope[5].

Interpretation- IFA results are interpreted as positive, negative, or indeterminate. It is positive when infected cells exhibit a specific fluorescence pattern with intensity significantly different from that of uninfected cells. Patterns indicating an indeterminate result are nonspecific and may be observed in patients with systemic lupus erythematosus, autoimmune diseases, and severe paraproteinemia[5].

Radioimmunoprecipitation

Radioimmunoprecipitation (RIPA) is a complex, expensive, and time-consuming confirmatory test whose use is restricted to specialized laboratories. It involves growing HIV infected cells in the presence of radiolabeled amino acids, lysing these cells, and incubating the sera to be tested with whole viral lysate. The antibodies in the test sera bind radiolabeled viral antigens, forming radiolabeled antigen-antibody complexes. These complexes are then immunoprecipitated and separated by electrophoresis, and the labelled proteins are detected by autoradiography[12].

p24 Antigen

p24 antigen tests are also EIA-based and use antibody to capture the disrupted p24 antigen from patient serum. Positive results that are repeatable must be confirmed with a neutralization procedure. In rare instances, the p24 antigen can be detected before HIV antibody in newly infected individuals. This test is useful for specimens from patients that are high risk and symptomatic but HIV EIA-negative, or for specimens that are EIA-positive but Western blot-negative or –indeterminate[6].

Qualitative polymerase chain reaction (PCR)

Polymerase Chain Reaction (PCR) is a method that amplifies viral nucleic acid to allow for its detection in patient specimens. It is a particularly specific and sensitive test which can pick up very small numbers of viral particles. PCR is very useful in the diagnosis of HIV infection in babies born to infected mothers. PCR may also be useful in resolving indeterminate Western blot results and testing immunocompromised individuals who may not mount an antibody response[6].

Three different techniques namely RT-PCR, nucleic acid sequence based amplification (NASBA) and branched DNA (b-DNA) assay have been employed to develop commercial kits. These kits shorten the window period between infection and detectability to about 12 days.

Laboratory diagnosis of HIV infection in newborn

Transplacental transmission of HIV can occur from infected pregnant mother to the foetus as early as 8 weeks of gestation or may be even earlier. It is estimated that > 80% of AIDS cases in infants <1 year old are due to perinatal transmission of HIV. Diagnosis of HIV infection in infants born to seropositive mothers is difficult because maternal antibody (IgG) to HIV crosses the placenta and can persist for up to 18 months, making distinction between maternal and neonatal IgG difficult.

Nuclei acid amplification testing (NAAT)

Although standard tests that measure antibody response to the HIV virus have become increasingly sensitive, cases of HIV are occasionally missed because individuals can have negative antibody tests during the early stages of infection. Also, a few people with long term HIV infection may have false negative antibody tests or may be chronic carriers who are clinically asymptomatic. The NAAT test helps avoid these problems as it amplifies the HIV viral RNA and detects viral genes instead of viral antibodies or antigens[13].

Summary

Methods for the laboratory diagnosis and monitoring of HIV infection have evolved and offer a large number and variety of effective methods that can extend the quality of life for HIV infected persons. However, many of these new methods are expensive and require technical expertise, but alternatives have become available that are suitable for many different testing venues. In India, many of these technologies are being considered and are even used in selected laboratories. Because of the estimated large number of HIV infected individuals, and the likelihood for an explosive increase in numbers over the next decade, it is critical for these methods to be considered for adoption, particularly for monitoring the response to therapy and identifying emerging viral resistance to drugs.

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Anaesthesia for immunocompromised patient

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With the advancement in diagnosis and management of many serious diseases, cancer and life threatening situations, number of such patients which come for surgery hence anaesthesia have increased. Such patients are immunocompromised hence detail knowledge of immunity, effect of immunity on anaesthesia and vicversa, plus how manage them is necessary. This review article thus is intended for discussion of immunosupressed patients who have to taken for anaesthesia. We have taken HIV & Cancer as prototype as maximum number of immunosupressed patients belong to these categories.

The immune system defends the body against invading organisms and toxins. The term immunocompromised refers to an immune system in which the ability to resist or fight infections and tumors is subnormal. Immunosuppression is a condition brought about by disease or chemotherapy that leaves an individual highly susceptible to infection. Immunosuppressed patients are immunocompromised.

Organs and tissues of the immune system

The major components of the immune system are the bone marrow, thymus, peripheral lymphoid organs and tissues, and accessory lymphoid organs and tissues.

(1) Bone Marrow: Bone marrow contains stem cells that use the process of haematopoiesis to develop into two types of cells—lymphocytes and phagocytes. Lymphocytes become either B cells that mature in the bone marrow or T cells that travel to the thymus to mature.

(2) Thymus: In the thymus, T cells undergo "education," a process in which they learn to recognize other cells. There are several types of T cells with specific functions.

a) Cytotoxic T cells are capable of killing infected somatic or tumour cells.

b) Helper T cells (ie, T4 cells) play an important role in establishing and maximizing the capabilities of the immune system.

c) Suppressor cells (ie, T8 cells) suppress activation of the immune system.

3) Peripheral lymphoid organs and tissues: Peripheral lymphoid organs and tissues consist of several structures—lymph nodes, lymphatic vessels, and the spleen. Spleen is an immunological filter of the blood. It is made up of B cells, T cells, macrophages, dendritic cells, natural killer cells, and red blood cells.

(4) Accessory lymphoid organs and tissues: The accessory lymphoid organs and tissues include the tonsils; adenoids; appendix; and Peyer's patches.

Immune system function: The immune system functions by three basic methods: the protective surface phenomenon, general host defences, and specific immune responses.

(1) The protective surface phenomenon: e.g the skin and mucus membranes provide the first line of defence against microbial invasion by preventing attachment of organisms. Lysozyme is an antibacterial substance found in tears, saliva, and nasal secretions.

(2) General host defenses

The general host defences are nonspecific cellular responses to antigens that penetrate the skin or mucus membranes. This includes: neutrophils that engulf, digest, and dispose of invaders through phagocytosis; eosinophils that multiply during allergic or parasitic disorders and also have phagocytic properties; and basophils and mast cells that have surface receptors for immunoglobin (Ig) E.

(3) Specific immune responses

Specific immune responses include humoral and cell-mediated immunity. Humoral immunity involves B cells. The five types of immunoglobulin include : IgA, IgG, IgM, IgD, and IgE. Cell-mediated immunity involves T cells. This branch of the immune system protects against bacterial viral and fungal infections and also provides a resistance to tumour cells.

Immune system malfunction

Several types of immune system malfunction may make a patient vulnerable during the surgical experience. These include-

(1) Hypersensitivity disorders: Hypersensitivity disorders include those where immune function is exaggerated, misdirected, absent, or depressed. These are classified as types I to IV with some overlap.

(2) Autoimmune disorders: The autoimmune disorders include marked or abnormal responses to one's own tissue. These patients often take immunosuppressant medications to depress their immune responses.

(3) Immunodeficiency: Immunodeficiency is caused by a variety of absent or depressed immune responses. There are 26 clinical immunodeficiency conditions including

ataxia-telangiectasia, chronic granulomatous disease etc. **The most common form however is HIV.**

(4) General populations at high risk for immune dysfunction: Infants and geriatric adults are at high risk for immune dysfunction because their immune systems may be depressed or impaired. Other high risk populations include people who

* abuse alcohol,
* are malnourished,
* are suffering from chronic pain,
* have undergone an organ transplantation procedure,
* have undergone a splenectomy, and
* have cancer.

(5) Patients on steroid therapy: People who take steroids on a regular basis tend to have a suppressed hypothalamo-pituitary adrenal axis, which can impair the stress response (to surgery and anaesthesia).

Effects of immune system malfunction on patients undergoing surgery

Surgery depresses the immune system for five to seven days postoperatively. A person who is immunocompromised is missing some or many of the components that promote wound healing and prevent infection. Surgical patients who are immunocompromised are at risk because this normal activity may be depressed and be further diminished by the surgical process or anaesthesia. The main cause of morbidity and mortality in these patients is infection. For example, pneumonia accounts for up to 40% of mortality in patients with cancer, and 35% in renal transplant recipients.

Perioperative interventions and immune mechanisms

Anaesthetic state decreases the effect of surgery on the immune response by – it obtunds the reflexes associated with pain, decreases release of stress hormones and acute phase reactants. Anaesthesia has adverse effects on non-specific defences, and adaptive and non-adaptive immune responses. E.g. anaesthesia impairs respiratory ciliary activity and tracheal mucociliary flow by endotracheal tube placement. It can decrease antigen clearance & facilitate dissemination of the microbial spread into lower respiratory tract. Anaesthetic agents also affect leukocyte function (leucopenia, bone marrow suppression and inhibition of phagocytosis, neutrophil chemotaxis and leukocyte motility).

Perioperative immunomodulation of cytokine balance

Cytokines are glycosylated and non-glycosylated polypeptides that act as the soluble messengers of the immune system. Cytokines can be of two types i.e. pro-inflammatory and anti-inflammatory.

(1) PRO-INFLAMMATORY CYTOKINES include :

- ♣ tumour necrosis factor alpha (TNFa),
- ♣ interleukin 1 – beta (IL-1b),
- ♣ interleukin –6 (IL-6) and
- ♣ INTERLEUKIN –8 (IL-8).

(2) ANTI-INFLAMMATORY CYTOKINES include:

- ♣ interleukin –10 (IL-10),
- ♣ IL-1 receptor antagonist (IL-1 RA),
- ♣ TNF binding proteins 1 and 2 (TNF-BP1 and TNF-BP 2).

The anti-inflammatory cytokines are found in plasma in appreciable quantities while the pro-inflammatory cytokines are present in plasma in very low concentrations in healthy patients.

Effect of anaesthetic agents on cytokines

Propofol-alfentanil anesthesia delays the onset and reduces the magnitude of IL-6 response during major abdominal surgery as compared with isoflurane anaesthesia. Propofol, thiopentone and ketamine have been associated with increased production of TNFa. The anti-inflammatory cytokine interleukin- 4 (IL-4) was elevated following thiopentone and Ketamine administration, and to a lesser extent following propofol. Very low concentrations in healthy patients. Propofol and thiopentone cause reduction in neutrophil polarization at clinical concentrations. Propofol and intralipid reduce neutrophil chemotaxis. Propofol inhibits neutrophil respiratory burst. Following general anaesthesia there is decrease in intra and postoperative levels of IgM, IgG and IgA antigodies. Prolonged use of high-dose thiopentone infusions in the management of head injury and status epilepticus may be associated with susceptibility to bacterial pneumonia. Propofol anaesthesia decreases helper T cells whereas thiopentone has no effect. NK-cells decrease with both drugs.

Perioperative blood transfusion and immune response

Blood transfusions can decrease in cytotoxic T cells, TNF levels and macrophage chemotaxis. This may adversely affect the prognosis and recurrence of malignancies in patients with cancer. Transfusion-induced immune-suppression has also been implicated as a cause of increased metastases.In HIV patients transfusion related immunomodulation can cause increase in HIV viral load. Blood should therefore only be transfused where unavoidable to maintain patient safety.

Two most common categories of immunosuppressed patients encountered in anaesthesia are HIV patients and cancer patients. Hereby, our discussion continues with focus on these groups.

(I) HIV and anaesthesia

HIV infects Helper T cells (CD4 T) making the host more susceptible to opportunistic infections and malignancies.

Modes of infection-sexual intercourse, mother to child transmission (during pregnancy, labour and breast feeding) contaminated blood products and organ donations and contaminated needles. HIV leads to multisystem involvement:

a) Cardiovascular system: there may be pericardial, myocardial, endocardial and vascular lesions as well as neoplasm. Common cardiovascular complications includes:

* Dilated cardiomyopathy.
* Pericardial effusion
* Endocarditis and vascular lesions.
* Vasculitis.
* Pulmonary hypertension.

b) Respiratory system: respiratory complications includes-

* Airway obstruction
* Bronchitis
* Sinusitis
* Pneumonia
* Atypical infections (tuberculosis, other mycobaterial and fungal infections)

c) Gastrointestinal system: commonly encountered complications includes-

Bleeding tendency on airway instrumentation/ nasogatric tube insertion. Diarrohea with associated electrolyte dysfunction and dehydration.

d) Renal system: cause of renal impairment includes –

* Drug induced nephrotoxicity, hypertension and diabetes.
* HIV associated nephropathy.

This necessitates avoidance of nephrotoxic drugs, dose adjustment of renally excreted drugs and need for adequate hydration.

e) Neurological system: Neurological complications mainly involves:

* Neurocognitive impirment.
* Encephalopathy.
* Autonomic neuropathy.
* Seizures.

-If regional anaesthesia is being considered then full neurological examination pre-operatively with appropriate documentation is necessary.

f) Haematological system: mainly involves

* Aneamia.
* Neutropenia.
* Thrombocytopenia.
* Persistent generalised lymphadenopathy.
* Haematological malignancies .
* Coagulation abnormalities.

Antiretroviral therapy

ARVs or highly active antiretroviral therapy (HAART) are classified into four classes according to mechanism of inhibtion of viral replication: reverse transcriptase enzyme inhibitors, protease enzyme inhibitors, integrase inhibitors and entry inhibitors. Adverse effects: they can be divided into four groups:

a) Mitochondrial dysfunction: lactic acidosis, hepatic toxicity, pancreatitis, peripheral neuropathy.
b) Metabolic abnormalities: dyslipedemia, hyperglycemia, insulin resistance, osteopenia, osteoporosis and osteonecrosis.
c) Bone marrow suppression: anaemia, neutropenia, thromboctopenia.
d) Allergic reactions: skin rashes and hypersensitivity responses.

Drug interactions

Anaesthetic drugs may affect the efficacy and toxicity of ARVs. ARVs can affect absorption, distribution, metaboism, and elimination of anaesthetic drugs. Pharmacodynamic interactions can be managed by avoiding anesthetic drugs such as halothane or methoxyflurane that causes hepatic or renal dysfunction. Propofol and NRTIs may both potentially promote mitochondrial toxicity and lactic acidosis so propofol infusion in patients receiving ARVs should be avoided.

* Opioids: the effects of fentanyl may be enhanced by ritonavir due to both liver enzyme inhibition and induction.
* Bezodiazepines: Saquinvir may inhibit midazolam metabolism.
* Calcium channel blockers: may have enhanced hypotensive effects due to enzyme inhibition.
* Local Anaesthetic: lignocaine may have increased plasma level due to enzyme inhibition.
* Neuromuscular blockers effects may be prolonged.

Perioperative management of arvs

Increasing problems of drug resistance in the treatment of HIV, it is recommended that ARV therapy be continued throughout the perioperative period if at all possible. Naturally this needs to be compatible with surgery and the patient's gastrointestinal function. Parenteral preparations are limited to zidovudine and enfuvirtide only.

Regional anaesthesia in HIV

The presence of HIV infection is not an absolute contraindication to regional anaesthesia and there is no evidence that HIV progression is increased by central neuraxial blockade. The presence of HIV complications may pose relative contraindications to regional anaesthesia such as:

- Myelopathy.
- Vertebral or spinal neoplasms.
- CNS infections.

- Coagulopathy.
  It is essential to conduct a full preoperative neurological assessment and to document any neurological deficit.

Anaesthetic management

Preoperative assessment for status of HIV infection includes:

- History, including risk factors.
- Physical examination.
- Laboratory tests.
- Assess organ involvement.
- Drug history and side effects.

Investigations should include

- Full blood count.
- Clotting function to exclude coagulation abnormalities.
- Biochemical tests.
- Viral load and CD4+ count.
- Chest radiography to screen for opportunistic infections and tuberculosis.
- Cardiac evaluation with electrocardiography and echocardiography(if possible) to screen for cardiomyopathy.

Perioperative considerations for the patient with HIV: Minimise interruptions in ARV therapy as possible to diminish drug resistance.Consider drug interactions with ARV with use of drugs affected by hepatic enzyme inhibition and/or induction.Strict aseptic technique to be exercised as HIV infected patients are immuno-compromised and are susceptible to bacterial infections. The anaesthetic plan should be tailored to the individual patient and the type of surgery as appropriate. Universal precautions should be executed for safety of theatre and personnel.

II) Cancer

Cancer results from an accumulation of mutations in genes that regulate cellular proliferation. Genes involved in carcinogenesis predisposed to cancer by altered metabolism of potentially carcinogenic components and decreased level of immune system function. Cancer cells evade the host's immune surveillance system as evident by the increased incidence of cancer in immuno-suppressed patients- HIV and organ transplant patients. Drugs administered for cancer chemotherapy produce significant side effects which have important implications for the management of anaesthesia.

Management of anaesthesia

Preoperative evaluation includes considerations of pathophysiological effects of disease such as fever, anorexia, anaemia, thrombocytopenia, neuromuscular abnormalities nephrotic syndrome, pericardial effusion, spinal cord compression etc. It also includes recognition of potential adverse effects of cancer drugs .

Preoperative tests to detect these are- Haematocrit Platelet count, WBC count, Prothrombin time (PT), Electrolytes , LFT's, RFT's, FBS, ABG.,Chest Xray, ECG.

Side effects- anticancerous drugs have serious side effects and should be known to attending anaesthesiologist. Some of these are-

A) Pulmonary and cardiac toxicity: H/O dysponea, non productive cough (drug induced pulmonary fibrosis), or CHF are important for anaesthesiologists. Patients on bleomycin should have ABG analysis in addition to oximetry and FiO2 should be kept to minimum that provides desired SpO2. Intravascular fluid replacement should be titrated carefully as these patients are at risk of developing pulmonary edema.

B) Neurotoxicity: Cisplatin causes large fiber neuropathy and subclinical neurotoxicty is present several months beyond discontinuation of treatment. Administration of LA and epinephrine in such situation can produce clinically significant injury to nerve plexus. Corticosteroids can also cause myopathy, first sign is difficulty rising from the sitting position. All patients treated with vincristine develop paresthesia which is reversible in nature.

C) Encephalopathy: cyclophosphamide 2has been associated with acute delirium. Methotrexate can lead to irreversible dementia .

Perioperative preparation: as for any other patient perioperative preparation is a must, with focus on following points-

1) Correction of underlying deficiencies such as anaemia, coagulopathy is needed.
2) Nausea and vomiting are most common side effects of anti cancer drugs and should be taken care of.
3) TCA's are useful for potentiating analgesic effects of opioids.
4) Presence of hepatic or renal dysfunction will influence the choice of anaesthetic drugs and muscle relaxants.
5) Avoid scholine if patient is on cyclophosphamide.
6) Aseptic technique is important as these patients are immonosuppressed.
7) Anaesthesia, surgical stimulation or blood transfusion may actually assist in tumour growth.
8) Tumors of head neck and chest may pose life threatening airway difficulties a good preoperative assistant to manage emergency is important. Awake fibreoptic intubation and in some patient tracheostomy may be needed.

Postoperative consideration

Postoperative mechanical ventilation may be required in prolonged operations and in drug induced pulmonary fibrosis. Patients with drug induced cardiac toxicity may have postoperative cardiac complications.

Regional anesthesia in the immunocompromised patient Advantages of Neuraxial anesthesia:

- superior analgesia,
- reduced pulmonary complications,
- decreased incidence of graft occlusion,
- and improved joint mobility after major orthopedic surgery,
- It modestly preserves cellular and humoral immune function.

Despite these benefits, patients with altered immune status are often not considered candidates for neuraxial techniques because of the risk of infection around the spinal cord or within the spinal canal. Epidural abscess increases with the duration of epidural catheterization. Long-term epidural catheterization is safe when patients are carefully monitored for signs of infection and receive prompt treatment when the diagnosis is established.

Complications of regional anaesthesia: May be infectious & non-infectious.

Non-infectious complications: There is increased risk of neurologic and hemorrhagic complications.

A) Hemorrhagic Complications: Hemorrhage can occur whenever any of the components of the coagulation cascade are sufficiently compromised.Assessment of a platelet count is advised in patients with purpura or petechiae.Neoplasm may spontaneously develop thromboembolic or hemorrhagic complications. Quantitative and qualitative platelet abnormalities are often present in the cancer patient. Hemorrhagic complications are not always correlated with platelet count. Oncologists seldom recommend platelet transfusion to avoid spinal hematoma unless the platelet count is less than 10,000/ìL, although the transfusion trigger remains controversial.

B) Neurological complications: These patients may be at increased risk for neurologic complications of regional anesthesia.The effects of needle trauma, ischemia, and local anesthetic toxicity are exaggerated . A relatively minor injury applied to a previously dysfunctional nerve may result in new (or exacerbation of existing) symptoms.

C) Vertebral column metastases: Frequent sites of bony metastasis are the vertebral column, skull, humerus, ribs, pelvis, and femur. The presence of vertebral column metastases/spinal cord compression must first be considered(not an absolute contraindication). The thoracic spine, is the most common site of bony metastasis. Patients with extension into the epidural space may develop spinal cord compression. Cancers associated with extradural compression are prostate, breast, and lung.Loss of motor function, hyperreflexia or hyporeflexia, or bowel/bladder dysfunction are suggestive of myelopathy.

D) Neuropathy after anticancer therapy: Cisplatin, suramin, taxanes (paclitaxel and docetaxel), or vinca alkaloids, commonly cause peripheral neuropathy. Vincristine is the most neurotoxic. Subclinical neuropathy is common. Carefull assessment of the risks and benefits of performing regional anesthetic techniques, should be done in patients with a recent history of chemotherapy.

Infectious complications: Infections of the CNS may result in paralysis, fatal necrotizing fasciitis or death. Group A streptococcus is most common organism cultured from blood and tissues. The source of the infection is commonly the patient's skin or proceduralist's oral pharynx.

Anesthetic management: Strict asepsis should be exercised as to reduce infectious complications. Epidemiologic series have documented the safety of neuraxial anesthesia and analgesia in the immunocompromised patient. Decision to provide neuraxial anaesthesia is based on the judgment of the responsible anesthesiologist. The risk after plexus and peripheral techniques remains undefined. Additional experience is needed to allow statements for nonneuraxial blocks.

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Quantiferon T.B. Test- A promising diagnostic tool for mycobacterium tuberculosis infection

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Key words

QFT=Quantiferon tuberculosis test in tube.

TST=Tuberculin skin test;NTM=Nontuberculous mycobacteria;IFN-"=Interferon gamma)

Introduction

Diagnosis of tuberculosis is often by exclution because of nonspecific presentation,very often sputum negativity even in infected patients,overlapping laboratory criteria with other diseases,long time taken for growth in culture media and presence of anonymous mycobacteria.But resurgence of Mycobacterium tuberculosis especially in an acquired immunodeficiency scienerio,requires prompt accurate diagnosis as far as possible for National Tuberculosis Control Program.

Quantiferon T.B test(QFT)is an innovative blood test that measures the cell mediated immune response of T.B. infected individuals.This is superior in many respects than Tuberculin Skin Test.

QFT uses specially designed(1 ml)blood collection tubes that are coated with tuberculosis specific antigens(ESAT-6,CFP-10 and TB 7.7-p4) along with a negative and a positive control tubes.

These TB-specific antigens are encoded within two regions of M.tuberculosis genome,which are detected from all BCG strains and most nonmycobacterial(NTM)species with the exception of M.kansasii,M.marinum and M.szulgai.This makes QFT highly specific for detecting M.tuberculosis infection.

Stimulation of T-lymphocytes in whole blood with these highly specific antigens results in the production of the cytokine gamma interferon(IFN-")only in individuals infected with M.tuberculosis.An enzyme linked immunosorbant assay(ELISA)is used to measure the amount of IFN-" present in each of the three tubes(NIL control;TB-antigen;Mitogen control).If the IFN gamma concentration of the TB-antigen tube is above the test cut-off,the individual is highly likely to have M.tuberculosis infection.

Materials and methods

The patients attending the O.P.D. of Midnapore Medical College were taken for this study over a span of 2 years.

Some of them were tested by TSTwhile a group of others were tested by QFT.Selection of groups were done randomly from both sexes of all age groups.These were done in addition to the other clinical and laboratory investigations like detailed clinical history,clinical examination,chest x-ray,sputum for A.F.B. detection for three consequtive days,routine blood examinations(HB,TC/DC/ESR)and special tests in specific cases(c.s.f. in T.B.meningitis and pus for A.F.B. and Culture in T.B.osteomyelitis and T.B.lymphadenitis)

The results of TST & QFT were correlated with the other modalities of diagnostic tests and response to therapy both perspectively & retrospectively especially emphasizing the specificity,sensitivity,advantages and limitations comparing TST and QFT respectively.

Results

It was found that unprecedented accuracy of QFT over the TST existed and the advantages of QFT was far near accuracy so far as the diagnosis of tuberculosis was concerned over the TST.

Discussion

QFT is commonly used in field collection especially in school health programe having NEW-IN-TUBE formet which enables remote location collection as tubes are pre-coated with antigens;tubes can be stored at room temperature;ready to use;and blood can be collected directly into tubes.There are several options after blood collection.

1. Can be sent directly to laboratory;sample must be incubated within 16 hours of blood collection.
2. Incubation and then sent to laboratory;incubated blood samples are stable for upto 3 days at room temperature.

In-lab. Test procedure

Single whole blood test-no cell isolation

Table 1:

Tuberculin Skin Test	Specificity	Sensitivity
(5 mm sensitivity cut-off	65.9%	76%
15 mm for specificity	(n=672)	(n=79)
Quantiferon TB in Tube Test	99.2%	89%
	(N=383)	(N=177)

Table 2:

Limitations of TST	Advantages of QFT
Requires two visits	Requires only one visit.
Affected by previous BCG vaccination.	Unaffected by BCG VACCINATION.
False positive responses due to non-tuberculous mycobacterial infection.	Unaffected by non tuberculous mycobacteria.
Test reading is subjective	Test reading is objective-yes or no an swer
Serial screeningprograms require 2 step testing Upto 4 visit	Avoid boosting.

Lab. Testing requires little specialized equipment and minimal additional labour requirements,

Enables large volume testing as compatible with existing ELISA systems.

QFT is cost effective for TB infection control programs, because;-

Requires only one visit.

High sensivity & specificity compared to TST .

Reduction in personel cost , a major cost in TST programe.

Reduction in additional investigation cost like chestx-ray.

QFT is an in vitro diagnostic testusing a peptide cocktail simulating ESAT-6, CFP-10 & T.B.7.7(p4) proteins to stimulate cells in heparinised whole blood. It is recommended by US-FDA. Detection of interferon gamma by ELISA used to identify in vitro response to these peptide antigensthat are associated with M. tuberculosis infection.

It is an indirect test for M. tuberculosis infection(including disease)and is intended for use in conjuction with risk assessment, radiograph and other medical & diagnostic evaluation.

Summary

Above study reveals QFT as a better tool for detecting the M.tuberculosis infection in respect of administrative, usage, specificity and sensitivity over and above the tuberculin skin test.

Conclution

Diagnosis of tuberculous infection should be accurate not only for the cost of treatment but also for the control and eradication of this gnaging disease. QFT is a quiet reliable tool to fight against this disease.

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Anaesthetic management of intracranial A-V malformation for emergency caesarean section: A case report

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Summary

Brain Arteriovenous malformations (AVM) are rare. Each year 1.3 people out of 1,00,000 have an AVM detected. Brain AVMs can present as spontaneous haemorrhage (30-82%), seizures (16-53%), headache (7-48%) or neurological deficit (1-40%). The risk of spontaneous haemorrhage is 2-4% per year and the risk of rebleeding is 6% in the year after the first haemorrhage.

Inspite of the rare nature of disease, it is of immense clinical significance because each episode of haemorrhage is associated with a 1-15% mortality rate and 20-30% rate of permanent neurological deficit. Surgery and anaesthesia in a patient who already had an episode of bleeding carries high risk. Here we present a case of 29years pregnant female, a diagnosed case of AVM, who had to be taken for immediate caesarean section.

Introduction

The term "AV Malformation" refers to a collection of abnormal cerebral blood vessels comprising of feeding arteries, draining veins and an intervening collection of abnormal vessels called "the nidus". The vessels of nidus on histological examination reveals an ambiguous wall structure best described as arterialized vein, simply shunting blood to collecting veins. In 77% of the cases the core or nidus of a compact AV malformation is 2-6cm diameter[1].

Demography

Patients are more frequently diagnosed in the 3rd and 4th decade and the rates for men and women are equal[2]. No consistent racial or familial association has been reported but anecdotally, AVMs are considered more frequent in Chinese than Japanese Asians and case reports of affected families have been reported[3].

Natural history and presentation

AVMs can be found throughout the central Nervous System. They may be microscopic or large enough to involve an entire hemisphere of the brain. Most AVMs are small (2-4cm in 42% of cases) or moderately sized (4-6cms in 35% of cases). 90% of AVMs are supratentorial and they tend to occur in watershed areas (straddling more than one vascular territory). 75% of supratentorial AVMs are purely pial, with no. of lesions are purely dural or pial-dural mix. Approximately one half of posterior fossa AVMs are purely dural or pial-dural mix.

The symptoms of an AVM may include headache, weakness, numbness, visual problems or more often, the abrupt onset of stroke. Usually AVMs are initially silent, subsequently becoming symptomatic in the 2nd, 3rd or 4th decade of life. A headache indistinguishable from migraine may occur ipsilateral to an unruptured AVM. The coexistence of migraine and seizures is particularly suggestive of vascular malformations. Dural AVMs of the sigmoid or cavernous sinus also produce migraine like episodic headaches or pulsatile tinnitus.

Symptoms at first diagnosis[4]

1.	Spontaneous haemorrhage	30-82%
2.	Seizures	16-53%
3.	Headache	7-48%
4.	Neurological deficit(all)	1-40%
5.	Progressive neurological deficit	4-8%

Imaging Features[5]

1. High density on CT.
2. Serpiginous enhancement.
3. Signal void on MR
4. Calcificaition
5. Minimal edema and mass effect.
6. Associated haemorrhage
7. Angiography for therapeutic planning.

A spin echo imaging is probably more sensitive than MRA for detecting AV malformations.

Case report

We present a case of a 29years old female who reported in the gynaecology department of SPMC, Bikaner, with 38 week pregnancy and labour pains. She was referred from a Primary health centre as she was a diagnosed case of brain AVM.

She has had an episode of stroke 11 months back. During that episode she complained of severe headache followed by vomiting and developed left side hemiparesis. She was hospitalized and treated conservatively in the neurosurgery department of PBM. It was at that time that she was diagnosed of having a brain AVM which had bled leading to symptoms. Since then she was on anti-epileptic medication (phenobarbitone).

4months back she again had complaint of severe headache for which she was hospitalized & a repeat MRI was done. Patient responded to conservative management.

The patient was from rural background, hence was not consulting obstetrician. She reported to the hospital with mild labour pains. In the untreated patient with an AVM, the best mode of delivery remains debatable with most obstetricians preferring a caesarean section in order to avoid valsalva manoeuvres associated with vaginal delivery[6]. She was immediately planned for caesarean section after neurosurgeon's opinion.

The main anaesthetic considerations were: firstly the patient was a diagnosed case of AVM & had suffered an episode of intracranial haemorrhage less than a year ago. She had suffered an episode of severe headache and re-hospitalization 4months back. Hence the chances of rebleeding were increased. So, the patient had to be taken for immediate caesarean section to avoid straining during labour. Secondly the patient was full stomach as she had taken milk and biscuits 4hours before but case could not be postponed to achieve 6hrs fasting.

The mainline of management was to avoid any sympathetic stimulation during perioperative period. Spinal anaesthesia was avoided for obvious reasons as the patient was a known case of brain AVM with history of stroke.

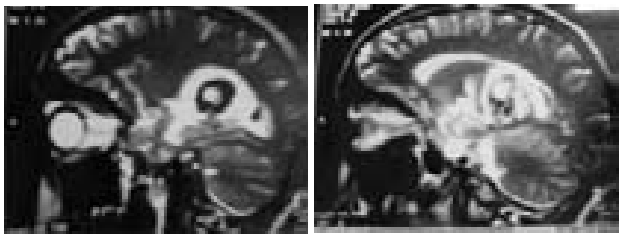
High risk consent was taken from patient and her relatives. The patient was immediately premedicated with metoclopramide, ranitidine and glycopyrrolate. A particulate free antacid was given orally. Opiod (fentanyl 50µg i.v.) was given to blunt reflexes and paediatrician was informed about it.

Patients preoperative vitals were: conscious , oriented to time place & person. Pulse rate-90/min, B.P.:100/60mmHg, Hb-9gm%, B.T.-3'10", C.T.-5'40", platelets-73,000/mm3, P.T.-15sec(control value-16 sec), BU-33mg%, S.Cr.-1.0mg%, S.bilirubin-total:0.6mg/dl, direct:0.2mg/dl, weight-45kg.

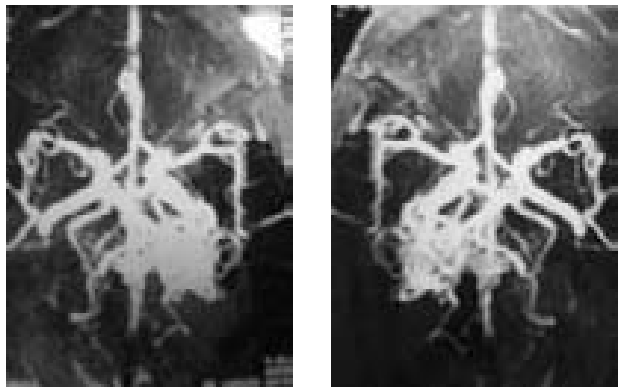
MRI-multiple tortous vascular flow voids in atrium of left lateral ventricle and adjacent left thalamus, midbrain, left temporo-occipital lobes and peri-mesencephalic and adjacent basal cisterns with dilated draining veins and left posterior cerebral artery s/o AVM.

MR Angiography

Multiple abnormal tortous vessels in left lateral ventricle and adjacent left thalamus, temporo-occipital lobes and mesencephalic and adjacent basal cisterns with feeder arteries arising mainly from left PCA, left posterior communicating, left superior cerebellar arteries and choroidal branches and draining vein draining into internal cerebral vein and tributaries of vein of galen s/O AVM.



Patient's MRI



Magnetic Resonance Angiography

After painting and draping was done, patient was undertaken for crash induction as patient was full stomach. Pre-oxygenation was done for 5min. Intravenous induction was done using 90mg propofol i.v. As soon as patient lost consciousness, cricoid pressure was applied. Since succinylcholine was to be avoided (to prevent increase in intracranial tension and chance of recurrence of intracranial haemorrhage), rocuronium 40mg i.v. was given intravenously. No positive pressure was given for ventilation. After disappearance of response to TOF patient was intubated with portex cuffed endotracheal tube no.7. Cuff was immediately inflated. Baby was taken out in approximately 3min. APGAR SCORE at 1 and 5 minutes was 9 & 10 respectively.

Maintenance was done with intravenous infusion of propofol at the rate of 100µg/kg/min. The patient was mechanically ventilated to maintain mild hypocapnia (EtCO2 approx 34mmHg). Throughout the operative period the systolic blood pressure was maintained in the range of 90-110mmHg and pulse rate varied between 70-90/min.

Monitoring

Non-invasive B.P., Pulse oximetry, EtCO2, ECG, Temperature, and Peripheral Nerve Stimulator.

During closure of peritoneum propofol infusion was discontinued and epsolin 300mg was injected i.v. slowly. Neuromuscular blockade was reversed using 2.5mg neostigmine and 0.4mg glycopyrrolate, when TOF ratio was 0.25. After respiration became regular and TOF ratio of 0.95, deep extubation was done to avoid any straining and rise in blood pressure. TOF ratio was observed in order to keep emergence smooth. Patient was oxygenated with mask till she became fully conscious. Patient had an uneventful recovery.

She was monitored in the post-operaive ward. At 4hrs

patient was fully conscious, pulse rate-80/min, B.P.-106/70mm Hg, thoracoabdominal pattern of respiration, and SpO2-99% without any oxygen supplementation. Neurological examinaition showed no deficit.

At 24 hrs post-operatively, again neurological examination was carried out and found to be normal. Patient was fully conscious with pulse rate-80/min, B.P. 110/70mm Hg.

Discussion

Brain AVMs are rare. Early description of this type of brain lesions are confused because authors frequently used different terms. Steinheil is credited with the first description in 1895. In the surgical literature, Cushing and Bailey clearly identified the gross pathological features of BAVM[6].

The introduction of angiography finally allowed the pre-operative in vivo diagnosis and more complete description[7].

The clinical importance of AVMs lie in its association with increased morbidity and mortality. They can present as stroke, headache, seizures or neurological deficit. The cumulative lifetime risk that an intracranial AVM will eventually bleed is estimated to be 50%. Haemorrhage more likely to be intracranial or intraventricular rather than purely subarachnoid.

- The risk of spontaneous haemorrhage is 2-4% per year. Each episode has a 10-15% rate of mortality and a 20-30% rate of permanent neurological deficit.
- In the year after the first episode of intracranial haemorrhage, the risk of rebleeding is 6%, thereafter it decreases to 2-4%. Overall haemorrhage is implicated in 29% of patient deaths[8,9,10].

Through an analysis of risk factors, Spetzler and Martin published a grading scale based upon 3 risk factors 1.size of the AVM, 2.Presence of Deep draining veins, 3.position of nidus in so called "eloquent" brain (brain with functional importance).

Spetzler and Martin Avm Operative Risk Grading[11]

Risk Factors		Scores
Size	0-3	1
	3-6	2
	>6	3
Position	Silent	0
	Eloquent	1
Veins	Superficial	0
	Deep	1

Grade = size score + position score + draining vein score.

As a general rule, grade I, I, II AVMs can be operated with an acceptable risk of complications (compared with the natural history of untreated AVM).

Patient with a score of >3 have a high risk of complication and many surgeons recommend non-surgical management.

Small AVMs can be obliterated non-invasively with radiosurgery. 70-90% of AVMs obliterate over 1-3 years period after radiotherapy.

Whether pregnancy is a risk factor for hemorrhage from AVMs is controversial[12]. An earlier study showed it carries 87% risk of hemorrhage, with poor outcome of baby in subsequent pregnancy if the

AVM is untreated[13]. However, a more recent study found that the risk of first hemorrhage for pregnant women with an unruptured AVM was only 3.5%, similar to the known annual bleeding rate in the non-gravid population with an unruptured AVM[14].

Our patient comes to stand in grade 4 as the size of AVM was 3-6cm (score 2), its position eloquent (score 1) & draining into deep veins (score 1).[Courtesy : Dr. L.N.Agarwal, retired Prof. Neurosurgery Department, P.B.M., Bikaner)

The choice of the anaesthetic technique for caesarean section is influenced by the need to maintain a stable cardiovascular system and is decided on a case-to-case basis. The fundamental aim of anaesthesia is to maintain adequate oxygenation & stable systemic, cerebral and placental haemodynamics. Taking into account the fact that general anaesthesia provides stricter control of haemodynamics and anxiety, thereby avoiding rise in intracranial tension and avoids sudden hypotension associated with neuraxial blockade which can cause cerebral hypoperfusion, we chose general anaesthesia for our patient. We maintained both the intra-cranial pressure and the uteroplacental perfusion at appropriate levels by keeping the mean arterial pressure within certain limits using propofol infusion and fentanyl. Fentanyl is a synthetic opiate with evident advantages for various anaesthetic techniques, enhancing the quality of anaesthesia and hence improves haemodynamic stability.

Intermittent injection of nicardipine can be quite effective to control the hypertension during anesthesia as demonstrated by Terao M et al.[15] Alternatively, intravenous lidocaine and inhaled sevoflurane prior to tracheal intubation, and a bolus dose of nicardipine prior to tracheal extubation can be used to avoid hemodynamic changes and increasing intracranial pressure as done in a case study by Sotome K et al.[16]

Epidural anaesthesia can be a valid alternative to general anaesthesia as it provides excellent analgesia allowing an accurate assessment of the neurological conditions of the mother and avoiding opioids and/or hypotensive drugs, potentially dangerous to the foetus, to blunt the hypertensive response to intubation. The accidental dural puncture is to be avoided with extra-careful technique. The epidural injection must be made either very slowly or with an incremental technique to avoid any increase in

intracranial pressure. Hypotension must be corrected promptly to maintain cerebral perfusion pressure[17].

Better perinatal outcome is expected when AVM re-rupture is prevented by first performing caesarean section[18].

Conclusion

General anaesthesia as well as regional anaesthesia has been used for caesarean section in parturient with AVM. When choosing a technique for anaesthesia, the risks & benefits of general anaesthesia and central neuraxial blockade have to be carefully considered. The choice should be influenced by need to maintain a stable CVS & to prevent any further increase in intracranial pressure.

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Multiple jejunal diverticula associated with volvulus: A case report

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Abstract

Jejunal diverticula are a rare entity and are usually asymptomatic. Symptoms presented by the patient of jejunal diverticula reflect its associated complications. These complications may be of acute or chronic in nature. Since it is a rare entity, the diagnosis is usually delayed, resulting in unnecessary morbidity and mortality. We are presenting an interesting case of multiple jejunal diverticula associated with its volvulus.

Keywords

Multiple jejunal diverticula, Jejunal volvulus, Acute intestinal Obstruction

Introduction

Multiple diverticula of the foregut are an uncommon entity[1] and the reported prevalence of jejunal diverticula in autopsy study is only about 1%[2]. In majority of cases diverticula of small intestine are asymptomatic; presentation of this clinical entity is because of its complication. Eckhauser and associates estimated its complications rate in between 6% to 10%[3]. We are reporting a rare and interesting case of an elderly male with upper GI obstruction diagnosed clinically and radiologically. He underwent exploratory laparotomy, which revealed volvulus of jejunum with grossly dilated jejunal loops and with multiple diverticula on the mesenteric side with gangrenous changes.

Case history

A 55 years old male was admitted, in emergency with complains of absolute constipation, abdominal pain and bilious vomiting, in a dehydrated state. On examination, a central abdominal distension with tenderness was felt. Tympanic note was elicited near epigastrium with no shifting dullness or fluid thrill. Patient was initially resuscitated then investigated. The hematological and biochemical profile were deranged and a large tyre shaped distended loop of intestine with air fluid level was noticed on plain x-ray abdomen in erect posture (fig-1). Exploratory laparotomy was planned. At laparotomy, a 180 degree clockwise volvulus of jejunum about 25-30 cms distal to ligament of Treitz with sign of gangrene was found (fig-2). The volvulus was de rotated and gangrenous segment was resected, and end to end anastomosis was performed. The

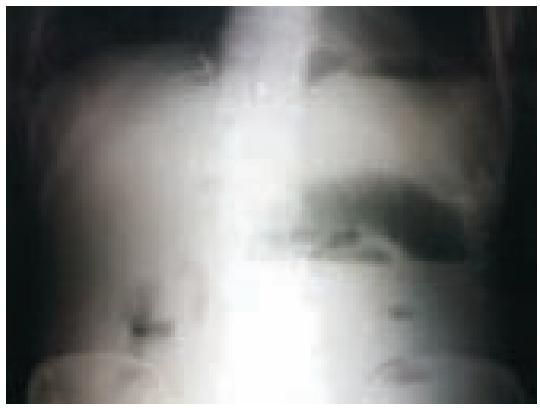

Fig. 1: X-ray Abdomen Showing Multiple Air Fluid Level.

histopathology of resected segment of jejunum showed multiple jejunal diverticula on mesenteric side with gangrenous changes (fig-3).

Discussion

Small bowel divetriculosis represents an uncommon disorder except for Meckel's diverticulum[4]. The etiology of this condition is not known and is believed to develop as a result of abnormalities in peristalsis, intestinal dyskinesis and high segmental intra luminal pressure[5]. Acquired divericula, colon being common site, normally seen at the point at entry of the blood vessels into intestine, is composed of all layers of intestine[6]. As most of these diverticula are asymptomatic, it is very difficult to assess the actual incidence; although duodenal diverticula are approximately 5 times more common than jejunoileal

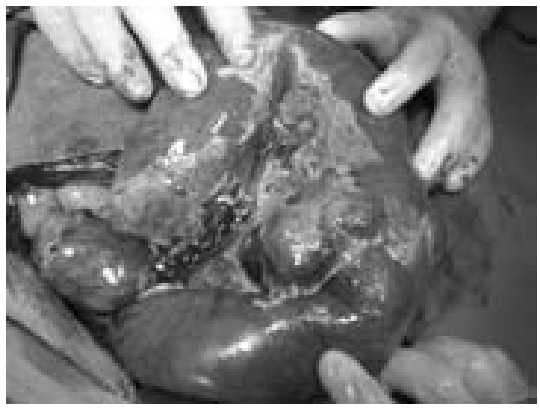

Fig. 2: Showing distended bowel loops with multiple volvulus.

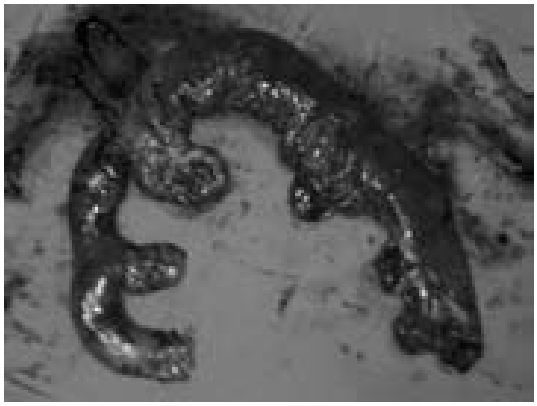

Fig. 3: Ressected specimen showing multiple jejunal volvulus

diverticula. The incidence of jejunal diverticula is less than 2.5% on upper GI radiograph, whereas on autopsy, it is in between 0.03% to 1.3%[1].

Small bowel diverticula are generally asymptomatic except for Meckel's diverticulum. Usually the diagnosis is made because of its complications like malabsorption, diverticulitis, haemorrhage, perforation or obstruction. When obstruction does occur, it is usually due to enterolith formation not due to volvulus[7]. The intestinal obstruction due to diverticula is cited as a less common complication with estimated incidence of 5% and only 27 cases of this content is described in modern literature[8]. The low incidence of small bowel obstruction due to diverticula is because of liquid state of food in the small intestine. Regarding the etiology of formation of volvulus, it had been suggested that diverticula bearing segment becomes heavier due to its content and this contributes to the formation of volvulus. Another factor is the semisolid contents of jejunum consisting of roughage, millets and cereals in the staple diet. These two factors are the probable etiology of the formation of volvulus[9].

In this case we diagnosed the patient pre operatively as acute intestinal obstruction with suspicion of small bowel volvulus. The diagnosis of diverticula was confirmed only after laparotomy. The patient might have vague symptoms earlier, no body consider the probability of diverticula. Because of non specific symptoms, the diagnosis of intestinal diverticula is often very difficult to make pre operatively, leading to increase morbidity and mortality[10].

Conclusion

Small bowel Obstruction is a common cause of emergency surgical admission. Awareness of the fact that volvulus of the diverticula bearing segment of the jejunum is a rare cause of small bowel obstruction, may lead to early and prompt diagnosis and surgical intervention in time, in order to prevent vascular compromise of affected segment of bowel.

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Socio-demographic profile and risk factors of HIV/AIDS among elderly in Varanasi, India

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Abstract

Acquired immune deficiency syndrome (AIDS) virus was originated in Africa during 1959-1960. The first AIDS case was detected in 1981 in USA. Now this has become a global epidemic. The first human immune deficiency virus (HIV) infected case was detected in India in 1986 in a sex worker of Chennai (Tamil Nadu). By the end of 2008, the estimated number of HIV infects were 2.5 million in India. Presence of HIV infection in each region of the country highlights the spread of infection from urban to rural i.e. from the high risk to the general population and from the permissive to conservative societies. The spread is mainly caused by the migrants, especially, of lower literacy level. Most of the transmission of disease is horizontal. This study aims to assess the sero-positivity rate of HIV infection among clinically suspected subjects of elderly people (e"50 yrs) as per biological and behavioral characteristics. The differentials of the sero-positivity rate for the symptoms of morbidity are also evaluated.

Material and method

The data for this study was collected from Integrated Counseling and Testing Centre (ICTC), Department of microbiology, IMS, BHU, Varanasi during the period from September, 2006 to August, 2007. 2-3 ml blood sample was taken in a plain vial and HIV testing was done by following strategy-II/III guidelines of WHO-NACO. c2 test and binary logistic regression analysis were used.

Result

The overall sero-positivity rate among the elderly people was 34.2%. The sero-positivity rate was 37.8% and 28.9% among males and females and difference observed was statistically significant ($p<0.05$). Respondents belonging to widow had significant experienced more sero-positivity than other groups. The occupational group, residential status, education, income, history of migration, and history of multiple sexual partners was statistically highly significant w.r.t seropositivity ($p<0.001$). The symptoms of morbidity like fever, weight loss, weakness, loose motion, cough, anorexia, tuberculosis, other co-morbidities (skin infections, gynecological problem, lymph node and neurological problem) and STD were observed statistically highly significant($p<0.001$).

Conclusion

The findings indicate a high sero-positivity among both the genders. Multiple heterosexual contacts, especially, in migrants are the main root of transmission of HIV. These are causing spread of HIV to their spouses. The multiple sexual contacts in the society, especially, among non migrant females of this region are indicating the distortion of traditions and cultures which are a serious concern and may lead to HIV infection on the rise. Awareness program to the susceptible group is the need to reduce further spread of HIV.

Key words

Migration, Multiple sexual contacts, Sero-positivity, Heterosexual, HIV, AIDS, Reproductive, Apparently healthy

Introduction

HIV/AIDS has exceeded all expectations since its identification. Globally, nearly 33.4 million people are currently living with HIV and about 25 million people have already died with the worst of the epidemic centered on Sub-Saharan Africa(UNAIDS, Nov 2009). The spread of HIV has been observed greater than predicted, thus, it has put its impact on social capital, population structure and economic growth. Responding to AIDS nothing less than a sustained social mobilization is necessary to combat one of the most serious crises facing human development (Piot *et al*., 2001).

In India with population over one billion, around half are in the sexually active age group (15-49 years). The first HIV/AIDS case in ASIA was detected in 1985 in Thailand and subsequently in 1986 in India (Chennai) in a commercial sex worker (Simos *et al*., 1987). Since then HIV infection has been reported in all states and Union Territories of India. As on 6 July 2007, UNAIDS/ NACO/ WHO estimates in National Household Survey data, around 2.3 million people were living with HIV. India is still facing a wide spread of poverty, illiteracy, social inequalities, poor nutritional and health status, high prevalence of sexually transmitted diseases (STD) & reproductive tract infections (RTI), and virtual lack of public hygiene. Furthermore, the epidemiology of HIV is complicated in India because of high labor migration and mobility in search of employment from economically backward to advanced region. Information drawn from different studies showed that

during heterosexual sex, women compared to men are at two fold risks to get HIV infection (UNICEF, 2005). Poor perception of safe sex and still a persistent denial about AIDS in many states makes India vulnerable to the overwhelming AIDS epidemic (NACO specialists training and reference modules, 2002-03).

Study conducted in Ludhiana (Punjab, 2007) in a specific population group had shown 0.3% prevalence of HIV in general population, 0.12% in blood donors, and nil in pregnant women. The subjects were deficient in knowledge about the modes of spread of HIV/AIDS. Sexually active unmarried young (15-24 years), those including in extra-poppy-husk were at higher risk of HIV infection (Benjamin *et al*., 2007). In 1999-2000, the overall sero-positivity among patients attending SS Hospital of BHU (from eastern U.P., Western Bihar and M.P.) was 3.17% (6.42% in high risk group and 0.37% in low risk group (Mukhopadhyay *et al*., 2001). Pune study (1996) reported overall prevalence of HIV-1 infections as 21.2% and being higher in females (32.3%) than in males (19.3%). Higher HIV-1 sero-prevalence was associated with behavioral and biological characteristics e.g. sex work, life time number of sexual partners, receptive anal sex, lack of circumcision, genital diseases, and lack of formal education (Mahendale et al., 1996). In south India 81% housewives among 135 detected HIV positives indicates the husbands probably are the main source of infection (Newmann *et al*., 2000; George *et al*., 1997). Thus, transmission via sex workers, long distance truck drivers and the HRG groups has now extended the epidemic into general population who might have been considered to be at low risk of HIV infection, apart from being in a marital sexual relationship (Singh and Malaviya, 1994; Rao et al., 1999; Bryan et al., 2001; Venkataramans and Sarada,2001). The present study was undertaken with the following objectives:

- To assess the sero-positivity rate of HIV infection in clinically suspected study subjects
- To find the significant risk factors associated with HIV infections among elderly people
- To assess the differentials of symptoms of morbidity among the elderly people

Material & method

Prospective data for this study was collected from Integrated Counseling and Testing Centre (ICTC), Department of microbiology, IMS, BHU, Varanasi during the period from September, 2006 to August, 2007.The subjects screened were either the suspects referred by various OPD's of Sir Sunderlal Hospital, a teaching hospital of BHU or who came voluntarily to know their HIV status. Mostly screened subjects were from eastern Uttar Pradesh, Western Bihar, Madhya Pradesh and Jharkhand. About 2-3 ml. of blood samples was collected in a plain vial. All the samples of symptomatic and asymptomatic subjects were tested for HIV positivity using strategy II/III as per WHO/ NACO guidelines. The study is based on 473 elderly people (e"50 years).

Statistical analysis

To find out the association of risk behavior factors and significant factors of HIV/AIDS, risk behavior with different morbidities/symptoms and HIV infections, data were analyzed by using Statistical Package for Social Science (SPSS). All the data were cross-tabulated and their Odds Ratio (OR) and 95% confidence interval (CI) was calculated. The non-parametric technique c2-test was used to test the significance of the data. To assess independent relations, Binary logistic regression analysis was performed.

Result

Table-1 illustrates the seropositivity rates among the study subjects in the age-group e"50 years according to their biological characteristics. The seropositivity rate was 37.8% and 28.9% among males and females and the difference observed was statistically significant ($p<0.05$). The seropositivity was higher among the subjects residing in rural areas (40.2%) than urban areas (19.3%) and the difference observed statistically highly significant ($p<0.001$). Higher seropositivity was observed among the widows (67.5%) than married subjects (32.4%). Zero prevalence was observed among widower. The marital status group was highly associated with seropositivity ($p<0.001$). The seropositivity rate was 35.2%, 22.4%, 47.6%, 81.0% and 10.5% among uneducated, up to primary, up to high school, up to Intermediate and up to graduation & above subjects respectively and the educational status was highly associated with seropositivity ($p<0.001$). None of the unemployed were seropositive whereas highest seropositivity was observed among the private sector employees (64.3%). Nearly one-third of the daily wages and housewives were seropositive. Half of the truck drivers were seropositive. The seropositivity was 14.5%, 45.5%, 31.8% and 22.6% among farmers, government employees, businessman and retired personnel respectively. The seropositivity status among the elderly person according to their occupation was statistically highly significant ($p<0.001$). The seropositivity was higher among middle income group (45.1%) and minimum among high income group (24.1%). More than one-third of low income group were seropositive and the difference observed among them was statistically highly significant ($p<0.001$).

The distribution of seropositivity rates among elderly group according to their behavioral characteristics are shown in table-2. The seropositivity rate was 58.2% among migrants and 17.3% among non-migrants and the difference observed was statistically highly significant ($p<0.001$). 73.9% seropositivity was observed among subjects having history of multiple sexual contacts whereas only 17.9% among the subjects who do not have any such history. The seropositivity was 100.0% among the drug users whereas one-third seropositive subjects were non-drug user and the difference observed among them was statistically highly significant ($p<0.001$). The seropositivity was higher in nuclear family (36.5%) than joint family

Table 1: Distribution of seropositivity rates among subjects in the age-group 50 & above with respect to their biological characteristics.

Biological Characteristics		HIV status		Total N (%)	χ^2/ P-value
		Positive N (%)	Negative N (%)		
Gender	Male	108(37.8)	178(62.2)	286(60.5)	3.96
	Female	54(28.9)	133(71.1)	187(39.5)	P<0.05
Residential status	Urban	26(19.3)	109(80.7)	135(28.5)	18.85
	Rural	136(40.2)	202(59.8)	338(71.5)	P<0.001
Marital Status	Married	135(32.4)	282(67.6)	417(88.2)	28.63
	Widow	27(67.5)	13(32.5)	40(8.5)	P<0.001
	Widower	0(0.0)	16(100.0)	16(3.3)	
EducationalStatus	Uneducated	38(35.2)	70(64.8)	108(22.8)	76.68
	Primary	34(22.4)	118(77.6)	152(32.1)	P<0.001
	High school	49(47.6)	54(52.4)	103(21.8)	
	Intermediate	34(81.0)	8(19.0)	42(8.9)	
	Graduation & above	7(10.5)	61(89.5)	67(14.4)	
*Occupation	House wife	54(32.5)	112(67.5)	166(35.1)	34.54
	Farmer	9(14.5)	53(85.5)	62(13.1)	P<0.001
	Daily wages	7(33.3)	14(66.7)	21(4.4)	
	Govt. service	46(45.5)	55(54.5)	101(21.4)	
	Pvt. Service	18(64.3)	10(35.7)	28(5.9)	
	Business	14(31.8)	30(68.2)	44(9.3)	
	Retired	7(22.6)	24(77.4)	31(6.6)	
	Truck driver	7(50.0)	7(50.0)	14(3.0)	
Income status	<=5000	89(34.4)	170(65.6)	259(54.7)	10.45
	5001-10000	46(45.1)	56(54.9)	102(21.6)	P<0.05
	> 10000	27(24.1)	85(75.9)	112(23.7)	
Total	162(34.2)	311(65.8)	473		

*6 unemployed study subjects were excluded from the study

(29.8%) and family type was not statistically associated with seropositivity (p>0.05). The seropositivity was 43.6% among the subject with d"3 children in their family whereas 20.4% seropositivity was observed among the subjects with 4 & above children in their family and the difference observed was statistically highly significant (p<0.001). 30.7% seropositivity was observed among the subjects having history of hospitalization whereas 37.9% seropositive subject were not hospitalized in their life and the difference observed was not significant (p>0.05). The seropositivity was 30.1% among the subjects having 0-10 sexual partners in their lifetime whereas cent-percent seropositivity was observed among the subjects with 11-20 and >20 sexual partners during their lifetime and the difference observed was statistically highly significant (p<0.001). 100% seropositivity was observed among the subjects who voluntarily came for knowing their HIV status at ICTC, Department of Microbiology, Institute of Medical Sciences, Banaras Hindu University, Varanasi, whereas 31.3% seropositivity was observed among the subjects referred by consultants of different OPDs of SS Hospital, Banaras Hindu University, and the difference observed was statistically highly significant (p<0.001). 100.0% seropositivity was observed among the subjects who had HIV transmission through blood transfusion; heterosexual contact and both blood transfusion & heterosexual contact. The main mode of transmission of HIV infections among the elderly people was heterosexual contact and none of them had used any contraceptive method during their heterosexual contact.

In table 3, Binary logistic model has been applied to explore the influences of significant predictors. The dependent variable, HIV status (sero-positive or sero-negative), assume one, if a respondent had been sero-positive and zero if non sero-negative. The subjects suffering from fever had 5.92 times more risk of acquiring HIV infections than who do not. Their 95% CI was 3.86-9.10. The seropositivity was 8.31 times higher among the subjects who had weight loss than

Table 2: Distribution of seropositivity rates among subjects in the age-group 50 & above with respect to their behavioral characteristics.

Behavioral characteristics		HIV status		Total N (%)	χ^2/ P-value
		Positive N (%)	Negative N (%)		
History of Migration	Yes	114(58.2)	82(41.8)	196(41.4)	84.99
	No	48(17.3)	229(82.7)	277(58.6)	P<0.001
History of multiple sex	Yes	102(73.9)	36(26.1)	138(29.2)	136.1
	No	60(17.9)	275(82.1)	335(70.8)	P<0.001
History of Drug addiction	Yes	7(100.0)	0(0.0)	7(1.5)	NA
	No	155(33.3)	311(66.7)	466(98.5)	
History of drinking alcohol	Yes	95(59.0)	66(41.0)	161(34.0)	66.43
	No	67(21.5)	245(78.5)	312(66.0)	P<0.001
Family type	Nuclear	114(36.5)	198(63.5)	312(66.0)	2.13
	Joint	48(29.8)	113(70.2)	161(34.0)	P>0.05
Number of children in family	0-3	123(43.6)	159(56.4)	282(59.6)	27.21
	4 & above	39(20.4)	152(79.6)	191(40.4)	P<0.001
History of hospitalization	Yes	74(30.7)	167(69.3)	241(51.0)	2.74
	No	88(37.9)	144(62.1)	232(49.0)	P>0.05
Number of sexual partners	0-10	134(30.1)	311(69.9)	445(94.1)	NA
	11-20	21(100.0)	0(0.0)	21(4.4)	
	>= 21	7(100.0)	0(0.0)	7(1.5)	
Advice for HIV test	Doctor	142(31.3)	311(68.7)	453(95.8)	NA
	Self	20(100.0)	0(0.0)	20(4.2)	
Mode of transmission	Blood transfusion	19(100.0)	0(0.0)	19(11.7)	NA
	Sexual contact	136(100.0)	0(0.0)	136(84.0)	
	Both b/t and sexual	7(100.0)	0(0.0)	7(4.3)	
Sexual habit	Heterosexual	162(34.2)	311(65.8)	473(100.0)	NA
Use of contraceptive	No	162(34.2)	311(65.8)	473(100.0)	NA

NA- Not Applicable

whom do not and their 95% CI was 4.48-15.43.

Similarly odds ratio were higher among the study subjects suffering from weakness, loose stool, cough, anorexia, tuberculosis other co-morbidities (skin infections, gynecological problem, lymph node and neurological problem) and STD than who do not. All co-morbidities factors were statistically highly significant (p<0.001).

Discussion

Migration is a usual phenomenon that takes place mostly from rural to urban areas. Those well educated migrate to places wherever get the opportunities, but illiterates and less educated always favor to migrate to industrialized cities. From this region of Uttar Pradesh migrations to industrialized cities are mostly to Mumbai & Pune in Maharashtra; Surat & Ahmadabad in Gujarat; Ludhiana in Punjab and to some extent to Delhi. These illiterates and less educated people who are facing the problem of poverty and having no employment opportunity in rural areas usually migrate single even if married. These migrants due to longer outside stay are indulging in risky sexual behavior usually with commercial sex workers (Newmann *et al*., 2000). Owing to ignorance of their HIV status and lack of awareness of mode of transmission these migrants expose their spouses during their intermittent return to their families and in turn to new born to the risk of HIV (George *et al*., 1997). This act is going on without break and disease load is continuously increasing geometrically (Pandey et al., 2007). Though both Uttar Pradesh and Bihar falls in the low prevalence states, HIV/AIDS epidemic is progressively increasing both in its magnitude and

Table 3: Distribution of seropositivity rates among subjects in the age group 50 and above with respect to their co morbidities.

Co morbidities		HIV Status		Total N (%)	χ^2/ P-value	Odds ratio	95% CILB-UB
		Positive N (%)	Negative N (%)				
Fever	Yes	88(62.9)	52(37.1)	140(29.6)	72.27	5.92	3.86-9.10
	No	74(22.2)	259(77.8)	333(70.4)	P<0.001		
Weight loss	Yes	48(76.2)	15(23.8)	63(13.3)	56.77	8.31	4.48-15.43
	No	114(27.8)	296(72.2)	410(86.7)	P<0.001		
Weakness	Yes	108(74.5)	37(25.5)	145(30.7)	150.3	14.81	9.22-23.79
	No	54(16.5)	274(83.5)	328(69.3)	P<0.001		
loose stool	Yes	38(84.4)	7(15.6)	45(9.5)	55.64	13.31	5.79-30.61
	No	124(29.0)	304(71.0)	428(90.5)	P<0.001		
Cough	Yes	33(70.2)	14(29.8)	47(9.9)	28.23	5.43	2.81-10.48
	No	129(30.3)	297(69.7)	426(90.1)	P<0.001		
Anorexia	Yes	66(75.0)	22(25.0)	88(18.6)	79.73	9.03	5.29-15.42
	No	96(24.9)	289(75.1)	385(81.4)	P<0.001		
Tuberculosis	Yes	28(77.8)	8(22.2)	36(7.6)	32.79	7.91	3.52-17.82
	No	134(30.7)	303(69.3)	437(92.4)	P<0.001		
Other	Yes	132(30.8)	297(69.2)	429(90.7)	24.81	0.21	0.11-0.41
co- morbidities	No	30(68.2)	14(31.8)	44(9.3)	P<0.001		
STD	Yes	27(100.0)	0(0.0)	27(5.7)	NA	NA	NA
	No	135(30.3)	311(69.7)	446(94.3)			
Apparently	Yes	0(0.0)	0(0.0)	0(0.0)	NA	NA	NA
Healthy	No	162(34.2)	311(65.8)	473(100.0)			
Total		162(34.2)	311(65.8)	473			

NA- Not Applicable

geographical spread as indicated through records of ICTC, Department of Microbiology, IMS, BHU (Mukhopadhyay *et al*., 2001).

Social conditions in rural areas characterized by poverty, gender inequality, and illiteracy magnify the harmful impact of infection. Any strategy to deal with HIV infections in rural areas in India must, therefore, include interventions to mitigate their inequalities (Boerma *et al*., 2002).The present study provides the insight of the HIV/AIDS suspects attending to SS Hospital or ICTC, Department of Microbiology, IMS, BHU. These detailed findings cannot be generalized, but are very much useful to illustrate the scenario for further intervention strategy.

The most common mode of HIV transmission in the study is heterosexual intercourse, which confirms the findings of earlier studies from India (NACO 2000-01; Kumarasamy *et al*., 1995; Solomon *et al*., 1998).

The overall sero-positivity rate was 34.2% (37.8% among males and 28.9% in females). Positivity rate was higher in rural suspects than urban. Higher seropositivity was observed among the widows (67.5%) than married subjects (32.4%). The seropositivity rate was 35.2% among uneducated. More than one-third of low income group were seropositive. Higher seropositivity was among migrants than non-migrants and the difference observed was statistically highly significant (p<0.001). 73.9% seropositivity was observed among subjects having history of multiple sexual contacts whereas only 17.9% among the subjects who do not have any such history (Bloom et al.(2002), Grass et al.(1999), Lurie et al.(2003)).The seropositivity was 100.0% among the drug users. This indicates that society of this region intact with strong social customs and taboos is now breaking down and leading to a serious problem of HIV spread.

Conclusion

Multiple sexual contacts are the main culprit for the spread of HIV which is more common in migrants with low literacy level. In a society of this region bound by traditions and culture the multiple sexual contacts even among non-migrant females pose a serious concern. This indicates that the culture is breaking down and because of this HIV

transmission may pose a serious threat in future if no suitable measures to prevent this infection are adopted well in time.

HIV prevention and intervention strategies need to focus on married, monogamous Indian women whose self-perception of HIV risk may be low, but whose risk is inextricably linked to the behavior of their husbands.

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Posterior fossa primitive neuroectodermal tumor- A case report

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Key words

Posterior fossa, Primitive neuroectodermal tumor, MR Spectroscopy.

Introduction

Primitive neuroectodermal tumors (PNETs) develop from primitive or undifferentiated neuroepithelial cells from the early development of the nervous system. Posterior fossa PNET is the most common malignant pediatric brain tumor, accounting for 15 to 30% of all pediatric CNS tumors and 30 to 55% of posterior fossa tumors[1]. The peak age for presentation of these tumors is between 5 and 7 years, with 80% diagnosed between ages 1 and 10 years[2]. The male to female ratio is from 1.3 to 2.7:1[3].

We present a case of posterior fossa PNET with MR Spectroscopic correlation in a 10 year old boy.

Case report

A 10 year old boy presented with history of irritability, lethargy, decrease social interaction, headache, nausea, vomiting and imbalance since one year. The symptoms gradually increased in severity since three months. When the patient reported in our institution, he had been taking antitubercular drugs for last 7 to 8 months, which were prescribed to him by a peripheral medical centre.

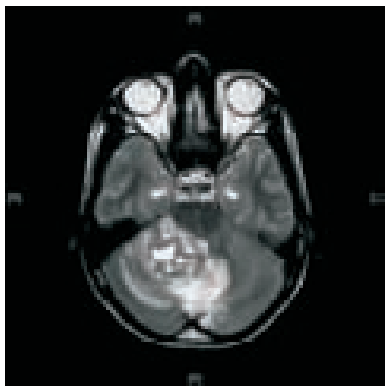

Fig. 1: Axial T2 image shows a heterogeneous mass lesion, containing multiple cystic areas, involving right cerebellar hemisphere and vermian region. Solid component of the mass is iso to hypointense to cortex. Significant surrounding edema and mass affect is also noted on fourth ventricle and brain stem.

MRI brain and MR Spectroscopy was done in our hospital, which showed a heterogeneous mass lesion involving right cerebellar hemisphere and vermian region, containing multiple cystic areas. The solid component of the mass was iso- to hypointense to cortex on axial T2 images (Fig. 1). Significant surrounding oedema was noted, which caused effacement of fourth ventricle and hydrocephalus. Corresponding FLAIR images showed solid components of the mass were isointense to the cortex (Fig. 2). Significant mass effect was noted on brain stem. The post contrast images showed intense enhancement of solid components (Fig. 3).

Single Voxel MR Spectroscopy (^{1}H MRS) at TE 35 and 144 showed significant increase of choline relative to NAA (Fig. 4 & 5). Lipid/ lactate and aminoacids peaks were also noted at 1.3- 1.4 and 2.05 to 2.5 ppm respectively. Elevated taurine concentration was indicated by complex signal intensity at 3.3-3.4 ppm (Fig.4).

Based on these MRI and MR Spectroscopic features, radiological diagnosis of PNET was made. Surgical resection of the tumor was done. Histopathologial examination of the resected tumor mass showed densely cellular proliferation of sheets of cells with dark nuclei and scarce cytoplasm, along with high mitotic rates, which led to the final diagnosis of PNET (Fig.6).

Discussion

Primitive neuroectodermal tumors can arise in different locations and have been known by different names depending on their location. The different sites of the origin of PNET include posterior fossa (medulloblastoma);

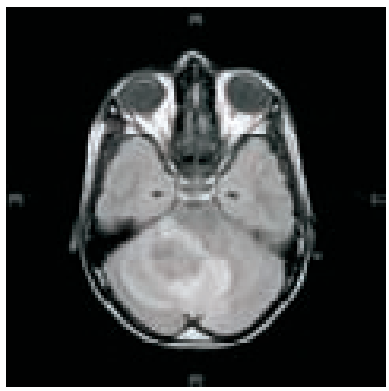

Fig. 2: Corresponding T2 FLAIR image shows solid components of the mass are iso intense to cortex.

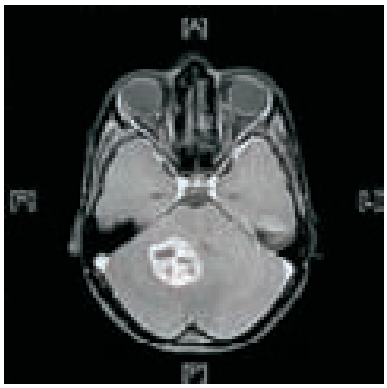

Fig. 3: Post Contrast T1 SE image shows intense enhancement of solid components.

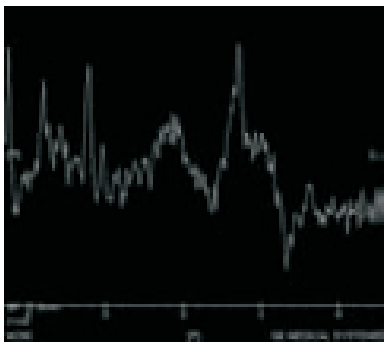

Fig. 4: MR Spectroscopy at TE 35ms shows significant elevation of choline, relative to NAA and Cr. Lipid/ lactate and aminoacids peaks are noted at 1.3-1.4 ppm and 2.05 to 2.5 ppm respectively. Elevated taurine concentration is indicated by complex signal intensity at 3.3-3.4 ppm.

pineal region (pineoblastoma); supratentorial brain (central neuroblastoma); and eye (retinoblastoma). These tumors are WHO grade IV[3].

Posterior fossa PNET is the most common malignant pediatric brain tumor, accounting for 15-30% of all pediatric CNS tumors and 30-55% of posterior fossa tumors[1].

Peak age of presentation is between 5 and 7 years, with 80% diagnosed between ages 1 and 10 years[2].

Eighty percent of the PNETs involve the vermian tissue to some extent[1]. 20% arise laterally in the cerebellar hemisphere without involvement of the vermis[3].

Tumors arising laterally in the adolescent and young adult tend to be more desmoplastic than those that arise in the vermis of younger patient. Brain stem involvement is seen in up to 38% of the patients, and the incidence of hydrocephalus is seen in more than 90% in some series[3]. Although cysts can be seen with the tumor from 20% to 80% cases, they are less a feature of PNET and more typically of cerebellar astrocytoma.

PNETs characteristically present with a brief period of symptoms. The symptoms are due to hydrocephalus and consist of headache, irritability, vomiting, blurred vision and frequent ataxia.

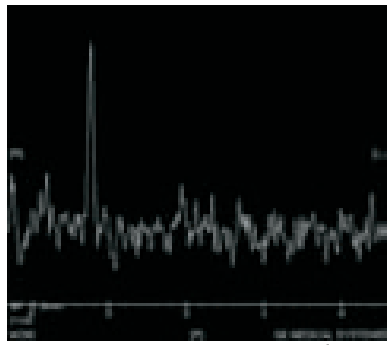

Fig. 5: MR Spectroscopy at TE 144 ms shows significant elevation of choline peak relative to NAA and Cr. Inverted peak of lactate is seen at 1.3-1.4 ppm.

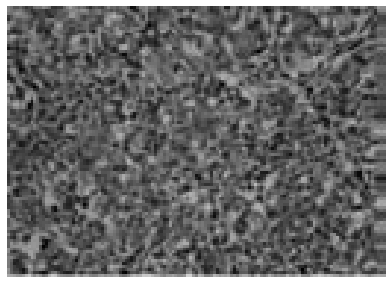

Fig. 6: Photomicrograph of histological section shows densely cellular proliferation of sheets of cells swith dark nuclei and scarce cytoplasm, along with abundant mitotic figures. (Hematoxylin & Eosin stain, 40X)

On MRI, PNETs shows different characteristic from other pediatric CNS tumors on FLAIR and diffusion weighted images: the signal of solid portions of the tumor is often isointense with gray matter on FLAIR images and hyperintense on diffusion weighted images. The restrictive diffusion of PNET is due to high cellularity, increased nuclear to cytoplasmic ratio and dense packing of these tumors[4]. The restricted diffusion is noted in 95% of the cases[3].

On T1- weighted images, the solid components of medulloblastoma generally have low signal. On T2-weighted images, the signal of solid component is intermediate between gray and white matter. Heterogeneity within the tumor on MRI can be due to hemorrhage, cysts or necrosis[3].

Measurement of ADC values for solid components of PNETs (range 0.67 to 0.99, mean 0.83 x 10^{-3} mm^2/sec) are consistentally lower than those for ependymomas (range 1.0 to 1.3, mean 1.23 x 10^{-3} mm^2/sec)[5].

In about 75% of the cases, the solid portions of the tumors enhance completely and intensely. Incomplete or complete lack of enhancement is seen in about 25% of the cases[6].

MR Spectroscopy shows marked elevation of choline levels and markedly decreased or absent NAA; lactate/lipid moieties can be identified[7].

Taurine, an amino sulfonic acid, is also elevated in PNET

and may be demonstrated with proton spectroscopy performed with a short echo time of 20-35 ms. Taurine concentration in 13 patients with PNETs ranged from 2.62 to 11.15 m mol/kg with a mean of 6.09 ± 2.24. The mean concentration in 16 non PNET tumors was 0.76 m mol/kg ± 0.95. Taurine was detected in all PNET spectra, as a complex signal at approximately 3.4ppm, while there was no prominent taurine peak in other tumors[8].

In our spectroscopic study, significant elevation of choline, relative to NAA was also noted. The elevated taurine concentration was indicated by complex signal intensity at approximately 3.4 ppm, correlated with the previous reports.

The quantitation of taurine in vivo with MR imaging is challenging because of complex signal pattern, low concentration, and partial overlap with other resonances in the spectrum, particularly scyllo- inositol and glucose. Thus, a single voxel acquisition method was selected instead of chemical shift imaging to ensure that the quality of tumor spectrum was not affected adversely by unavoidable compromises accompaniying chemical shift imaging acquisitions from larger volumes where good homogeneity of magnetic field and water suppression is not always achieved uniformly. In addition, MR Spectroscopy with a short echo time (i.e. 35 m sec) was used to minimize signal decay due to T2 relaxation of less prominent metabolites such as taurine[8].

In conclusion, signal voxel ^{1}H MR Spectroscopy was performed in untreated pediatric brain tumors and showed that taurine concentration was significantly elevated in PNETs and useful in their differentiation from other tumors. Different taurine concentration in individual PNETs may indicate heterogeneity in metabolism[8].

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Mother care practices: A cluster survey

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Abstract

Background

Despite continuous efforts by government functionaries the utilization and awareness regarding antenatal care is still poor in India.

Aims

To find out the practices regarding antenatal care practices in rural and urban Agra district.

Study design

Community based cross sectional study utilizing rapid assessment procedures in Mohallas of Agra city and villages of Agra district.

Material and methods

Semi structured and pre tested schedule was used to interview 541 mothers of under one year children in 80 clusters of Agra district.

Statistical analysis

Tests of significance like chi squre test.

Results

More than half of mothers (53.6%) got registered with ANC services. It was found that 56.2 percent received two doses or booster dose of Tetanus Toxoid Vaccine and IFA supplementation services utilization was 44.7%. Only 21.8 percent undergone health checkup, 12% took one additional diet per day and 23.8% took rest for two hours in the daytime. Around 54 percent deliveries were taken place at home and around 61 percent deliveries were attended by trained personnel

Key words

ANC services, place of delivery, trained health personnel

Introduction

The antenatal period offers opportunities for delivering health information and services that can significantly enhance the health of women and their infants, but its potential remains insufficiently exploited. Antenatal visits offer entry points for a range of other programmes – such as nutrition, malaria, and TB – as well as for obstetric care.[1] More recently, the potential of the antenatal period as an entry point for HIV prevention and care, in particular for the prevention of HIV transmission from mother to child, has led to renewed interest in access to and use of antenatal care services[2,3,4].

In the developing world, antenatal care use is around 68% but this indicates considerable success for programmes aimed at making antenatal care available. The region of the world with the lowest levels of use is South Asia, where only 54% of pregnant women have at least one antenatal care visit but this progress was greatest as the antenatal care increased by nearly one third over the period (1990-2000), although this region started from the lowest base[1].

The present study was done to assess the mother care and delivery practices through cluster survey technique.

Material and methods

Present study was conducted in a district of U.P. state, India. A cross sectional study was done utilizing multi stage random stratified cluster-sampling and multi indicator rapid assessment technique for interviews. Study was conducted in 30 urban and 50 rural clusters of district.

A total of 80 communities were selected in two stages while in third stage each community was divided into four quadrants. In each quadrant, 10 households were visited in continuation by selecting first household randomly; the random number taken as the last digit of currency note. This gave us the 40 households, required from a cluster, making a total of 3200 households for the study. The study was conducted by the author under guidance of coauthors which was monitored through observing filled formats, counterchecking the covered houses and by validating the data entered.

All the mothers of under one year children in the selected 80 clusters of district were interviewed during house to house visit for ANC services and delivery practices.

The information collected was computerized in specific programme developed on computer software Fox pro (version 2.6) and analyzed with the help of SPSS statistical software (version 10.3).

Results

Registration

More than half of mothers got registered for ANC services at one or the other health agency. The registration rate was higher in rural area than urban. There is significant association of registration with more than three antenatal visits (22.2, >10.8, p<0.001)

TT Immunization

Table II reveals that 56.2 percent mothers had received two doses or booster of tetanus toxoid vaccine during their nine month's span of pregnancy, and the coverage was higher (58.9) in urban than (54.8) in rural areas.

About one-eighth mothers had received only one dose of tetanus toxoid vaccine with only slight difference in rural and urban settings (12.5 % in rural and 13.3 % in urban). 31.1 percent mothers had not received any tetanus toxoid vaccine (32.7 % in rural and 27.8 % in urban areas).Thus more than two-third mothers had received one or more doses of tetanus toxoid vaccine in both settings (rural 67.3 % and urban 72.2 %).

There is significant association between more than three visits with two doses of TT and IFA consumption (19.3, >13.8, p<0.001) but there is no association between one visit and TT booster in both rural and urban areas (0.02, >0.05).

IFA supplementation

It was found that 51 percent mothers were given IFA tablets while this percentage was 49.3 in rural area. Table 3 shows that out of the mothers who were given IFA tablets 23.7 percent did not consumed it, this percentage being higher in urban than rural (37.8 & 15.2 % respectively). However, majority mothers i.e. 57.6% consumed more than 50 tablets during antenatal period out of which maximum (44.6%) consumed more than 100 tabs.

The percentages of mothers consuming more than 100 IFA tablets were higher in rural area than urban (46.1% and 41.8% respectively). About twenty percent mothers consumed less than 50 tablets during antenatal period.

It was also observed that out of total pregnant women, only about 30% consumed 50 or more tablets and in this 22.7% consumed 100 or more tablets. There were 11.8 percent mothers who were given IFA tablets, but did not consumed it, this percentage being higher in urban area than rural (20.6 and 7.5).

ANC check ups

Table IV presents the information on the number of antenatal check-ups of these mothers. It was found that 53 percent mothers were not provided any health check-ups. The percentage of such mothers was very high in rural area than in urban area (60.7 and 39.8 percent).

21.8 percent mothers had three or more antenatal check ups, this proportion being more than double in urban than rural (33.9 & 15.8). 10 percent mothers had gone under only one antenatal check up. It was also inferred from table 3 & 4 that though 53.6% mothers had ANC registration but only 47 percent had gone under antenatal check ups.

Place of delivery

Out of the 541 deliveries in past one year, 293 (54.2%) had taken place at home. Home deliveries in the rural area accounted for 61.2 percent as compared to 40 percent in the urban areas.

The maximum (47.8%) deliveries in urban area took place in the private hospitals and maternity homes. The proportion of deliveries that took place in the government hospitals in urban area, rural area and the combined were 12.2 percent, 6.4 percent and 8.3 percent respectively. Very few deliveries of rural mothers took place at sub center, PHC or CHC (1.2, 5.0 and 3.6% respectively).there is significant association between more than three visit and institutional deliveries (21, >13.8, <0.001) therefore we can infer that if a beneficiary comes for all the three visits that increases her confidence in providers and their suggestions.

Service providers

Regarding registration among 53.6 percent registered pregnancies, 38.8 percent were registered to Govt. functionaries (9.2 percent to AWW, 24.2 percent to ANM and 5.4 percent to Govt. doctors).

However, in rural settings health workers did most of the registrations like one-third to ANM and one tenth to AWW. Private doctors did 14.8 percent registrations only, this

Table 1: Registration and Advices

	Rural (n=361)		Urban (n=180)		Combined (n=541)	
	No.	%	No.	%	No.	%
Registration	198	54.8	92	51.1	290	53.6
One Additional Diet	28	7.8	37	20.6	65	12.0
Day Time Rest of Two Hours	72	19.9	57	31.7	129	23.8

Table 2: Tetanus Toxoid Immunization

Immunization	Rural (n=361)		Urban (n=180)		Combined (n=541)	
	No.	**%**	**No.**	**%**	**No.**	**%**
TT2/Booster	198	54.8	106	58.9	304	56.3
One	45	12.5	24	13.3	69	12.8
Not given	118	32.7	50	27.8	168	31.1

Table 3: IFA Supplementation.

IFA Tablets	Rural (n=361)		Urban (n=180)		Combined (n=541)	
	No.	%	No.	%	No.	%
Given	178	49.3	98	54.4	276	51.0
Consumed (Who received it)						
Nil	27 (7.5)	15.2	37 (20.6)	37.8	64 (11.8)	23.2
<50	40 (11.1)	22.5	13 (7.2)	13.3	53 (9.8)	19.2
50-99	29 (8.0)	16.3	7 (3.9)	7.1	36 (6.7)	13.0
>100	82 (22.7)	46.1	41 (22.8)	41.8	123 (22.7)	44.6

(The percentages given in parenthesis are out of total mothers)

percentage being higher in urban areas as compared to rural settings (13.1 and 6.6%).

Only two-third mothers had got tetanus toxoid immunization during pregnancy. The proportion of such pregnancies in the rural area was 67.3, of whom more than one third were by ANM, 8.3 percent by Govt. doctors and about 20 percent by private doctors. The tetanus toxoid immunization in city was mainly done by private doctors (50.6%) and Govt doctors (13.3%).

Birth attendants

Regarding the persons who attended/conducted the delivery, it was observed that in the district, a very high percentage of deliveries (30.5%) were being conducted by family members who could be considered as untrained. The proportion of such deliveries in the rural area was 32.1 percent in comparison to only 27.2 percent in the urban area.

Private doctors conducted about one-third deliveries but the majority was in the urban area (47.2%) in comparison to only 21.9 percent in the rural areas. Health workers conducted only 1.7 percent and 14.4 percent deliveries in the urban and rural area respectively. Trained dais were conducting 10.5 percent deliveries in the district, which were higher in the rural area (7.8% of total delivery). It was also observed that about 9.4 percent deliveries were by untrained dais, this being more (11.4%) in rural areas.

It was inferred that trained personnel in the district attended 61 percent deliveries while this figure was higher in urban area compared to rural area (70.0 and 52.7 percent respectively).

Regarding the good antenatal practices of these mothers it was found that only 12% took one additional diet per day and 23.8% took rest for two hours in the daytime, the

Table 4: ANC Check-Ups In Urban and Rural Mothers.

Number of ANC Check-ups	Rural (n=361)		Urban (n=180)		Combined (n=541)	
	No.	%	No.	%	No.	%
1	35	9.7	19	10.6	54	10.0
2	50	13.9	32	17.8	82	15.2
3	28	7.8	15	8.3	43	7.9
>3	29	8.0	46	25.6	75	13.9
Nil	219	60.7	68	37.8	287	53.0

practices being better in urban area (20.6% & 31.7% in urban as compared to 7.8% and 31.7% in rural area).

It was found in present study that the minimum covered antenatal service in district was of IFA supplementation (44.7%), which was mainly provided by ANM (22.4%) and private doctors (8.1%). In rural settings IFA tablets were mainly provided by ANM (30.2%) and AWW (7.8%) while in urban settings these were mainly provided by private doctors (13.3%).

Only 47 percent mothers had availed the facility of health check-ups, maximum being done by private doctors (26.1%). In urban area Private doctors and Govt doctors had done more than half of the check-ups (45.6% and 15%). In rural settings about thirty percent mothers, were examined by private doctors and ANM (16.3% and 13%) and very few by Govt. doctors.

Discussion

Regarding ANC registration, many studies reported higher percentage[5,6] while lower figure (40%) was reported by Jain et al[3].

Similar findings to present study for TT immunization (56.2%) among antenatal mothers were reported in 5,9 many studies but the higher percentages were reported by Chawala et al[5], Rajeswari et al[6], Singh et al[7] and Jain et al[3] reported as 67.7,98.2, 78and 66.7 percent respectively.

IFA supplementation figures were reported to be similar with MICS (53.8%)[8] while lower figures reported by Panwar et al (35.7%)[1]. The observed higher figures compared to other studies from same area were might be due to the

Table 5: Delivery Practices in Urban and Rural Areas.

Place of Delivery	Rural (n=361)		Urban (n=180)		Combined (n=541)	
	No.	%	No.	%	No.	%
Home	221	61.2	72	40.0	293	54.2
Sub center/ PHC/CHC	37	10.2	-	-	37	6.8
Govt. Hospital	23	6.4	22	12.2	45	8.3
Private Hospital	80	22.2	86	47.8	166	30.7

running projects of International organization in two blocks of district. Higher findings were reported in studies done by Chawala et al[5] and Singh et al[7] as 65.4 and 73 percent respectively indicating a better situation in these areas.

More than one fifth mothers (21.9%) undergone three or more than three antenatal check-ups and the similar finding was reported by Nandan et al[2]. and Jain et al[3] as 23 and 21 percent respectively while Shrivastava et al[9] reported 20.9 percent for rural and 29.6 percent for urban mothers. Higher percentage was reported by Singh. et al[7] as 62 % for mother who had received three or more ANC visits.

Out of the 541 deliveries in past one year, 293 (54.2%) had taken place at home. Home deliveries in the rural area accounted for 61.2 percent as compared to 40 percent in the urban areas. Trained personnel in the district attended 61 percent deliveries while this figure was higher in urban area compared to rural area (70.0 and 52.7 percent respectively).

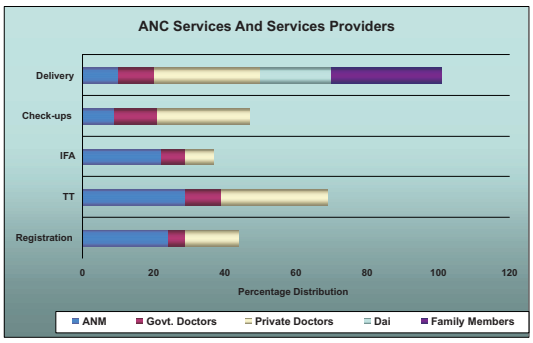
Similar percentage of home delivery were reported[6,5,13] in many studies while comparatively lower percentage reported by Ray et al[10] and NFHS-3[18] as 43 and 26.3 percent respectively. On the other hand higher percentage were reported at same place[3] as 68 percent while from other parts[4,11] as 88.3 and 90 percent respectively. The same could be because of regional difference in health services status in those areas.

The percentages of deliveries conducted by trained personnel as given by different workers in their studies were 29.2, 43.2, 48.2 and 50.1 by NFHS-3[18], Rajeswari et al[6], Panwar [3]and Murthy et al [12]

Conclusion and recommendation

Antenatal registration was 53.6 percent but less than one-fourth had adequate antenatal care and 56.3 percent mothers were given TT2/Booster. About half of deliveries were domiciliary and the trained personnel attended only 61 percent deliveries. The present study shows that the utilization of antenatal services is very low and the numbers of domiciliary deliveries are very high.

Greater efforts are needed to improve the content and quality of antenatal services offered. In addition, increased attention is needed to ensure that particular groups of women, specifically those living in rural areas, the poor and the less educated, obtain better access to antenatal services. To improve the quality and quantity of antenatal care services, it is necessary to improve inter-sectoral coordination, by forming local bodies of active members for awareness generation and quality assurance and through increasing community participation



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Micro pathological changes in the hair follicle of normal appearing skin and its role in transmission of disease in leprosy

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Abstract

Leprosy is a chronic inflammatory disease caused by Mycobacterium Leprae, which affects not only the peripheral nerves and skin but also various internal viscera through the hematogenous spread, especially in lepromatous cases. Low socioeconomic status people are affected more. In this study the total numbers of patients included were 60 from Meerut and nearby area. The pattern of leprosy among the patients were indeterminate, 25 cases (41.6%); tuberculoid, 6 cases (10.0%): borderline leprosy, 4 cases (6.6%); borderline lepromatous, 4 cases (6.6%) and lepromatous leprosy, 7 cases (11.6%). The aim of the study is to show the presence of bacilli in the hair follicle of normal appearing skin sites from leprosy cases and to correlate the transmission of disease from intact skin. The methods used for the study are (1) Hematoxylin and Eosin staining (2) modified Harada's allochrome method for demonstrating AFB.

Definitive histopathological changes along with presence of bacilli in the hair follicle of normal appearing skin are noticed. Presence of AFB is significant as far as dissemination and transmission of disease is concerned. It may be due to phagocytic activity of keratinocytes which engulf bacilli, hence, possibility of discharge of lepra bacilli from intact skin, even without ulceration, should be seriously considered.

Key words

Leprosy, hair follicle, acid fast bacillus, lepromatous leprosy, indeterminate leprosy.

Introduction

Leprosy is a chronic granulomatous disease caused by Mycobacterium Leprae. Usually the organisms are found in the sub epidermal zone, inside the nerves, sweat glands, arrector pilli muscle, macrophages and around the hair follicle[1-3]. In most instances, it has been considered that the skin is the primary site of invasion with secondary centripetal spread into the nerves.

Definite histological changes are seen in the normal appearing skin of all types of leprosy. However, the involvement is more in the cases which belong to lepromatous end of the spectrum compared to those belonging to tuberculoid end of the spectrum. Biopsy samples were taken from clinically diagnosed cases of leprosy, minimum 10 cm away from site of lesion.

Material and methods

Skin biopsy, atleast 10 cm away from site of lesion of clinically diagnosed leprosy patients attending the skin OPD of Chattrapati Shivaji Subharti Hospital, Subharti Medical College, Meerut constituted the material for the study.

A clinical record of patient's age, sex, duration of lesion, occupation, socioeconomic status, family history and previous treatment was maintained. 10% neutral formalin fixed skin biopsies were processed for paraffin sectioning. The following staining methods were applied for histological investigations.

- Hematoxylin and eosin
- Harada's modified allochrome method for acid fast bacillus [4].

Observations and results

Total numbers of patients included in this study were 60. The pattern of leprosy among the patients were indeterminate, 25 cases (41.6%); tuberculoid, 14 cases (23.3%), borderline tuberculoid, 6 cases (10.0%), borderline leprosy, 4 cases (6.6%), borderline lepromatous, 4 cases (6.6%) and leopromatous leprosy, 7 cases (11.6%). The ratio between male and female was 3.2: 1. The site of lesions was mainly in the extremities, back and face.

The changes were seen in hair follicle of normal appearing skin in all type of leprosy, but involvement was more in

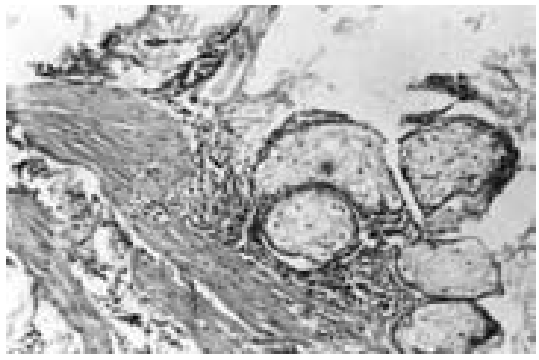

Fig. 1: Infiltration in relation to skin appendages in lepromatous leprosy cases. H&E staining 100x.

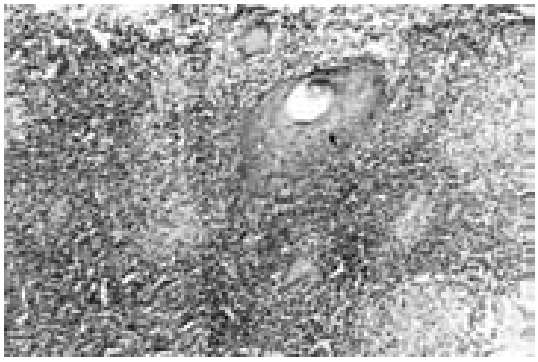

Fig. 2: Photograph showing the presence of the borderline tuberculoid granuloma in relation to the hair follicle in the BL leprosy case. H&E 100x

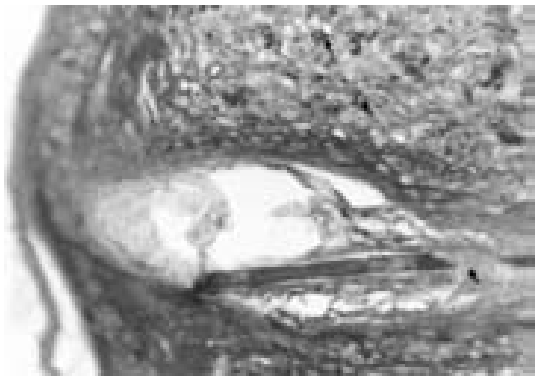

Fig. 3: Photograph showing the atrophied hair follicle surrounded by foamy cell granuloma with numerous bacilli in a LL case. Modified Harada's allochrome method 400 x.

lepromatous end of the spectrum compared to those belonging to tuberculoid end of the spectrum. (Table 1)

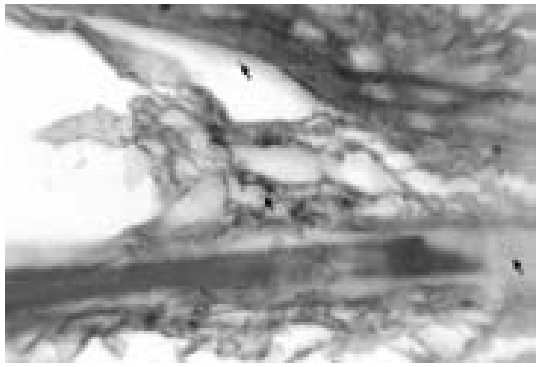

Fig. 4: Photograph showing the isolated bacillus in the inner hair root sheath of the atrophied hair follicle in a LL case. Modified Harada's allochrome method 100 x.

The infiltration of varying degree (fig. 1) was seen in almost all variety of cases from lepromatous to tuberculoid. Formation of granuloma (fig. 2) along with presence of acid fast bacilli (fig. 3) and atrophy of hair follicle also demonstrated (Fig. 4).

Discussion

The common form of leprosy seen in Meerut and nearby areas is of the indeterminate type. The paucibacillary form (45 cases of borderline tuberculoid, tuberculoid and indeterminate) is more common compared to multibacillary (15 cases of lepromatous, borderline lepromatous and borderline type). Male dominance over female was present and male female ratio was 3.2: 1.

Definitive histological changes were seen in the hair follicle of normal appearing skin of leprosy cases. Varying degrees

Table 1: Histological features of hair follicle in normal. Appearing skin of leprosy cases

	Granuloma/Focal Cell Collection (FCC)	Infiltration	Presence of Acid Fast Bacilli (AFB)
Lepromatous Leprosy (LL) n=7, 11.6%	3 (42.8%)	2 (28.4%)	3 (42.8%)
Borderline Lepromatous (BL) n=4, 6.6%	2 (50.0%)	2 (50.0%)	1 (25.0%)
Borderline Leprosy (BB) n=4, 6.6%	2 (50.0%)	2 (50.0%)	-
Borderline Tuberculoid (BT) n=6, 10.0%	1 (16.6%)	4 (66.6%)	1 (16.6%)
Tuberculoid (TT) n=14, 23.3%	6 (42.8%)	11 (78.5%)	2 (14.3%)
Indeterminate (INDT) n=25, 41.6%	3 (12.0%)	20 (80.0%)	1 (4.0%)

of infiltration of hair follicle with histiocytes and lymphocytes were seen in multibacillary as well as paucibacillary forms of leprosy. Ganpati et al[5] noted the presence of AFB in 2 out of 46 cases in the skin of LL-BL range. In this study the presence of AFB were seen in 8 out of 60 cases from normal appearing site. Bacilli might have reached the hair follicle through established vascular dissemination[6-7] or through rich nerve plexus in the dermal papillae[1]. Bacilli present in outer hair root sheath may cause atrophy of hair follicle[8] while bacilli present in inner hair root sheath can reach the skin surface through the shaft of the hair aided by the movement of sebum. On reaching the surface they might get spread along with the sweat to other areas[9-10]. In the present study the bacilli were seen both in outer and inner hair root sheath of normal appearing skin site of leprosy cases.

From this study it is concluded that hair follicle involvement exists in the normal appearing skin of all type of leprosy. Moreover the degree of lesion increases with decrease in the immunity from TT to LL end of spectrum. Acid fast bacilli were seen in hair follicle of normal appearing site.

Conclusion

Presence of AFB is significant as far as dissemination and transmission of disease is concerned. It may be due to phagocytic activity of keratinocytes, which engulf bacilli; hence possibility of discharge of leprosy bacilli from intact skin, even without ulceration should be seriously considered[11]. Observations in this study are confined to light microscope level.

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Effect of anticonvulsant drugs on lipid profile in epileptic patients

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Abstract

Patient with epilepsy may manifest metabolic adverse effect through the course of their management with antiepileptic drugs. One hundred and twenty patients with epilepsy both male and female who had been on various anticonvulsant drugs were selected for the study of their lipid profile. The study showed a significant increase serum level of triglyceride, total cholesterol, HDLc and VLDLc in patients receiving combination therapy of either Phenytoin and Phenobarbitone or Phenytoin and Carbamazepine or Phenytoin alone. Patients receiving Carbamazepine alone had significant increase in serum levels of triglyceride and VLDLc but no significant changes in serum levels of total cholesterol & HDLc in this group. A significant correlation between duration of anticonvulsant therapy and lipid profile was established. The results showed adverse effect on cholesterol levels in patients on long term antiepileptic drugs therapy. It is recommended lipid profile should be regularly checked in patients undergoing such treatment.

Key words

Anticonvulsant drugs, Epilepsy, Lipid profile, metabolic abnormalities, Seizure,

Introduction

Epilepsy is one of the most common disorders of the nervous system. Prevalence of epilepsy is estimated at over two million cases in United States[1,2] and there are approximately six million people suffering from epilepsy in India alone with the prevalence rate of 9/1000. In most studies, prevalence rates lie between 4 and 10 per 1000 population[3,4]. Recent advances in the diagnosis of epilepsy include the development of clinical classification of epileptic seizures and the recognition of specific epileptic disorders. Though the incidence of the seizures complications have declined but incidence of various metabolic and endocrinal abnormalities remained same in epileptic patients. Anticonvulsant drugs are used regularly, so long-term antiepileptic therapy may be associated with various metabolic abnormalities in connective tissues, endocrine system and the liver[5]. Anticonvulsants may alter liver function and increase the activity of hepatic microtonal enzyme system[5,6]. Enzyme inducting antiepileptic drugs adversely affect the lipid profile and may therefore increase risk of cardiovascular disease[21]. This enzyme induction phenomenon is associated with an altered metabolism of various substances such as drugs and lipids[5,6]. This study has focused attention on changes in lipid profile during long-term anticonvulsant therapy especially by alteration in liver functions and increased activity of the hepatic microsonal enzyme system[6,7]. The clinical significance of these changes has not yet been clearly established. The present study was undertaken to study the effect of anticonvulsant drugs on serum levels of triglyceride, total cholesterol, HDLc, LDLc and VLDLc.

Materials and methods

One hundred and twenty cases of epilepsy both male and female which had been on various anticonvulsant drugs , attending all clinical departments of Saraswathi Institute of Medical Sciences Hapur, Ghaziabad, U.P., India, from March 2008 to December 2009 were selected for the present study. Patients suffering with diabetes mellitus, nephrotic syndrome, myxoedema and familial hypercholesterolemia, obesity and menstrual disorder, which might affect the blood lipid, were excluded. Sixty healthy individuals preferably relatives of patients were selected to serve as normal control. After an overnight fast of 14-16 hours , 5 ml blood samples of patient and control were collected in vacuum tubes and allowed to clot at room temperature for 60-120 minute followed by centrifugation at 3000 g for 10 min. at 40C. Serum was stored at -20C, for estimation of lipid profile.

Estimation of triglyceride

Estimation of triglyceride was performed by method described by Kaplan[8] by using commercially available kit from Sigma- Aldrich. In brief, 10 micro liter of serum was mixed with 1000 micro liter of reaction solution. The absorbance of sample was measured against the reaction solution at 540 nm, due to the formation of Quinoneimine dye, which is directly proportional to the total triglyceride concentration in the sample.

Estimation of total cholesterol

Estimation of total cholesterol was performed by Pelkonen *et al*.[7] CHOD-PAP method by using commercially available kit from Sigma-Aldrich. In brief, 0.02 ml of serum was mixed

Table 1: Distribution of patients according to age

Age group (Years)	No of patients	Percentage
Less then 10	03	2.5%
10-19	57	47.5%
20-29	42	35.0%
30-39	15	12.5%
40 and above	03	2.5%
Total	120	100%

Table 2: Distribution of patients according to duration of anticonvulsant therapy.

Duration of therapy (Years)	No of patients	Percentage
3-6	72	60%
7-10	33	27.5%
11-15	15	12.5%
Total	120	100.0%

with 2 ml of reaction solution (Enzyme solution with colour reagent). The absorbance of samples was measured at 540nm against the reagent blank value.

Estimation of serum HDLc

Estimation of serum HDLc was performed as described by Nikkila *et al.*[9] CHOD-PAP method by using commercially available kit from Sigma-Aldrich. In brief, 0.2 ml of serum was mixed with 0.5 ml of precipitating reagent solution and centrifuged at 4000 rpm for 10 minute. 0.1 ml of clear supernatant was mixed with 1 ml of reaction solution. The intensity of colour produced was directly proportional to the concentration of HDL cholesterol in the sample. The absorbances of samples were measured at 540 nm against the reagent blank value.

Estimation of serum LDLc & VLDLc

Estimation of LDLc & VLDLc were calculated by friedwald equation suggested method of Sattyanaryanan[1].

LDLc = Total cholesterol –(HDLc +VLDLc)

VLDLc = Total cholesterol - (HDL + LDL). The estimated values of LDLc & VLDLc were expressed in mg/dl.

Table 3: Distribution of patients according to various anticonvulsant drugs therapy

Drugs	No of patients	Percentage
Phenytoin	36	30.0%
Carbamazepine	18	15.0%
Phenytoin & Carbamazepine	30	25.0%
Phenytoin & Phenobarbitone	36	30.0%
Total	120	100.0%

Results

The study were conducted on 120 patients (84 male and 36 female) of different age group who were on various anticonvulsant drugs therapy for at least 3 years. 60 healthy age and sex matched individuals served as control.

Table no-1 shows the distribution of patients according to age group. The result shows maximum patients (57) 47.5% were in the age group of 10-19 years followed by (42) 35% were in age group of 20-29 years , while the least (03) 2.5% were in age group of 40 years and above.

Table no-2 shows the distribution of patients according to duration of anticonvulsant therapy.The result shows maximum patients(72) 60% were on 3-6 years of anticonvulsant therapy followed by (33)35% were on 7-10 years, while the least (15) 12.5% were on 11-15 years of anticonvulsant drugs therapy.

Table no-3 shows the distribution of patients according to various anticonvulsant drugs therapy used .The result shows maximum patients(36) 30.9% were on phenytoin alone or on phenytoin& phenobarbitone therapy followed by (30)25% were on phenytoin& carbamazepine therapy , while the least (18) 15% were on alone carbamazepine therapy.

Table no-4 shows level of serum total cholesterol, HDLc, VLDLc and triglyceride in epileptic patients on Phenytoin & Phenobarbitone therapy were significantly increased 199.48±16.34mg/dl, 71.34±5.84 mg/dl, 26.92 ±3.64 mg/dl and 134.62 ±18.16 mg/dl respectively as compare to control $p<0.001$, while no significant changes of LDLc were observed in this group as compare to control.

Table no-5 shows level of serum total cholesterol, HDLc, VLDLc and triglyceride in epileptic patients on Phenytoin & Carbamazepine therapy were significantly increased 193.14±16.28 mg/dl, 67.56±5.84 mg/dl, 99.56±06.98 mg/

Table 4: Lipid profle in patients receiving Phenytoin & Phenobaritone and in control

Serum concentration(mg/dl)	Phenytoin & Phenobarbitone (no=36) mean ± S.D.	Control(no=60) mean ±S.D.	P value
Total cholesterol	199.48±16.34	175.01±15.29	<0.001
HDLc	71.34±05.84	53.60±04.84	<0.001
LDLc	101.22±06.86	99.97±07.08	N.S.
VLDLc	26.92±03.64	21.44±03.37	<0.001
HDLc/T.CH.	0.36±0.04	0.31±0.03	<0.001
Triglyceride	134.62±18.16	107.18±16.83	<0.001

Table 5: Lipid profile in patients receiving Phenytoin & Carbamazepine and in control

Serum concentration(mg/dl)	Phenytoin & Carbamazepine (no=30) mean ± S.D.	Control(no=60) mean ±S.D.	P value
Total cholesterol	193.14±16.28	175.01±15.29	<0.001
HDLc	67.56±05.72	53.60±04.84	<0.001
LDLc	99.56±06.98	99.97±07.08	N.S.
VLDLc	26.02±03.58	21.44±03.37	<0.001
HDLc/T.CH.	0.35±0.04	0.31±0.03	<0.001
Triglyceride	130.12±18.04	107.18±16.83	<0.001

Table 6: Lipid profile in patients receiving Phenytoin alone and in control

Serum concentration(mg/dl)	Phenytoin(no=36) mean ± S.D.	Control(no=60) mean ±S.D.	P value
Total cholesterol	188.13±16.13	175.01±15.29	<0.001
HDLc	63.56±05.59	53.60±04.84	<0.001
LDLc	100.13±07.13	99.97±07.08	N.S.
VLDLc	24.44±03.41	21.44±03.37	<0.001
HDLc/T.CH.	0.34±0.04	0.31±0.03	<0.001
Triglyceride	122.18±17.06	107.18±16.83	<0.001

dl, 26.02 ±3.58 mg/dl and 130.12 ±18.04 mg/dl, respectively as compare to control p<0.001, while no significant changes of LDLc were observed in this group as compare to control.

Table no-6 shows level of serum total cholesterol, HDLc , VLDLc and triglyceride in epileptic patients on Phenytoin therapy were significantly increased 188.13±16.13 mg/dl, 63.56±5.59 mg/dl 24.44 ±3.41 mg/dl and122.18 ±17.06 mg/dl respectively as compare to control p<0.001, while no significant changes of LDLc were observed in this group as compare to control.

Table no-7 shows level of serum triglyceride and VLDLc levels in epileptic patients on carbamazepine therapy were significantly increased121.72 ±17.42 mg/dl and 24.34 ±3.43 mg/dl respectively as compare to control p<0.01, while no significant changes s of total cholesterol, HDLc and LDLc were observed in this group as compare to normal control.

Table no-8 shows among 120 patients of epilepsy, 72 were on 3-6 years (group A) of anticonvulsant therapy, 33 were on 7-10 years (group B) and 15 patients with 11-15 years were included in group C. The result shows level of serum total cholesterol, HDLc, VLDLc and triglyceride levels were significantly increased upto 10 years of long term anticonvulsant therapy and beyond this there were no significant change in lipid profile.

Comparison Beween

A & B	p	<0.001	<0.001	NS	<0.001	<0.001	<0.001
B & C	p	NS	NS	NS	NS	NS	NS
A & C	p	<0.001	<0.001	NS	<0.001	<0.001	<0.001

Table 7: Lipid profle in patients receiving Carbamazepine alone and in control

Serum concentration(mg/dl)	Carbamazepine (no=18) mean ± S.D.	Control (no=60) mean ±S.D.	P value
Total cholesterol	176.34±15.82	175.01±15.29	N.S.
HDLc	53.78±04.76	53.60±04.84	N.S.
LDLc	98.22±07.63	99.97±07.08	N.S.
VLDLc	24.34±03.43	21.44±03.37	<0.01
HDLc/T.CH.	0.31±0.032	0.31±0.03	N.S.
Triglyceride	121.72±17.42	107.18±16.83	<0.01

Table 8: Relationship between lipid profile and the duration of anti convulsant therapy

Duration of thearpy	No of patients	Cholesterol Mean ±S.D	HDLc Mean ±S.D	LDLc Mean ±S.D	VLDLc Mean ±S.D	HDLc/Cholesterol Mean ±S.D	Triglyceride Mean ± S.D.
A. 3-6 Years	72	186.14 ±16.09	61.61 ±5.78	99.95 ±5.78	24.58 ±3..53	0.33±0.036	122.89 ±17.63
B. 7-10 Years	33	197.98 ±16.09	70.88 ±5.78	100.13 ±7.13	26.97 ±3..53	0.36±0.038	134.84 ±17.94
C11-15 Years	15	199.85 ±15.98	72.62 ±5.53	100.19 ±6.99	27.04 ±3..47	0.36±0.033	136.08 ±17.31

Discussion

The present study was carried out from March 2008 to December 2009 on one hundred and twenty patients (84 male and 36 female) of epilepsy, attending OPD of all clinical departments at Saraswathi Institute of Medical Sciences Hapur, Ghaziabad UP India. The most common seizure type observed was primary generalized tonic - clinic. Significant correlation between duration of anticonvulsant therapy and lipid profile was established. The longer the duration of therapy the greater was the increase in serum triglyceride, total cholesterol, HDLc and VLDLc. The increased levels of serum triglyceride, total cholesterol, HDLc and VLDLc were observed in epileptic patients on combination therapy of either Phenytoin and Phenobarbitone or Phenytoin and Carbamazepine and monotherapy of Phenytoin alone as compared to normal control. Patients receiving Carbamazepine alone had significant increased serum levels of triglyceride and VLDLc but no significant changes in serum levels of total cholesterol & HDLc were observed in this group as compared to normal control. Several workers reported an increase in tryglycerides in epileptic patients on long-term treatment with phenobarbitone[11,12,13]. Pelkonen *et al.*, Nikkila *et al.* and Luoma *et al*.[7,9,14] reported an increase in tryglycerides, cholesterol and HDLc in epileptics on long-term treatment with Phenytoin. Linvingston S[15] reported an increase in tryglycerides in 35 epileptics on long-term treatment with Carbamazepine. An increase in tryglycerides, cholesterol and VLDLc in epileptics on long-term treatment of anticonvulsant drugs was observed by Reynolds *et al*.[16]. The findings of study are in concordance with the other studies of correlation between duration of anticonvulsant therapy and lipid profile level[7,16,17,18,19]. Combination therapy of either Phenytoin and Phenobarbitone or Phenytoin and Carbamazepine stimulates the hepatic synthesis of cholinesterase[20] and increase the formation and pool size of bile acids, which in turn raise the level of intestinal absorption of cholesterol by facilitating micelle formation. An increase in lipid profile along with hormonal alteration may be regarded as an adverse effect on coronary heart disease and reproductive condition of such patients[21]. Therefore the serum lipid profile level should be regularly monitored in patients undergoing such therapy.

Conclusion

One hundred and twenty patients with epilepsy of both sex male and female who had been on various anticonvulsant drugs were selected for the study of their lipid profile. The increased serum levels of triglyceride, total cholesterol, HDLc and VLDLc in patients receiving combination therapy of either Phenytoin and Phenobarbitone or Phenytoin and Carbamazepine or Phenytoin alone were observed. Patients receiving Carbamazepine alone had significant increased serum levels of triglyceride and VLDLc, but no significant changes in serum levels of total cholesterol & HDLc were found in this group. A significant correlation between duration of anticonvulsant therapy and lipid profile was established. The results indicated the long-term use of anticonvulsant therapy can disturb lipid metabolism with resultant dyslipidema, common recognized risk of atherosclerosis[22] and in female patients with epilepsy metabolic and endocrinal dysfunction a common co-morbid disorder can pose them at risk of reduced fertility[23].It is recommended lipid probile level should be regularly checked in patients undergoing such treatment. This information forms the rationale for future routine screening and correction of such metabolic alteration in epileptic patients.

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Conflict of interest - None

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A study of pseudomonas species isolated from clinical specimen with their antimicrobial sensitivity pattern

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Abstract

This study was conducted to isolate and identify different pseudomonads from various clinical specimens and to determine their antimicrobial sensitivity pattern. The study was conducted from July 2007 to June 2008, for a period of one year at Gauhati Medical College and Hospital. A total of 218 Pseudomonads were isolated and identity was established and confirmed using standard methods. Maximum isolates were from pus(24.72%) followed by Tracheal Swab(22.92%). Of the Pseudomonads maximum were Pseudomonas aeruginosa(92.2%) followed by Burkholderia cepacia(4.13%), Ralstonia pickettii(1.84%) and Pseudomonas putida(1.84%). The isolates were maximally sensitive to Imipenem(88.53%) followed by Piperacillin-Tazobactum(56.88%), these were least sensitive to Cefipime(16.06%).

Introduction

Infectious disease respects no barrier. The war is on against "Microbial Giants" through innovations in "Human Practices" and evolutions in "Antimicrobials". Pseudomonads are such microorganisms, which are making their presence felt with increasing resistance towards even newer antibiotics.

Pseudomonad is composed of members of five genera namely *Pseudomonas, Stenotrophomonas, Burkholderia, Ralstonia and Brevundimonas* of Gram negative, non fermentative bacilli widely distributed in nature as saprophytes or as commensals and pathogens of man, plant and insects[1,2]. All pseudomonads are aerobic, Gram negative bacilli, motile (except *Burkholderia mallei*), Oxidase positive and Catalase positive[1]. In medical microbiology, of the species that are opportunistic pathogen in patients compromised by disease or treatment, *Pseudomonas aeruginosa* is preeminent followed by *Stenotrophomonas maltophila, Pseudomonas fluorescencs, Pseudomonas putida, Burkholderia cepacia, Ralstonia pickettii* and *Pseudomonas stutzeri*[1,2].

There are several reasons for the preeminence of *Pseudomonas aeruginosa* as the human pathogen like adaptability, innate resistance to many antibiotics, armoury of putative virulence factors and lastly, Increasing number of patients compromised by age, underlying disease or immunosuppressive therapy[3] It is also the most common pathogen associated with the morbidity and mortality in the cystic fibrosis cases and underlying respiratory diseases causing chronic lung infection other being *Burkholderia cepacia*[4-7]. Potential therapies for *B. cepacia* and *B. pseudomallei* are provided but antibiotic therapy rarely eradicates *B. cepacia* from the respiratory tract of patients with cystic fibrosis and the optimum therapy for melioidosis remains controversial[8-11]. *Pseudomonas aeruginosa* also readily acquires resistance to potentially active agents, necessitating that agent selected be tested against each clinically relevant isolate. With the above perspective the present study on Pseudomonas was taken up in the department of Microbiology, Gauhati Medical College & Hospital, Guwahati with following aims and objectives.

Materials and methods

Specimens for this study were collected from a variety of clinical sources from both indoor, ICU ands outdoor patients attending Gauhati Medical College & Hospital, Guwahati. Samples of sputum, throat swab, pus, aural swab, tracheal swab and catheter tips were collected from patients using aseptic techniques. Midstream urine samples were collected aseptically in sterile containers, for pus sterile swabs were used. The samples were plated on Mac Conkey medium and 10% blood agar and incubated overnight at 37°C. Those samples showing the growth of non-lactose fermenting moist colonies were processed further. Finally, the samples yielding Pseudomonads were taken up in the study. For urine plates showing a growth of 10^5 CFU/ml(as per Kass count) were further processed, colonies less than 10^5 CFU/ml were considered in patients with history of antibiotic therapy, fever, catheterization, urinary abnormality and immunucompromised state. All the isolated pseudomonas strains were tested against different anti-microbial agents by modified Kirby-Bauer (Bauer et al., 1966) method[12,13]. Commercially available antibiotic discs were used which were procured from Himedia Laboratories Ltd, Mumbai-400086. The isolates were tested against the following battery of antibiotics namely Imipenem (10mcg), Ciprofloxacin (5mcg), Piperacillin+Tazobactum (100/10mcg), Amikacin (30mcg), Gentamicin (10mcg), Ceftazidime (30mcg), Cefoperzone (75mcg), Cefipime (30mcg).

Results

A total number of 3720 samples from varied clinical sources were collected and screened. Of these a total of 218

samples yielded Pseudomonads. Of the total 3720 samples screened the maximum samples were from urine (57.74%) and the least were from Tracheal Swab (1.29%). {Table 1}

Of the 3720 samples screened, the rate of isolation of Pseudomonas species was the highest from pus (24.72%), followed by Tracheal swab (22.92%) and lowest from urine (3.26%) (Table 2).

Four species of pseudomonads were identified among the 218 isolates, *Pseudomonas aeruginosa* (92.20%) was maximally isolated, followed by *Burkholderia cepacia* (4.13%), *Pseudomonas putida* and *Ralstonia pickettii* (1.83%) each(Table 3). *Pseudomonas aeruginosa* (91.78%) was the species isolated in highest numbers in sputum, followed by *Burkholderia cepacia* (5.48%) (Table 4). *Pseudomonas aeruginosa* (95.71%) was the dominant species isolated from urine, followed by *Pseudomonas putida* (2.86%) (Table 5). *Pseudomonas aeruginosa* (88.64%) was the dominant species isolated from pus samples followed by *Burkholderia cepacia* (6.82%) (Table 6). *Pseudomonas aeruginosa* (72.73%) was the dominant species isolated from the Tracheal Swab (Table 7).

Imipenem was the most effective antibiotic against Pseudomonads with (88.53%) isolates being sensitive to it followed by Piperacillin-Tazobactam (56.88%), Amikacin (46.33%), Ciprofloxacin (43.12%) and Gentamicin (34.86%) (Table 8). *Pseudomonas aeruginosa* was maximally sensitive to Imipenem (89.05%), followed by Piperacillin-Tazobactam (56.72%) (Table 9). *Pseudomonas putida* isolates were most sensitive to Imipenem (75%) followed by Piperacillin-Tazobactam (50%) (Table 10). *Burkholderia cepacia* isolates were mostly sensitive to Imipenem (77.8%) followed by Piperacillin-Tazobactam (55.6%) and Amikacin (44.4%) (Table11). *Ralstonia pickettii* isolates showed 100% sensitivity to Imipenem, followed by Piperacillin-Tazobactam (75%) (Table 12).

Table 1: Shows the breakup of clinical samples which were processed in the laboratory.

Source of samples	No. of samples	%
Urine	2148	57.74%
Sputum	1061	28.52%
Throat swab	220	5.91%
Pus	178	4.79%
Aural swab	65	1.75%
Tracheal swab	48	1.29%
Total	3720	100%

Table 2: Isolation rate of Pseudomonas species from various specimens

Sample source	Screened samples (No.)	Pseudomonas species isolated(No.)	%
Urine	2148	70	3.26%
Sputum	1061	73	6.88%
Throat Swab(T/S)	220	8	3.64%
Pus	178	44	24.72%
Aural Swab(A/S)	65	12	18.46%
Tracheal Swab	48	11	22.92%
Total	3720	218	100%

Table 3: Species distribution of 218 Pseudomonas species.

Species isolated	No.	%
Pseudomonas aeruginosa	201	92.20%
Pseudomonas putida	4	1.84%
Burkholderia cepacia	9	4.13%
Ralstonia pickettii	4	1.84%
Total	218	100%

Discussion

In this study 218 (5.86%) clinically relevant isolates of Pseudomonads were isolated from 3720 different clinical samples (Table 2). Shenoy et al. (2002)[14] reported an isolation rate of 31.52% *Pseudomonas aeruginosa* from various clinical specimens while Elmanama et al. (2006)[15] and Ullmann et al. (1980)[16] reported an isolation of 14.9% and 12.5% for pseudomonads from various clinical specimens.

In the present study, highest isolation rate of pseudomonas species was from pus (24.72%) (Table 2), similar isolation rates of 27% and 28% were reported by Rhodora (1988)[17] and Ndip et al. (2005)[18]. High isolation rate of 64% from pus was reported by Elmanama et al. (2006)[15]. The second highest isolation rate (22.9%) was observed from tracheal swabs (Table2), similar isolation rates of 19.59% and 20% from tracheal swabs were reported by Ergin et al. (1999)[19] and Shenoy et al. (2002)[14] respectively. In this study the isolation rate from aural swabs was 18.46% (Table 2)

Table 4: Species distribution in 73 samples of sputum.

Species isolated	Number of isolates	%
Pseudomonas aeruginosa	67	91.78%
Burkholderia cepacia	4	5.48%
Ralstonia pickettii	2	2.74%
Total	73	100%

Table 5: Species distribution in 70 samples of urine.

Species isolated	Number of isolate	%
Pseudomonas aeruginosa	67	95.71%
Burkholderia cepacia	1	1.43%
Pseudomonas putida	2	2.86%
Total	70	100%

Table 6: Pseudomonas species isolated from 44 samples of pus.

Species isolated	Number of isolate	%
Pseudomonas aeruginosa	39	88.64%
Burkholderia cepacia	3	6.82%
Ralstonia pickettii	1	2.27%
Pseudomonas putida	1	2.27%
Total	44	100%

Table 7: Pseudomonas species isolated in 11 samples of Tracheal Swab.

Species isolated	Number of isolate	%
Pseudomonas aeruginosa	8	72.73%
Burkholderia cepacia	1	9.09%
Pseudomonas putida	1	9.09%
Ralstonia pickettii	1	9.09%
Total	11	100%

Table 8: Antimicrobial Sensitivity pattern of 218 Pseudomonas species.

Antibiotic	Sensitive (No. / %)	Resistant (No. / %)
Ciprofloxacin	94 (43.12%)	117 (53.67%)
Imipenam	193 (88.53%)	25 (11.47%)
Piperacillin-Tazobactum	124 (56.88%)	76 (34.86%)
Ceftazidime	54 (24.77%)	158 (72.48%)
Cefoperazone	54 (24.77%)	157 (72.02%)
Amikacin	101 (46.33%)	110 (50.46%)
Gentamicin	76 (34.86%)	131 (60.09%)
Cefipime	35 (16.06%)	175 (80.28%)

however Rhodora (1988), reported a lower isolation rate of 8% from ear discharge[17]. In this study the isolation rate from sputum was 6.88% (Table 2), similar isolation rate of 7% and 8% from sputum were reported by Elmanama et al. (2006)[15] and Rhodora (1988)[17] respectively while a slightly higher isolation rate of 11.27% and 16% were reported by Ergin et al. (1999)[17] and Ndip et al. (2005)[18] respectively. In this study the isolation rate of pseudomonads from urine was 3.26% (Table 2), similar isolation rate of 1.97% and 5.3% from urine were reported by Ergin et al. (1999)[19] and Hasan et al. (2007)[20] respectively while a high isolation rate of 34.9% and 30% was reported by Shenoy et al. (2002)[14] and Ndip et al. (2005)[18] respectively. Among the pus samples the highest isolation rate was from pus of burn cases (45.45%) [not shown in table], similar isolation rate of 57% and 64.82% from burn cases were reported by Estahbanati (2003)[21] and Shenoy et al. (2002)[14].

Species distribution of Pseudomonas

In this study, *Pseudomonas aeruginosa* was the predominant species isolated at 92.90% (Table 5), similar isolation rate of 91.67% and 85.65% for Pseudomonas aeruginosa was reported by Ergin et al. (1999)[19] and Blazevic (1973)[22]. In this study, isolation rate of 4.13% was seen for *Burkholderia cepacia* (Table 5), similar isolation rates ranging from 3.1% - 5.21% was reported by Ergin et al. (1999)[19], Suzuki et al. (1995)[23] and Holmes B (1986)[24]. *Burkholderia cepacia* were isolated from sputum, urine, pus and tracheal swab (Table 6-9), similarly Perera et al. (2000)[25] reported isolating *Burkholderia cepacia* from sputum, chronic ulcers, endotracheal aspirates and urine. An isolation rate of 1.83% was found for *Pseudomonas putida,* in the present study (Table 5), similar isolation rates of

Table 9: Sensitivity profile of *Pseudomonas aeruginosa* (n=201)

Antibiotic	Sensitive (No./%)	Moderately sensitive (No./%)	Resistant (No./%)
Ciprofloxacin	90 (44.78%)	6 (2.99%)	105 (52.23%)
Imipenam	179 (89.05%)	0 (0%)	22 (10.95%)
Piperacillin-Tazobactam	114 (56.72%)	17 (8.46%)	70 (34.43%)
Ceftazidime	50 (24.88%)	6 (2.99%)	145 (72.14%)
Cefoperazone	51 (25.37%)	7 (3.48%)	143 (71.14%)
Amikacin	94 (46.77%)	7 (3.48%)	100 (49.75%)
Gentamicin	70 (34.83%)	9 (4.48%)	122 (60.69%)
Cefipime	33 (16.42%)	8 (3.98%)	160 (79.60%)

1.04% and 1.01% for *Pseudomonas putida* were reported by Ergin et al. (1999)[19] and Suzuki et al.(1995)[23] while higher isolation rate of 7.8% was reported by Blazevic et al. (1973)[22]. In this study, 4 (1.83%) *Ralstonia pickettii* were isolated (Table 5). All the isolates came from patients of lower respiratory tract infection, 2 from sputum, 1 from pus of empyema thoracis and 1 from tracheal swab of pneumonia case admitted to ICU (Table6-9). In the present study *Pseudomonas putida* were isolated from urine, pus and tracheal swab (Table 7-9). Similarly isolation of *Pseudomonas putida* from urine was reported by Sutter et al.[26].

Antibiotic sensitivity pattern

In this study Imipenem was the most effective antibiotic against Pseudomonas aeruginosa with only 10.95% isolate showing resistance to it (Table 11), similar resistance of Pseudomonas aeruginosa of 9.6% and 13% was reported by Muller-Premru et al. (2000)[27] and Carmelli et al. (1999)[28] respectively. In this study resistance to Ciprofloxacin was found to be 52.33% (Table 11) while lower resistance rates of 8.3% and 26.1%were reported by Ergin et al. (1999)[19] and Elmanama et al. (2006)[15] and respectively. 49.77% of pseudomonas isolates were found to be resistant to Amikacin (Table 11) as compared to 39.9%, 34.9% and 31.99% reported by Muller-Premru et al. (2000)[27], Elmanama et al. (2006)[15] and Shenoy et al. (2002)[14] respectively. High resistance of 60.69% was found for Gentamicin (Table 11) as compared to 51% and 44.13% reported by Muller-Premru et al. (2000)[20] and Shenoy et al. (2002)[14] respectively. In the present study 72.14% isolates were resistant to Ceftazidime (Table 11) while Elmanama et al. (2006)[15], Ergin et al. (1999)[19] and Shenoy et al. (2002)[14] reported lower resistance rates of 35.8%, 13.3% and 42.92% respectively. 71.14% Pseudomonas aeruginosa isolated were resistant to Cefoperazone (Table 11) as compared to 44.13% reported by Shenoy et al. (2002)[14]. In this present study, *Pseudomonas aeruginosa* showed high resistance rates of 34.43% and 79.60% for Piperacillin-Tazobactam and Cefipime respectively (Table 11) as compared to 0.8%(Piperacillin-Tazobactam) and 11.6% (Cefipime)

Table 10: Sensitivity profile of *Pseudomonas putida* (n=4)

Antibiotic	Sensitive (No./%)	Moderately sensitive (No./%)	Resistant (No./%)
Ciprofloxacin	0 (0%)	0 (0%)	4 (100%)
Imipenam	3 (75%)	0 (0%)	1 (25%)
Piperacillin-Tazobactam	2 (50%)	0 (0%)	2 (50%)
Ceftazidime	0 (0%)	0 (0%)	4 (100%)
Cefoperazone	0 (0%)	0 (0%)	4 (100%)
Amikacin	1 (25%)	0 (0%)	3 (75%)
Gentamicin	1 (25%)	0 (0%)	3 (75%)
Cefipime	0 (0%)	0 (0%)	4 (100%)

Table 11: Sensitivity profile of *Burkholderia cepacia* (n=9)

Antibiotic	Sensitive (No./%)	Moderately sensitive (No./%)	Resistant (No./%)
Ciprofloxacin	3 (33.3%)	1 (1.1%)	5 (55.6%)
Imipenam	7 (77.8%)	0 (0%)	2 (22.2%)
Piperacillin-Tazobactam	5 (55.6%)	1 (1.1%)	3 (33.3%)
Ceftazidime	3 (33.3%)	0 (0%)	6 (66.7%)
Cefoperazone	2 (22.2%)	0 (0%)	7 (77.8%)
Amikacin	4 (44.4%)	0 (0%)	5 (55.6%)
Gentamicin	3 (33.3%)	2 (22.2%)	4 (44.4%)
Cefipime	2 (22.2%)	0 (0%)	7 (77.8%)

resistance reported by Varsha Gupta et al. (2006)[29]. In this study, 77.8% *Burkholderia cepacia* were sensitive to Imipenem (Table 13) higher sensitivity rate of 84% and 91% was reported by Wen-Liang Yu et al. (1999)[30] and Eugenia et al. (1997)[31].

There were only 9 isolates of Burkholderia cepacia and 4 isolates each of *Pseudomonas putida* and *Ralstonia pickettii*, in this study (Table 5) were isolated in this study and this is too small a number to comment on the sensitivity and resistant rates of these two microorganisms although Blazevic et al. (1972), reported 100% sensitivity of *Pseudomonas putida* to Gentamicin[22] while in this study 100% resistance to Gentamicin was seen (Table 12). *Ralstonia pickettii* has been implicated in hospital outbreaks[32], *Ralstonia pickettii* can also contaminate intravenous solutions leading to nosocomial outbreaks [33,34].

Conclusion

The clinical significance of pseudomonads has increased over the years from being environmental contaminant to important agent of community acquired infections and life threatening nosocomial infections. As the invasive procedures are increasing so are the pathogens as agents causing nosocomial infections. It is seen that the species like *Burkholderia cepacia* which were once isolated in special disease conditions are now being isolated more frequently and from more varied clinical specimen.

Table 12: Sensitivity profile of *Ralstonia pickettii* (n=4)

Antibiotic (No./%)	Sensitive (No./%) (No./%)	Moderately sensitive	Resistant (No./%)
Ciprofloxacin	1 (25%)	0 (0%)	3 (75%)
Imipenam	4 (100%)	0 (0%)	0 (0%)
Piperacillin-Tazobactam	3 (75%)	0 (0%)	1 (25%)
Ceftazidime	0 (0%)	0 (0%)	4 (100%)
Cefoperazone	1 (25%)	0 (0%)	3 (75%)
Amikacin	1 (25%)	1 (25%)	2 (50%)
Gentamicin	1 (25%)	0 (0%)	3 (75%)
Cefipime	0 (0%)	0 (0%)	4 (100%)

Pseudomonads like *Pseudomonas putida* and *Ralstonia pickettii* once considered innocent bystanders are now increasingly isolated from clinical specimen. Pseudomonads are widespread in environment and when organisms like *Ralstonia pickettii, Burkholderia cepacia* and *Pseudomonas putida* are isolated it becomes difficult to distinguish between etiological agent and environment contaminant. In the present study 5.86% samples yielded pseudomonas species, signifying that the prevalence of pseudomonas species is low in Gauhati Medical College and Hospital but the problem lies in the fact that the organism is more resistant to many common antimicrobials. Frequent hand washing is essential in limiting environment to patient, staff to patient and patient to patient transmission of pseudomonas species. Of greater importance is the formulation of hospital antibiotic policy, so that a rational and justifiable antimicrobial use can be achieved.

Thus taking into consideration the prevalence of pseudomonas species in the hospital environment and their capacity to grow in most formidable conditions, a continuous surveillance and regular update of their antibiotic susceptibility pattern are essential for maintaining good infection control.

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