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Editorial

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Geriatrics — A New Horizon In The Medical Sciences

The term Geriatrics – a Greek word is a combination of Geron means 'Old man' and Iatros means 'Heaven'. Hence Geriatrics or Geriatric medicine or medical Gerontology in a speciality that takes care of the health of elderly people; and the physicians who got specialised in this subject are called Geriatrician or Geriatric physicians.

Man born to die, crossing the different stages in life journey like baby crawls to child, child jumps as boy who becomes young in time to reach the stage of pre old then old and ultimately very old one. With the progress of civilisation and advent of modern medical facilities, consciousness of the humanity regarding food and life style, life expectancy throughout the world in increased to the maximum and still increasing. People in Minnesota live the longest in United States average 78.7 years and the oldest verified man in the world Massazo Nonoka of Japan is of 113 years old but he left us for heavenly abode a few months back.

Who are called older people or Geriatrics? Above 65 years is often called the older people but most people do not need geriatric care until the age of 70 or 75 years. It is the study of aging including biological, biochemical, sociological and psychological changes of the older age groups. Life expectancy of an additional 17 years at the age of 65 years, additional 10years at the age 75 years for men; and 20years at 65 years of age, 13 years at the age of 75 years for women are desirable after geriatric care. Overall women live 05 years longer than men, probably because of genetic, biologic and environmental factors.

In contrast to common belief that the management of the fragile age to be done by the different specialities as per need like Cardiologist, Palmologist, Orthopadicians, Eye specialist, Psychologist, Dentist etc, this group of old aged to be tackled by a separate specialist – the Geriatric Physician like the Paediatricians who treat the children only.

History :

In the medieval Islamic world, several physicians wrote on issues related to Gerontology. The Canos Medicine (1025) offered instruction for care of aged including diet and problems like constipation. Arabic physician Ibu Al Jazzen wrote on the aches and the conditions of elderly. His scholarly work covers sleep disorder, forgetfulness and to combat the causes of mortality. Some early pioneers such as Michel Eugene Chevreul who himself lived up to 102 years believed that aging itself should be a science to be studied and Elie Metchnikaff coined the term Gerontology in 1903. Modern pioneers like James Baren began organising Gerontology as its own field in 1940's, (later in starting U.S. Government started a course on Ageing in the University of Southern California and University of California, Los Angeles). He established Gerontological society of America in 1940.

Population over 60 years in expected to be more than 22% of the world population by 2050. The term geroscience emerge in the 21st century. In 1900 there were 3.1 million people aged 65 years and more living in U.S., but now it has reached 31.1, 35, and 43 million in 1990, 2000 and 2010. When total population increased 9.7% in 2000 to 2010, then persons of old and older age increased by 15.1% during the same period. It is predicted that by 2050 the number of old aged will be greater than number of children aged 0 to 14 years in U.S.

Geriatric Care Management :

It is the process of planning and co-ordinating care of the elderly with physical and/or mental impairment to meet their long term care need, improvement of quality of life and to maintain their independence as long as possible. Geriatic care managers accomplish this by combining a working knowledge of health and psychology, human development, family dynamics, public and private resources as well as funding resources, while advocating for their clients throughout the continuum of care.

Difference between Adult and Geriatric Medicine :

Geriatrics focuses on unique need of elderly persons as during old age decline of the various organ system manifests. For example, renal impairment may be a part of aging but enlarged prostate, renal failure and incontinence are not.

Geriatric Giants :

These are major categories of impairment that appear in elderly immobility, instability, in continence, impaired intellect/ memory, impaired vision and hearing loss etc.

Old one suffers from many age related ailments, which are tackled by different kind of specialists.

A. Medical :

(1) Carcinogenic
(2) Geriatric dentistry
(3) Diagnostic imaging
(4) Geriatric emergency medicine
(5) Geriatric nephrology
(6) Geriatric nephrology
(7) Geriatric oncology
(8) Geriatric pharmacotherapy
(9) Geriatric psychiatry
(10) Public health - Disease prevention and health promotion in elderly
(11) Geriatric rehabilitation
(12) Geriatric haematology
(13) Geriatric sexology
(14) Subspecialty –

(I) Assessment clinic
(II) Fall and balance clinic
(III) Pain clinic

B. Surgical :

(1) Ortho geriatrics
(2) Geriatric cardiothoracic surgery
(3) Geriatrics Urology
(4) Geriatrics ortorynnology
(5) Geriatric general surgery
(6) Geriatric ophthalmology
(7) Geriatric anaesthesia
(8) Geriatric intensive care unit
(9) Geriatric nutrition and nursing
(10) Geriatric occupational therapy
(11) Geriatric podicity
(12) Geriatric physical therapy
(13) Geriatric speech and language therapy
(14) Geriatric mental health
(15) Geriatric audiology

Geriatric Training :

USA - In USA Geriatricians are primary care physician – D.O. or MD, who are board certified either in family medicine on internal medicine and have certificates of added qualification (CAS) in Geriatric Medicine.

U.K. - In U.K. it is now a distinct clinical entity and has been integrated as a specialisation of General medicine since last 1978s. In contrast to U.S. it is a major speciality in U.K.

CANADA – In Canada there are two paths to become a Geriatric Physician.

1. A Doctor of Medicine (M.D) – after completion of 3 years internal medicine residency training have to undergo 2 years specialised Geriatric residency training in Royal College of physician and surgeon of Canada to become Geriatric Physician.

2. A Doctor of Medicine opted for 2 years residency programme in family medicine and then complete 1 year enhanced skilled programme in the care of elderly by college of family physician in Canada to become a Geriatric physician.

INDIA – In India, Geriatrics is a new speciality offering 3 years post graduate residency M.D. training after completion of 5.5 years under graduate training of M.B.B.S. Unfortunately only four institutions promotes M.D. in Geriatric Medicine.

Editorial

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Acute encephalitis syndrome — an unsolved mystery !

Acute encephalitis syndrome (AES) can be defined as an acute onset of fever with change in mental status (confusion, disorientation, inability to talk, coma) and/ or new onset seizures (excluding simple febrile seizures).

Japanese encephalitis virus (JEV) is the leading diagnosed cause of acute encephalitis, others being enteroviruses, scrub typhus, measles and other viruses circulating in the local area. In many cases, however, no etiological agent is determined, and such cases are categorized broadly as acute encephalitis syndrome (AES).

Between 2008 and 2014, there have been more than 44,000 cases and nearly 6000 deaths from encephalitis in India, particularly in Uttar Pradesh and Bihar. In 2016, there has been a rise in encephalitis, with over 125 children reported to have died in one hospital in Gorakhpur alone.

The last decade has seen a rise in the incidence of unexplained illness in form of outbreaks of sudden neurological deterioration and a high mortality especially among children in the district of Muzaffarpur and adjoining areas.

The first recorded incidence of the mystery illness started in 1995. The outbreaks coincide with the harvesting season of Litchi (mid-May and early June), a seasonal fruit of this region. The affected children mostly belonged to poor socio-economic backgrounds with clinical features usually starting in the early morning period.

The data at Sri Krishna Medical College & Hospital, Muzaffarpur from the year 2012-2018 reported 814 admissions with AES of which there were 292 (35.8%) deaths. Few cases (35) of Japanese encephalitis were also discovered during the period with fatality in 8 cases.

There have been many theories of possible etiological factors including infectious encephalitis, exposure to pesticides and consumption of Litchi but none of these have been proven to be the causative factors.

In 2011, there were 147 cases and 54 deaths in the district. In the following year, 469 cases and 178 deaths were reported from health facilities with CFR of 38.6 per cent. The age of the hospitalized cases ranged from six months to 16 yr. with 92 per cent below the age of 10 year. Fifty three per cent were females.

In 2014, NCDC and CDC investigated this illness with Hospital based clinical surveillance, epidemiological case control study, comprehensive lab testing to study the role of etiological agents like naturally occurring toxins, pesticides, infectious pathogens and toxic elements.

Between May 26, and July 17, 2014, 390 patients meeting the case definition were admitted to the two referral hospitals in Muzaffarpur. Among these, 213 (55%) were boys, median age was 4 years (range 6 months-14 years), and 280 (72%) were aged 1-5 years. Most patients (273; 70%) were from Muzaffarpur district; cases were reported from all 16 blocks of Muzaffarpur district. Clustering of cases was not observed; each affected child seemed to be an isolated case in a village (approximate population per village 2500). The outbreak peaked in mid-June, with 147 cases reported during June 8-14, 2014, and declined substantially after June 21, 2014.

Caregivers reported that affected children were previously well and 366 (94%) had sudden onset of symptoms less than 24 h before admission. Further, 224 (66%) of 342 patients with recorded data reported illness onset between 0300 h and 0800 h. Of patients with recorded data, 326 (94%) of 348 reported one or more seizures and 345 (95%) of 362 reported altered mental status before admission; 301 (87%) of 347 patients were unconscious on presentation.

Of 357 patients with recorded admission measurements, the median temperature was 37.2°C (99°F; range 35.6–40.6), and 219 (61%) were afebrile (≤37.5°C [≤99.5°]). Among 386 patients with recorded data, 122 died (case fatality rate 32%).

On detailed clinical assessment of 52 patients, 48 (92%) showed no focal neurological deficits. Brain MRI of 16 patients showed no focal lesions, signal abnormalities, or changes suggestive of inflammation; eight patients (50%) showed mild to moderate cerebral oedema. Clinical severity did not noticeably differ between participants with and without cerebral oedema. EEG in 30 cases showed findings consistent with generalised encephalopathy in 22 (73%); seven showed epileptiform discharges. Of 62 patients with CSF collected for analysis, 52 (84%) had normal WBC counts (<0.5×10^6 cells per L), 58 (94%) had normal protein (<450 mg/L), and 49 (79%) had normal glucose (>2.50 mmol/L) concentrations. Of 327 patients with blood glucose measurement on admission, the median blood glucose level was 2.66 mmol/L (range 0.44–23.98), and 100 (31%) patients had glucose concentration of 1.67 mmol/L or less, 171 (52%) patients had glucose concentration of 2.78 mmol/L or less, and 204 (62%) patients had glucose concentrations of 3.89 mmol/L or less. Of 349 patients with available information, 239 (69%) had a record of receiving dextrose therapy during hospital stay; of these, 173 (73%) survived.

Exposures that were significantly associated with illness included litchi consumption, visiting a fruit orchard, and absence of an evening meal (defined as eating the last [non-litchi] meal before 1900 h.

Among those who consumed litchis, cases were more likely to eat unripe litchis, eat rotten, report eating litchis from the ground versus from the tree and report eating partially eaten litchis.

No association was noted between illness and consumption of raw vegetables or medications, drinking water source, or exposure to insecticides or chemicals sprayed in and around the house or nearby fields or orchards .

The absence of an evening meal in the previous 24 h significantly modified the relation between litchi consumption and illness.

At NCDC, laboratory diagnostic testing of 17 CSF specimens for Japanese encephalitis virus and West Nile virus by PCR, and an additional 12 CSF specimens with an 11-virus multiplex PCR platform assay were negative. All other samples were negative for all assays tested.

Among 73 case-patient urine specimens assessed, 47 (64%) contained metabolites of hypoglycin A (MCPA-Gly), 33 (45%) contained metabolites of MCPG (MCPF-Gly), and 32 (44%) specimens contained both metabolites.

On assessment, 67 (89%) of 75 specimens showed abnormal urinary organic acid profiles and 72 (90%) of 80 specimens had abnormal plasma acylcarnitine profiles, consistent with severe disruption of fatty acid metabolism.

Of 36 litchi arils analysed from Muzaffarpur, observed concentrations ranged from 12.4 µg/g to 152.0 µg/g hypoglycin A and 44.9 µg/g to 220.0 µg/g MCPG. Within each batch tested, the unripe fruit contained higher concentrations of both MCPG and hypoglycin A than did the ripe fruit.

Children in Muzaffarpur frequently spend the day eating litchis and some skip the evening meal. Skipping evening meal, by itself results in low blood sugar levels during the night. This is particularly so in the case of young children as they have limited hepatic glycogen reserves. Hypoglycin A and methylenecyclopropylglycine (MCPG), which are naturally present in litchi fruit, make the condition worse. The toxins block enzymes involved in normal glucose metabolism and this results in an inability to synthesis glucose leading to acutely low level of blood sugar. The build-up of other metabolic by-products could also have an adverse effect (encephalopathy) on the child.

The recommendations following the investigations recommended that litchi consumption should be minimised in young children, avoid skipping evening meals and a rapid hypoglycaemia correction on presentation should be implemented.

However, some unexplained questions still remain like absence of clustering, presentation in infants who are too young to consume litchi and an absence of fever.

Over the last two years, number of cases presenting has reduced significantly. There is still a mystery over the real causative factor leading to the epidemics. There is need for further research and investigation to ascertain the real cause of the illness.

Original Article

Out break of coma epidemic in children in Muzaffarpur, Bihar — Mystery or missed diagnosis

Gopal Shankar Sahni[1]

In the month of June 2005 and June 2011, there was an outbreak of fever with convulsion and coma [Acute Encephalopathy Syndrome (AES)] occurred in children in Muzaffarpur district of Bihar. About 500 children were affected and more than 200 died. The outbreak of acute encephalopathy syndrome among children were investigated to confirm the etiology and describe clinico-epidemiological feature. A retrospective study involving 50 patients of AES admitted to S K Medical College, Muzaffarpur in June 2005 and June 2011 was carried out. These patients presented with a rectal temperature of >40°C and central nervous system disturbance. The patient were treated with standard regimen of management of acute encephalopathy syndrome and sponging in ICU. The main presenting feature were fever (100%), convulsion (100%), unconsciousness (100%), decebrate rigidity (50%), tachycardia (80%), tachypnea (80%) and no splenomegaly. Serum and CSF were tested for IgM antibodies and RT-PCR against Chandipura virus (CHPV), Japanese encephalitis virus (JE) and Nipah virus. A total of 50 AES cases were recorded in children <12 years of age. Case fatality ratio was 60%. Male to female ratio was 1:1.5. There was no evidence of any infective etiology. All patient were negative of IgM and PCR of CHPV, JE and Nipah virus. As heat hyperpyrexia is a diagnosis of exclusion, It include such as drug withdrawal syndrome, neuroleptic malignant syndrome, septicemia, cerebral malaria, CNS infection, thyroid storm, drug toxicity (anticholinergic). So the outbreak of acute encephalopathy syndrome may be due to heat hyperpyrexia.

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Key words **: Classical heat stroke, clinicopathological aspect, potentially fatal, rapid cooling.**

In the month of June 2011, most of parts of Muzaffarpur district (Bihar) and few neighbouring district witnessed a large outbreak of mysterious illness that killed more than 50 children over a span of 15 days[1]. About 35 patients were admitted in SK Medical college Muzaffarpur with death toll about 18[1]. This type of disease occur every year in this area in May-June depending upon environmental temperature and humidity. In the history of Muzaffarpur the most severe epidemic occur in 1995 and 2005 when more than 500 and 100 death occur respectively. This outbreak occurs when environmental temperature approachs 38°C-44°C and remain sustained for 3 to 4 days. This outbreak is 100% associated with high environmental temperature and humidity.

- **Heat stroke is presented as acute encephalitis syndrome and is a multi system disorder**
- **Heat stroke is the diagnosis of exclusion.**
- **Its incidence is increasing with increasing global warming.**
- **It is inherently preventable, fatality warranting a high index of clinical suspicion in appropriate setting. Treatment of heat stroke should be prompt as the incidence of severe complication is related to degree of hyperpyrexia and duration of exposure to hyperpyrexia and shock.**
- **Public perception of hazards of heat stroke is often poor and underplayed by public media and even the medical community.**
- **The recurrence of such an epidemic is likely to be avoided only with aggressive implementation of a community-wide disaster plan. This emphasizes the need for education at all level of medical care in conjunction with an aggressive prehospital prevention and rescue plan when faced with this type of environmental catastrophe.**

Material and Method

Study area- the study area in India is located between 26° and 26.07°N and 85° and 85/.45°E. The cases were reported from different block of Muzaffarpur like Meenapur, Kanti, Bochahan, Aurai, Gayaghat and Musshari and also from and joining district like Sithamadhi and sheohar. This region lies at an altitude of approximately 60 metre above mean sea level. The population is mostly rural. Average annual rain fall is 11.87 cm. The climatic condition in May – June is extremely hot and humid the temperature ranges from 28°C to 40-44°C and humidity may goes upto 100%.

Patients and clinical specimens- a case was defined as a hospitalized cases (in June 2005 and in June 2011), age 2 to 12 years, with acute onsets of fever with central ner-

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vous system involvement (convulsion, unconsciousness, decerebrate rigidity and coma) and negative test for malaria, tuberculosis and other common bacterial causes. Outbreak investigations was initiated immediately after cerebrospinal fluid (CSF) and blood samples were sent to National Institute of virology Pune, by Directorate of Health Services, Bihar. Predesigned proforma was used to collect information from the cases. Clinical investigations included recording history, clinical findings and result of routine laboratory investigations, review of hospital records and collection of CSF and/or blood from patients. Acute CSF and/or serum specimen were tested for anti-JEV, anti-CHPV and anti-Nipah IgM antibodies using enzyme-linked immunosorbent assay (ELISA). Detection of RNA of these viruses was done by RT-PCR in acute serum sample and CSF according to the method described earlier.

Observation

Discription of this disease outbreak in Muzaffarpur.

Presenting Feature :

- All patients were between 2 to 12 years of age.
- Patient present with sudden attack of convulsion, followed by coma, decebrate rigidity, opistonous posture, cerebellar dysfunction, dystonia and death.
- Death comes within 36 hours of hospitalization.
- More alarmingly some patient died within 5 to 10 hours of attack of convulsion.

Examination

- All patients (100%) have fever >104°F.
- 80% patients presents with hot, dry skin and absence of sweating.
- All patients (100%) comes with status either in the form of persistence of convulsion for more than 30 minutes or a series of convulsion occur without regaining consciousness.
- All (100%) patients were comatose.
- 50% patients have decebrate rigidity.
- 40% patients have irregular respiration.
- 30% patients have absent dolls eye reflex.
- Some patients have heart rate greater than 120 to 140.
- No any patients have splenomegly.
- Some patients show sign of dehydration.
- Blood pressures were low and normal.
- 30% patients have oculogyric crisis.
- 50% patients have no response planter reflex.
- 50% patients have absent tendon reflex.
- 50% patients have flaccidity.
- No any patients have sign of meningeal irritation.

Investigation

Hematological — (80%), patients had leucocytosis (13000-17000/cu mm) with neutropilia (75-80%).

Biochemical Investigation — Hyponatremia (90%), Hypokalemia (5%), mild raised SGPT (50-100IU/L)(30%), mild raised blood urea (40-50mg/dl)(40%) and normal creatinine. Smear for malarial parasites were negative. ECG showed non-specific ST changes and tachyarrhythemia. Lumber puncture and CSF examination done within 24 hours of admission. The CSF was 100% normal but under raised pressure. CSF and serum was sent to national institute of virology Pune for detection of three virus-chandipura, Nipah and JE, but all are negative by Elisa for IgG and IgM and by PCR. Plasma enzyme (CPK, AST) done in 25 cases all are under normal. Coagulation screen was not done because no patient has bleeding tendency

Difference Between Encephalitis and the Current Illness :

On the basic of history, clinical examination and laboratory finding these patient seem to be not suffering from encephalitis. There is major epidemological, clinical and lab finding difference between current illness and encephalitis.

(A) Epidemological Diffrence

- Japanese Encephalitis (JE) occurs mostly in monsoon and post monsoon months (July to Sept), but this disease occur in May – June[2]
- The vector of JE culex mosquito which breeds in flooded rice field, marshes and standing water and field. So JE occur in rainy season which is favorable time for reproduction of cluex mosquito[3], but this disease occur in may – June, in that time there is high environmental temperature which may reach up to 38°C to 42°C. At that temperature the mosquito do not survive, so there is no chances of JE outbreak in this season of high temperature.
- JE mostly occur where pigs are found in residential area because pig is the amplifier host of this virus but this illness is not related to pig residing area. Countries that do not rear pig like Pakistan had JE only very rarely[4].
- During epidemic of JE the adult population may also be suffered but this disease occurs Almost Exclusively in children of age group 2 to 15 years. Not single cases of adult were found.
- The outbreak of JE usually not occur each year in same area, but this illness occur each year in this area in May-June when environmental temperature approaches 38°C to 42°C

- In JE, the sibling almost never affected but in this illness sibling affected mostly.

(B) Clinical Diffrence :

- A typical case of JE present with (i) prodromal stage (1 to 3days) of fever, headache, nausea, diarrhea, vomiting and myalgia.
- Encephalitis stage (3 to 4 days) : There is CNS manifestation of convulsion, coma, focal neurological sign and death[5].
- Convalescence stage - There is defervescene of fever and neurological improvement. But this illness present with convulsion followed by neurological sign and death. There is No Any Prodromal symptom at all.
- In JE some patient may have sign of meningeal irritation like neck rigidity, brudzinski sign, kerning sign but in this illness no any patient have sign of meningeal irritation.
- The frequency of seizure in different study of JE varies from 30% to 80% but in this illness frequency of seizure is 100%[6].
- In JE, progress to deep coma occur slowly but in this illness it is very fast (1 to 2 hours).
- The mortality rate of JE is reported to 20 to 50% , but this illness mortality rate is more than 60%[7,8].
- In patients of JE, about 33% to 50% have neurological sequeale after survival of 1 year but this illness there is 10-14% neurological sequelae after survival[9,10,11].
- Duration of illness in JE, is days to weeks but in this illness hours to days.

Laboratory Finding Diffrence :

- The CSF- in JE there is mild pleocytosis (initially polymorph nuclear but in a few days predominantly lymphocyte) and mild elevation of protein with normal glucose but in this illness the CSF picture was Absolutely Normal[11].
- In JE there is normal serum level of Na+ but in this illness about 90% of patient's shows hyponatremia[11].
- In JE there is no change of liver enzyme (SGPT) but in this illness some patient sows increase in SGPT.
- In JE there is normal level of blood urea but in this illness, some patients sows increases in blood urea.
- In this disease there in dramatic response to rapid cooling of body, good response within 4 hours to iv mannitol and easily controllable seizure with one dose of diazepam and phenytoin.

Fig 1 showes the various average temperature and humidity in 2005 and 2011. In the year 2005 there was double epidemic of heat stroke occurs, as there is double rise of temperature, first in 10-20 june and second in 25-29 June.

In 2005 majority (70, 70%) of cases occurred between 12 to 18 June and (30, 30%) between 24 to 28 June. In 2011 majority (22, 73.3%) of cases occurred between 14 to 23 June

Fig 2 shows how this outbreak is related to high temperature and humidity. This figure shows the average temperature,average humidity and number of cases from 2005 to 2011. This clearly indicate the outbreak is 100% associated with high temperature and humidity ie No High Temperature No Outbreak.

Discussion

The above feature of disease suggesting the outbreak is due to heat stroke. The epidemiology and demography clearly suggested that this outbreak is related to high temperature and humidity. The affected children were from low socioeconomic area. They were from village with overcrowding housing condition and poor ventilation. The Muzaffarpur is a zone of high temperature and humidity in May- June(when outbreak occurs).

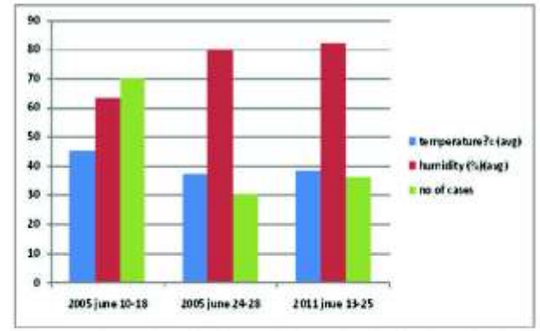

Fig 1 — The no of cases in the graph shows admitted patients in the S K Medical college only. The Actual cases are much more

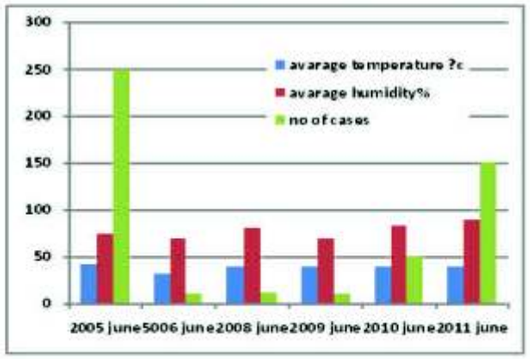

Fig 2 — Weather recorded from-www.undergroundweather.com and number of cases from S K Medical college record room and various news paper of that day

Heat hyperpyrexia was first documented in 24BC by the Romans, but was not demonstrated to result in multi-organ dysfunction until 1946[12]. People of the extreme of age are predisposed to classical heat hyperpyerxia—children due to immature thermoregulatory system, lower rate of sweating and poor acclimatization[13]. Heat wave continues to be a serious problem for the homeless and the very poor in India. The consequence of heat waves have been appalling, both in the West as well the East, both in tropical and temperate regions of the world. In India HS occurs frequently in areas of northern and western India. Over 1000 lives were lost in Andhra Pradesh (AP) when the temperature touches 122°F in 2002 and over 1600 in the whole of the India. Yet the public perception of the hazards of high environmental temperature is often poor and played by public media and even the medical community.

Heat stroke (HS) is life thretning medical emergency – defined clinically as core temperature >40°C accompanied by central nervous system dysfunction[14]. It is an important treatable form of Multiple Organ Dysfunction Syndrome (MODS) resulting from thermo-regulatory failure coupled with a exaggerated acute phase response and possibly altered expression of heat shock protein[15]. Despite the advances in last fifty years, mortality due to HS continues to be as high as 10 to 50 %[16].

There are two form of heat strokes – classical heat stroke occurs during period of high environmental temperature and humidity as in summer heat waves. It usually affects infants or invalid children who are dependent on adults for water and for moving to cooler or shaded surroundings[17]. Classical HS occurs in epidemic form following a rapid rise in environmental temperature. The very young and elderly are particularly susceptible[18,19].

The final report of 2011 outbreak has submitted by Directorate General of Health Services(Emergency Medical Relief) in September with reg no D540/11/-EMR, Nirman Bhavan, New Delhi dated 12th September 2011. They conclude that 'clinico-epidemiological and environmental evidence support the diagnosis of Acute Encephalitis Syndrome which has significient mortality, affecting predominantly rural population with poor sanitation'. However it is unlikely to be Japanese Encephalitis, West Nile, cerebral malaria, NIPAH virus or chandipura virus

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Original Article

Role of doppler ultrasonography in thyrotoxicosis — differentiation between Graves' disease and sub-acute thyroiditis

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Graves' disease (GD) and sub-acute thyroiditis (SAT) are among the commonest causes of thyrotoxicosis. It is prudent to differentiate them because management in terms of subsequent diagnostic evaluation and management is totally disease specific. But it is often difficult to make this distinction without measurement of radioactive iodine uptake (RAIU) which considered as a reference standard. But this facility is not available in most of the smaller cities and towns of India. Color flow doppler ultrasonography which is much more readily available and cheaper allows direct measurement of thyroid function through real-time detection of tissue vascularization and blood flow. In this study 57 patients of thyrotoxicocis after exclusion of toxic nodules were evaluated. Detailed history and physical examination was done with relationship to those pertinent to thyrotoxicosis such as goiter, tachycardia, tremor, eye changes including ophthalmopathy. Thyroid profile was performed. USG including colour Doppler, fine needle aspiration cytology and haemogram were also performed. Tremor, restlessness, palpitation, increased appetite and prominence of eyes were commoner in GD. History of antecedent was present in half of SAT. ESR was much higher in SAT. There was no difference in thyroid profile between them. Increased intrathyroidal blood flow and increased peak systolic velocity (PSV) of inferior thyroid artery (ITA) above 50cm/second has been usually found in hyperthyroidism whereas they are normal or slightly increased in sub-acute thyroisitis.

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Key words **: Graves' disease, sub-acute thyroiditis, radioactive iodine uptake, inferior thyroid artery, peak systolic velocity**

Graves' disease (GD) and destructive thyroiditis are the causes of thyrotoxicosis[1]. It is prudent to differentiate them because management in terms of subsequent diagnostic evaluation and management is totally disease specific[2]. But it is often difficult to make this distinction without measurement of radioactive iodine uptake (RAIU) which is the traditional approach and considered as a reference standard[3,4]. Color flow doppler ultrasonography (CFDUS) is a noninvasive technique that allows direct measurement of thyroid function through real-time detection of tissue vascularization and blood flow[5,6]. Increased intrathyroidal blood flow especially the "thyroid-inferno" pattern and increased peak systolic velocity (PSV) of inferior thyroid artery (ITA) has been usually found in hyperthyroidism whereas they are normal or decreased in the latter[7,8].

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Materials and Methods

Consecutive adult patients attending endocrine clinic within October 2015 to September 2017 with clinical and biochemical features of thyrotoxicosis were included in the study population after obtaining informed consents. Patients with toxic nodule and multi nodular goitre were excluded. Detailed history of the participants were taken emphasizing mostly upon palpitations, tremors, weight loss, increased appetite, eye changes, antecedent fever, sore-throat and other hyperthyroid symptoms. The patients having history of thyroid surgery, radioiodine therapy, previous radiation exposure to neck were excluded from the study. Clinically, the participants were assessed for tachycardia, tremors, goitre, thyroid bruit and the typical symptoms of GD like ophthalmopathy, skin and nail changes etc. Then they were divided into 2 groups: Graves' disease and subacute thyroiditis (SAT), a subtype of destructive thyroiditis, after considering their thyroid function

tests, complete haemogram and fine needle aspiration cytology (FNAC) findings.

Target of our cross- sectional study was to evaluate the role of CFDUS in differentiation of these two diseases hence both the groups underwent thyroid grayscale USG and size and echogenicity of the gland were noted. Normal parameters for gland size were taken as

- 40-60 mm longitudinal diameter
- 13-18 mm AP diameter
- thyroid volume (excluding isthmus, unless its thickness is >3 mm) are 10-15 ml for females and 12-18 ml for males)[9].

CFDUS was performed by a single radiologist using a 5-12 MHz transducer attached Medison Sonoace X8 USG doppler machine and the findings were assessed in 4 grades[1] :

(1) absent intraparenchymal vascularity or minimal spots

(2) presence of parenchymal blood flow with patchy, uneven distribution

(3) mild increase in color flow doppler signal with patchy distribution

(4) markedly increased color flow doppler signal with diffuse homogenous distribution which is also called "thyroid inferno[8]."

Grades 1 and 2 were considered as low or normal vascularity and grades 3 and 4 were considered as a hypervascular thyroid gland. PSV of both left and right ITAs were assessed and their mean flows were calculated and considered as study variables.

The data obtained from the participants were expressed as mean± standard deviation and comparison of means between the groups were done by 't' test. Non parametric data were compared with "Chi-square" test and "Fisher's exact" test. SPSS 21 was used for analysis of collected data. A p value of less than 0.05 was considered as significant. Ethical approval was obtained from the Research Ethics Board of the institute before this study was undertaken.

Results

This study included 57 patients who presented with features of thyrotoxicosis. Out of 21 patients were included in the GD group and the rest 36 were in the SAT group. The mean age of the patients in GD group was 37.86±11.59 years and in SAT group was 36.58±9.711 years (p=0.658) which mostly reflects the thyroid disturbance in young to middle aged people. Female predominance was seen in our study as 45(78.94%) among 57 participants were female. When we compared the symptoms of thyrotoxicosis obtained from history between the two groups it was observed that except sore-throat and antecedent fever most of the symptoms were found to be more frequent in the GD group especially the eye related ones (Table 1). Signs of thyrotoxicosis such as tremor, restlessness and muscle weakness were more frequently found in the patients of GD group (Table 2).

ESR was significantly higher in the SAT group and there were not much difference seen with other parameters like haemoglobin, TLC and thyroid function (Table 3). Prevalence of goiter and hypoechogeneicity of the gland on gray scale sonography did not differ between the groups. There is significant increase in the level of vascularity in the patients of GD group. One of them showed the "thyroid inferno" pattern. Left Inferior Thyroid Artery PSV was significantly higher in the GD group with a mean value of around 56 cm/sec compared to a mean of around 26cm/sec in SAT (Table 4).

Table 1 — *Showing comparison of thyrotoxic symptoms among two groups*

Symptoms	Graves' Disease	Subacute Thyroiditis	p-value
Sore- throat	4 (19.0%)	12 (33.3%)	0.247
Antecedent fever	3 (14.3%)	18 (50.0%)	0.007
Tremor	18 (85.7%)	14 (38.9%)	0.001
Palpitation	17 (81.0%)	19 (52.8%)	0.033
Weight loss	15 (71.4%)	17 (47.5%)	0.123
Heat intolerance	8 (38.1%)	10 (27.8%)	0.419
Hyper defaecation	3 (14.3%)	6 (16.7%)	0.564*
Increased appetite	8 (38.1%)	3 (8.3%)	0.012*
Neck swelling	11 (52.4%)	15 (41.7%)	0.433
Foreign body sensation	3 (14.3%)	1 (2.8%)	0.136*
Double vision	2 (9.5%)	0 (0.0%)	0.132*
Prominace of eyes	3 (14.3%)	0 (0.0%)	0.045*
Diminished vision	1 (4.8%)	3 (8.3%)	0.529*
Family History	2 (9.5%)	4 (11.1%)	0.613*

*Analysis done using Chi-square and *Fisher's exact test*

Table 2 — *Showing the comparison of thyrotoxic signs between two groups*

Signs	Graves' Disease	Sub acute Thyroiditis	p-value
Tremors	17 (81.0%)	14 (38.9%)	0.002
Restlessness	12 (57.1%)	4 (11.1%)	0.000
Muscle weakness	7 (33.3%)	0 (0.0%)	0.000*
Goitre	13 (61.9%)	16 (44.4%)	0.203
Onycholysis	3 (14.3%)	1(2.8%)	0.136*
Ophthalmopathy	2 (9.5%)	0 (0.0%)	0.132*

*Analysis done using Chi-square and *Fisher's exact test*

Table 3 — *Comparison of the haematological investigations between two groups*

Blood Tests	Graves' Disease (mean±SD) n=21	Subacute Thyroiditis (mean±SD) n=36	p-value
Haemoglobin (gm/dL)	12.48±1.537	12.68±1.414	0.607
TLC	6828.57±1816.079	7711.94±2829.153	0.205
ESR (mm/1st hour)	21.05±27.198	50.53±20.031	0.000
TSH (mIU/L)	0.1126±0.30349	0.0406±0.07087	0.176
T3 (nmol/L)	7.00±2.911	6.09±3.752	0.346
T4 (nmol/L)	278.14±64.673	261.86±77.172	0.419

TLC – total leucocyte count ; ESR – erythrocyte sedimentation count
TSH – thyroid stimulating hormone ; Analysis done using student 't' test

Table 4 — *Showing comparison of ultrasound findings between the two groups*

Ultrasound Findings	Graves' Disease	Sub-acute Thyroiditis	p-value
Enlargement	16 (76.2%)	19 (56.8%)	0.080
Hypoechogenicity	18 (85.7%)	34 (94.4%)	0.346*
Increased vascularity	16 (76.2%)	9 (25.0%)	0.000
Right ITA PSV (mean±SD) (cm/sec)	45.67±22.223	25.77±32.716	0.197
Left ITA PSV (mean±SD) (cm/sec)	56.17±21.575	25.77±23.474	0.016

ITA – inferior thyroid artery ; PSV- peak systolic velocity
Analysis done using students 't'test and Chi-square test

Discussion

Thyrotoxicosis with diffuse thyroid disease is either caused by hyperfunction of thyroid gland such as GD or destructive like silent thyroiditis, SAT, and postpartum thyroiditis. Differentiation of these two types of thyrotoxicosis is very important as patients with GD must be treated with antithyroid drugs, radioiodine therapy or subtotal thyroidectomy, while patients with destructive thyrotoxicosis are treated with conservative therapy[1,3].

Among the causes of spontaneous thyrotoxicosis, GD is the commonest[2]. Typical cases of GD, ie, those with ophthalmopathy and skin and nail changes are not very difficult to diagnose. But differentiation of destructive thyroiditis and early GD is very challenging. Radio active iodine uptake (RAIU) has been considered as the traditional diagnostic approach in common practice for differentiation of GD related and non Graves' disease related thyrotoxicosis but limited availability in our parts of our country and contraindication in pregnancy, lactation makes the diagnosis real difficult sometimes[3].

Our study included 57 patients, 21 with Graves' disease and 36 with subacute thyroiditis among whom we can clearly see a female predominace. Almost 80% of our participants were female which is similar with the study conducted by Harikumar *et al*[1]. And the female predominance is even more in the SAT group. Similar findings were also seen in the study of Harikumar *et al*[1] where the percentage of female patients in GD and thyroiditis groups were 70.58% and 87.10% respectively.

History of sore throat and antecedent fever is more in the SAT group which suggests an eminent role of a recent viral infection as an etiological factor in SAT as suggested by Volpe *et al*[10]. Thyrotoxic symptoms like tremors and palpitations were significantly higher in GD group. Almost half of the patients in each group have complained about having neck swelling but symptoms related to eyes were more frequent with patients in GD group.

Patients with GD had significantly higher pulse rate than those with SAT though tachycardia is present is present in SAT also. Similarly tremor was also found to be present more frequently in GD group. Other findings like restlessness, muscle weakness were also significantly higher in GD. Ophthalmopathy was present only in GD patients. Though goitre was seem to be more prevalent in GD group but it was statistically insignificant. Thyroid profile showed no difference between the group.

Among the haematological parameters, ESR was significantly higher in the SAT group which support the presence of an acute inflammatory process behind the thyrotoxicosis in SAT.

Gray-scale ultrasonography (USG) is the basic modality in the examination of thyroid gland. Echogenicity of the thyroid is a qualitative ultrasound variable that has been evaluated as an index of the relapsing or remitting course of the disease[11]. It usually shows an enlarged gland with a pronounced hypoechoic pattern in patients with GD. This hypoechoic pattern is the reflection of infiltration by lymphocytes and follicular degeneration of the gland which is a better marker than thyroid antibodies for predicting thyroid dysfunction[12].

On grayscale ultrasonography, thyroid gland was found to be enlarged in more than half of the participants and among them the frequency was higher in the patients with GD. In the GD group, 76.2% of participants had an enlarged thyroid.

Echogenicity of thyroid in gray scale ultrasonography hypoechogenicity was seen more in the participants of SAT group. Alzahrani *et al*[2] have found out in their study that most of the cases of Graves' disease showed hypoechogenicity though it was not specific for the disease but more specific for thyroiditis especially Hashimoto's thyroiditis.

Doppler ultrasonography is a powerful imaging technique which not only identifies a substantial proportion of patients with GD but also can be used to assess the disease activity and predicts the outcome after withdrawal of medical therapy[13]. The advantage of CFDUS is that it allows visualization of the blood flow in the examined tissue and thus provides a very important tool for the diagnosis of GD which is characterized by a marked, diffuse increase in intrathyroidal blood flow as observed by Sponza *et al*[14], Kumar KV *et al*[15], Bogazzi *et al*[16] and Aldasouqi *et al*[17] CFDUS showed a significantly increased level of vascularity in patients with GD. During the assessment of thyroid function we saw that the TSH and T4 level higher in the SAT group which was not expected. Inspite of this contrasting result, GD group has shown significantly increased vascularity which perfectly matches with the findings of Bogazzi *et al*[18], Arslan *et al*[19] and Baldini *et al*[20] who have shown that there was no relationship of vascularity and severity of disease and the hypervascularism was not related to the circulating thyroid hormone levels but probably related to the activity of underlying autoimmune process.

In that context, another study worth a mention is the one conducted by Kurita *et al*[21]. They measured the Thyroid Blood Flow Area which was a quantitative measurement of area showing thyroid blood flow calculated as a percentage of total thyroid area and they have established it as a moderately effective method to distinguish between GD and thyroiditis. In their study, 95% of GD patients had TBFA of 8% which was sufficient to distinguish it from destructive thyroiditis.

Hiromatsu *et al*[6] have shown hypoechoic swollen thyroid without increased tissue vascularity as a feature of subacute thyroiditis. But he also mentioned about findings of slightly increased vascularity in the patients with SAT in recovery stage which was well correlated with thyroid hormone levels and normalized within 1 year of follow up.

Peak systolic velocity of left inferior thyroid arteries was significantly higher in patients of GD group. In 1999, Caruso *et al*[22] performed doppler ultrasound of thyroid and measured the inferior thyroid artery PSV in 8 patients of GD and 23 patients of throiditis for 8 months and showed that the mean PSV of ITA was always more than 150cm/s in GD patients and never more than 65cm/s in thyroiditis patients. In 2013, Banaka *et al*[23] showed that the specificity of left ITA PSV was 91.7% and established a reference range of 26.11cm/s. The Youden index of left ITA PSV (0.697) was much higher than right ITA PSV in his study. Vitti *et al*[24] studied the thyroid blood flow by CFDUS and PSV in ITA in 37 GD and 45 goitrous Hashimoto's thyroiditis patients and observed similar results.

Harikumar *et al*[1] found an ITA PSV of 57.6±13.1 cm/s (p=0.05) in GD which is comparable with our study. Their ITA PSV of 22.4±5.6 was also similar to our findings. Erdogan *et al*[15] conducted a study with 29 patients of Graves' Disease, 26 Toxic Adenoma patients, 24 Hashimoto's Thyroiditis patients and 39 euthyroid patients as control in which they found higher intrathyroidal vascularity in Graves' Disease.

There are some limitations of the present study which include small sample size, no assay for Anti-thyroperoxidase antibodies (Anti-TPOAb) which are present in around 80% cases of GD[25] so its absence does not exclude GD. And it can be present in around 10% of normal individuals. Finally, Radio-iodine uptake was not done as this facility is not available in our state.

Conclusion

In centers with no facility for Radio-iodine uptake test, doppler ultrasonography assessing the peak systolic velocity of inferior thyroid artery can be used as an alernative method to differentiate GD from SAT where history, physical examination and other laboratory investigation may not give a definitive clue.

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Original Article

Is anaesthesia a poorly recognised medical speciality

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Anaesthesiology today is an upcoming multimodality specialty in medical science with its spectrum ranging from perioperative patient care to pain management, critical care and palliative care. We talk of newer drugs, equipments, advances in postoperative care and critical care but we tend to ignore that is the general population aware of all this. Are the people aware of the role of anaesthetist as a doctor? The present study was undertaken to assess patients' knowledge of anaesthesia and perioperative care as well as their perception of anaesthetics and their role. After taking permission from hospital authorities, a questionnaire consisting of 12 questions was prepared by a team of qualified anaesthetists. 200 preoperative patients, aged 25-65 years were included in the study. The patients were questioned both preoperatively and 48 hours postoperatively. The questions aimed at assessing perceptions and knowledge of patient of anaesthesia, the role of anaesthetists and surgeons in patient care. Upon asking about the role of the anaesthesiologists in the operation theatre most of the people answered that the anaesthesiologists administers drug once and goes away. The results of this audit show a poor perception of the anaesthetists role both inside and outside the operating room. The patients remember more about their surgeons than their anaesthetist. We found that majority of the people knew the anaesthesiologist as a skilled assistant to surgeon. Thus we conclude that ignorance regarding the anaesthesiologists and anaesthesiology is still prevalent among the general population. Increased efforts are required to inform patients about the roles of anaesthetists in their care. Preoperative instruction has been demonstrated to have benefit with regard to patient anxiety, postoperative pain, and length of hospitalization. Preoperative teaching should therefore be tailored accordingly.

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Key words **: Perception of Anaesthesia, Pre-operative communication.**

Anaesthesia was first introduced in the year 1846. Since that time much advancement has taken place in this field. From homologous skin transplant to heart transplant, anaesthesia and anaesthesiologist has a major role to play. Anaesthesiology today is an upcoming multimodality specialty in medical science with its spectrum ranging from perioperative patient care to pain management, critical care and palliative care. We talk of newer drugs, equipments, advances in postoperative care and critical care but we tend to ignore that is the general population aware of all this. Does the common man know what anaesthesia is? Are the people aware of the role of anaesthestist as a doctor? The problems of image and status of the anaesthesiologists in the eyes of the medical and lay communities are not new[1]. Patients' knowledge of anaesthetists' qualifications and roles remains inaccurate despite the efforts of professional bodies worldwide. Most people are under the misconception that anesthesiologists are not physicians and the role of the anesthesiologist, both in and out of the operating room, is not fully understood. Many surgical patients, particularly younger ones, have fears about the anesthetic that are distinct from their fears about the surgery, the most common of them relating to waking up prematurely or not at all. Preoperative instruction has been demonstrated to have benefit with regard to patient anxiety, postoperative pain, and length of hospitalization. Due to lack of proper communication with the patients, they learn little about anaesthesia and anaesthesiologist. The present study was undertaken to assess patients' knowledge of anaesthesia and perioperative care as well as their perception of anaesthetics and their role.

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Materials and Methods

The study aimed to know the basic perception of patients about anaesthesiology and the anaesthetist. The study was conducted in a tertiary care cancer centre. After taking permission from hospital authorities, a questionnaire consisting of 12 questions was prepared by a team of qualified anaesthetists. 200 preoperative patients, aged 25-65 years were included in the study. Patients who refused to participate or were unable to participate in a consenting process (unconscious or critically ill patients) were excluded. The

questionnaire was drafted in English and was self-administered by patients sufficiently proficient in English. For non-English speaking patients the questionnaire was administered in their vernacular language by a trained interviewer proficient in that language. Included in the study were 120 women and 80 men. The patients were questioned both preoperatively and 48 hours postoperatively. The questionnaire consisted of a general, part with questions on demography for all participants, and other sections containing multiple choice questions with options covering discrete facts and sometimes requiring a "Yes", "No" or "Don't know" response. The questions aimed at assessing perceptions and knowledge of patient of anaesthesia, the role of anaesthetists and surgeons in patient care, recall of who the anaesthetist or surgeon was in patients who had previous experience of anaesthesia and surgery and their experience of anaesthetic exposure, qualifications and role of anaesthetists in patients who had no previous experience of anaesthesia and had not undergone any surgery in the past, the knowledge of the proposed surgical procedure, apprehensions about surgery, technique and choice of anaesthesia (regional or general) to be used, possible complications of anaesthesia, as well as the desire to meet the anaesthetist and to receive more information on anaesthesia. 48 hours after operation, the patients were asked about their experience of the present anaesthetic exposure and awareness under anaesthesia, opinion regarding pre-operative and post-operative visit of anaesthesiologist and expectation from anaesthesiologist, the message they would like to convey to their friends and society about anaesthesia and anaesthesiologist.

Results

A total of 200 patients were included in the study out of which 120 were females and 80 were males. Out of 200 patients 131 were Hindus, 67 were Muslims and 2 patients were Christians. 60 (30%) patients were illiterate, 72 (36%) patients had received education up to 10th standard and 68 (34%) patients were educated at least up to 12th standard (Table 1). We noted that gender and religion did not influence patients' knowledge of the role of anaesthetists. 50 patients ie, 25% of the patients had previous exposure to anaesthesia. Out of rest of 150 patients, 78 patients (39%) considered anaesthesia to be a special branch and 72 patients (36%) said they had no idea about Anaesthesia. 148 (74%) patients considered anaesthetists to be doctors, 30 (15%) patients thought that they were nurses and 22 (11%) patients had no idea about designation of anaesthetists. 144 patients (72%) were worried when they first came to know about surgery, 38 patients (19%) said that they would accept Gods decision and 18 (9%) patients said that they were not bothered about the outcome. 86 (43%) of the patients were worried only about surgery,

Table 1 — *Demographics of the Patient*

Sex	120 Females, 80 Males
Religion	131 Hindus, 67 Muslims, 2 Christians
Education Level	60 Illiterate, 72 Class 10, 68 Higher secondary and above

58 (29%) of the patients were worried about anaesthesia, 40 (20%) were worried about both anaesthesia and surgery and 16 (8%) patients were not worried as they had left everything on God (Table 2). Of the 200 patients who completed the questionnaire survey, 50 (25%) had been anaesthetised previously. Of these, 36 patients, 18% preferred regional anaesthesia (RA), 7% wanted general anaesthesia (GA). 44 patients had pleasant experience of anaesthesia, 2 patients complained of intraoperative awareness, 3 complained of backache and 1 patient complained of Post Dural Puncture Headache (PDPH). Out of 150 patients (75%) who had no previous anaesthetic exposure, 98 patients (49%) preferred GA, 40 patients preferred RA and 12 patients had no choice (Table 3). All these 200 patients who underwent surgery were also assessed postoperatively. When asked about intraoperative experience, 159 patients (79.5%) had good experience and 41 (20.5%) patients had no reaction. In 159 patients said that they would like to interact with anaesthetists before and after the surgery in case they were operated upon in future, 25 said they would not like to interact and 16 had no choice (Table 4).

Table 2 — *Perception about Anaesthesia*

Considered anaesthesia a special branch	78 Yes	72 No Idea	50 had previous anaesthetic exposure (44 had pleasant experience)
Anaesthesiolgists are Doctors	148 Yes	30 Nurses	22 No Idea
1st Impression when came to know of surgery	144 Worried	38 Will accept gods decision	18 not bothered at all
More apprehensive about Anaesthesia or Surgery	86 for Surgery only	58 for Anaesthesia only	40 bothered for Both, 16 dependent on God

Table 3 — *Choice of Anaesthesia*

Patients who had no previous exposure to anaesthesia	98 general anaesthesia, 40 regional anaesthesia	12 no choice
Patients who had previous exposure to anaesthesia	36 regional anaesthesia	14 general anaesthesia
Previous experiencet	44 had pleasant experience	2-Awareness, 1- PDPH, 3-Backache

PDPH - Post Dural Puncture Headache

Table 4 — *Postoperative Analysis*

Intraoperative experience Whether they would like	159 had good experience	41 had no reaction
to interact with anaesthetist before and after ot if they came for surgery next time	159 would like to interact, 25 would not like to interact	16 had no choice

Discussion

The results of this audit show a poor perception of the anaesthetists role both inside and outside the operating room. The present study was undertaken to assess patients' knowledge, attitudes, and concerns regarding anesthetic management. Out of 200 patients, 50 had previous exposure to anaesthesia, so they had knowledge about anaesthesia. Out of the remaining 150, only 78 patients considered anaesthesia to be a special branch. A total of 148 patients considered anaesthetists to be doctors. Upon asking about the role of the anaesthesiologists in the operation theatre most of the people answered that the anaesthesiologists administers drug once and goes away. This was in contrast to the findings of the surveys conducted in developed countries where a majority of patients felt that the anaesthesiologist stays during operation to look after their vitals[2-5]. Role of the anaesthesiologists after induction was not clear to many patients in previous studies[6-7]. 43% of the patients were worried only about surgery, 20% were worried about both anaesthesia and surgery and 29% were worried only about anaesthesia. We found that majority of the people knew the anaesthesiologist as a skilled assistant to surgeon. The reason for this poor knowledge of anaesthesia among patients may be connected to the fact that anaesthetists are often busy in the operating theatre with few and limited opportunities to interact with their patients. As on today, much of the emphasis in anaesthesiology is on intra-operative patient monitoring to improve patients' safety. But in our study majority of the population was unaware of intra-operative patient's monitoring. Most of the people knew about the techniques of regional anaesthesia with majority answering local anaesthesia as a type of regional anaesthesia. Now a days, the advancements in regional anaesthesia have allowed many complex surgical procedures to be performed under regional anaesthesia. But in our study no one knew about advantages of regional anaesthesia on other types of anaesthesia. Out of 150 patients who had no previous anaesthetic exposure, only 40 patients preferred RA. Most of the patients who did not opt for RA had the misconception that with RA they would have postoperative backache which would continue for many years to come. For most of the patients what RA meant was either Local Anaesthesia (LA) or Sub Arachnoid Block (SAB). When asked about their experience of previous anaesthetic exposure, 44 patients had pleasant experience, 2 patients complained of awareness under anaesthesia, 3 patients complained of backache and 1 patient complained of Post Dural Puncture Headache (PDPH). Educating the physicians or surgeons regarding our discipline may improve the knowledge that the patients get from them regarding our role in patient management. The patients remember more about their surgeons than their anaesthetis[8,9] it may be because of the limited time we spend in communicating with patients resulting in not obtaining adequate patient satisfaction as compared to other specialists. Patients' knowledge of anaesthetists' qualifications and roles remains inaccurate despite the efforts of professional bodies worldwide. Increased efforts are required to inform patients about the roles of anaesthetists in their care. Preoperative instruction has been demonstrated to have benefit with regard to patient anxiety, postoperative pain, and length of hospitalization. It is also clear that patients' coping behavior varies considerably and strongly influences the usefulness of providing detailed preoperative information. Preoperative teaching should therefore be tailored accordingly. Advances in surgical diagnosis and treatment and critical care have depended upon the development of anesthesia as a specialty. The evaluation of educational methods for disseminating information about anesthesia thus may be important in determining the very future of our specialty and the quality of surgical and pain therapy that patients will receive. From the authors' experience, i.e. at our hospital, most patients scheduled for elective surgery do not know what to expect and often have limited knowledge of anaesthesia. Providing reliable information to patients may help to reduce patient anxiety and improve perioperative care. This survey revealed poor patient knowledge of anaesthesia, qualifications and the role of anaesthetists in the management of surgical patients. The role of anaesthetists in resuscitation, intensive care and acute and chronic pain management remains undetermined, and further studies are required to evaluate patients' knowledge in this regard. Providing sufficient information may help dispel the myths and misconceptions surrounding anaesthesia and surgery in our country.

Conclusion

Thus we conclude that ignorance regarding the anaesthesiologists and anaesthesiology is still prevalent among the general population. A few patients recognise their leading role in the care of patients during surgery or their other roles outside the operating theatre. Increased efforts are required to inform patients about the roles of anaesthetists in their care. It is important that patients realise that they are being cared for by anaesthetists who are doctors and efforts must be taken to educate the pro-

fession and public on the anaesthetists' role in perioperative care. Preoperative instruction has been demonstrated to have benefit with regard to patient anxiety, postoperative pain, and length of hospitalization. Preoperative teaching should therefore be tailored accordingly.

Conflicts of interest : Nil.

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Original Article

Awareness of Cancer Cervix and its prevention with HPV vaccine in internees, final MBBS students, Nursing staff and paramedical staff in a teaching institute

Vuba Rama Rao[1], Pandula Revathi[2], V Karuna[3], Josna Jose[4]

Aim of the study to collect information about the specific knowledge and awareness of CaCx and its seriousness & benefits of vaccination and screening. Konaseema Institute of Medical Sciences & Research Foundation (KIMS), Amalapuram, Andhra Pradesh, India. In developing countries CaCx is the most common cause for morbidity and mortality in women among the gynaecological cancers. So, it is essential all the medical professional should have awareness regarding carcinoma cervix and its prevention with HPV vaccination. Hence, the study is conducted in medical professionals of KIMS which is a rural medical college. A total no of 350 were interviewed with a structured questionnaire in a cross sectional study. The group consists of internees, final MBBS students, Nurses and Paramedical staff working in KIMS. The survey has been conducted in the months of June, July, August, 2011. Out of 350 interviewed In cross sectional survey – 96.8% of respondents are aware of CaCx is a most common malignant disease in females. Only 3.1% are not aware of the disease. In 73% of respondents know the cause of CaCx, 75% know that HPV is the cause, 74.8% of respondents stated that primary prevention is possible with HPV vaccine, 81% aware secondary prevention is possible with Pap Smear. But only 0.57% have taken vaccination and only 6.5% have taken Pap Smear (only married people taken for study). This study shows the internees, students have sound knowledge about the CaCx and its prevention with Vaccination. But Nurses, Paramedical staff did not have adequate knowledge about the disease and its prevention. So they need proper health education regarding the disease.

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Key words **: Cancer cervix, HPV Vaccination and pap smear.**

In Asian countries like India the cervical cancer is the most common cancer, highest killer disease and top killer of genital cancer. In the year 2008 WHO has published that 5,29,409 new cases reported all over the world, and 2,74,883 deaths occurred annually. In India annually 1,34,420 New cases, 79,000 deaths got reported with an incidence of 23.5 / 100,000. India harbours a majority of cervical cancer cases in world wide incidence. Most of the cases reported at the advanced stage due to lack of awareness, health education and screening in rural area. WHO recognized the importance cervical cancer and recognized it as a global health problem due to its rising alarming situation of newly diagnosed cases. So to prevent CaCx, primary prevention to be done by HPV vaccination. Secondary prevention by screening by Pap smear. So WHO recommending routine HPV vaccination before the onset of sexual activity for prevention of HPV related diseases. In this process not only doctors but paramedical , personnel, other health workers should have knowledge about vaccination, to be involved in health education and promotion of vaccination. So Central Government, State Government and various non Government. organizations should come forward to organize massive community education, campaign to vulnerable population of society. HPV vaccine programs among adolescents and young women may result rapid reduction of cervical cytological abnormality there by cervical cancer. Countries like USA / UK, Australia taking up as National program of vaccination against high risk HPV 11, 16, 18, 68. Secondary prevention of CaCx is possible by screening by Pap Smear. Screening is search for disease in whom, who do not seek health care. Detection of precancer or micro invasive stage is possible, cure is 100%. Selective screening is most appropriate approach. In 1984 National cancer control programme (NCCP) came up and launched screening programme in India and it is modified in 2006. The protocol not appropriate to take care of all women from risk of CaCx. No organized screening programme is available till today, due

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to high cost, inadequate infrastructure, trained personnel. Pap smear is available for limited number of women in India.

Materials and Methods

A cross study is made in a total number of 350 were interviewed with a structured questionnaire. It includes registered internees, final year MBBS students, registered nurses and paramedical staff from Konaseema Institute of Medical Sciences, Amalapuram, AP, India. Total no. of males 112 with mean age 26.8. Total no of females 238 with mean age 26.7.

It consists – 120 medical students, 85 internees, 62 GNM, 43 ANM, Bsc Nursing 13, 1 Msc Nursing , Lab technician 26 (Table 1).

Table 1 — *Demographic Characteristics*

Total number	N – 350	Cadre	
Mean± SD	26.8 years	Internees	24.28% (N – 85)
20 - 30 years	88% (N – 308)	Medical students	34.5% (N – 120)
30 – 40 years	7.7% (N – 27)	GNM	17.7 (N – 62)
>40 years	4.3% (N – 15)	ANM	12.28% (N – 43)
		Bsc Nursing	4% (N – 14)
		Lab technicians	7.42% (N – 26)

Results and Observations

Awareness of epidemiology of cervical cancer : In our study Most of the respondents 96.8% aware the CaCx is a most common malignancy and 73% know the cause, 75% know HPV is the cause, 85% were saying death will occur once they get the disease (Table 2).

Table 2 — *Awareness of epidemiology of cervical cancer*

	Percentage (%)
CaCx is disease	339 (96.8%)
Cause for CaCx	256 (73%)
HPV is the cause	263 (75%)

Awareness of Aetiology: In our survey 75% aware HPV is the causative organism and 80% aware genetic factor is responsible. 26.8% say don't know the cause (Table 3).

Awareness about risk factors : In our survey Several risk factors have been mentioned. 80% were a opinion genetic and family H/o is a risk factor. 79% of opinion multiparity, multiple sex partners, Early marriage and coitus. Other risk factors - low economic status and poor hygiene 72%. advanced age 79.4%, venereal warts 75% and 60% are of opinion – circumcision will prevent , unprotected coitus 67.4%, smoking 58%.

Table 3 — *Risk factors & Percentage (%)*

Genetic, family H/o	80% (N=280)
STD	76% (N=265)
Multiparity, multiple sex partners	79% (N=278)
Unprotected coitus	67.4% (N=236)
Early marriage coitus	69.1% (N=242)
Smoking	58% (N=203)
Low social status, poor hygiene	72% (N=252)

Awareness about treatment of CaCx : In our survey 87.4% aware that treatment is present for CaCx, Majority of sample 92.8% says treatment depends upon staging. About modality of treatment : 93.7% - Radiotherapy, 92% - Chemotherapy, 90.8% - Surgery (Table 4).

Table 4 — *Awareness about treatment & Percentage (%)*

Treatment depends upon staging	92.8% (N = 325)
Chemotherapy	92% (N = 322)
Radiotherapy	93.7% (N =328)
Surgery	90.8% (N = 318)

Awareness about primary prevention with HPV vaccine : In our survey 74.8% respondents aware that primary prevention is possible with HPV Vaccine. 77% aware that HPV vaccine is available in the country, 51.4% Knew about no of doses of vaccine to be given, 48.5% Say side effects present. But regarding taking up vaccination a least number has taken ie, only 0.5%. Of their family members only 1.1% have taken vaccine. In our study38.4%are respondents had counseling for vaccination before. Counseling had been given while interviewing them.

Awareness about Pap smear in Secondary prevention : In our survey 81% aware secondary prevention is possible with screening by Pap smear, 46.8% aware what age screening to be started , 38% aware what age screening to be ended, 20% had counseling for screening but 6.5% have taken Pap smear (only married people included), Counseling had been given while interviewing them (Table 5).

Table 5 — *Awareness about HPV Vaccination & Pap Smear*

	Percentage (%)
HPV Vaccination :	
Primary prevention with HPV Vaccine	74.8% (N=262)
No of doses of vaccine	51.4% (N=180)
Side effects	48.5% (N=170)
Vaccination taken	0.5%(N=2)
Family member have taken vaccine	1.1% (N=4)
Counseling for vaccination .	34.8% (N=122)
Pap smear :	
Pap smear for Secondary prevention	81% (N=284)
What age to be started	46.8% (N=164)
What age to be ended	38% (N=133)
Counseling for screening	20% (N=70)
Pap smear taken	6.5% (N=3)

Awareness about the symptoms of CaCx : In our survey 88%of respondents aware irregular bleeding P/V and post coital bleeding are the symptoms, 85% say foul smelling discharge, 73.4% Says they will have lower abdominal pain. 42.5% Loss of Wt and appetite (Table 6).

Table 6 — *Awareness about symptoms*

	Percentage (%)
Irregular bleeding P/V and post coital bleeding	88% (N=308)
Fouls smelling discharge	85% (N=298)
Lower abdominal pain	73.4% (N=257)
Loss of Wt. and appetite	42.5% (N=150)

Discussions

In our survey most of the participants expressed their opinion that in developing countries the CaCx is most common genital cancer causing morbidity and mortality. 75% of respondents expressed that HPV is the cause for the disease. Another 75% of opinion that STD are responsible. Our study correlates with the study of Sayed Faizen Ali, Samia Ayub of opinion 78% say that HPV is cause, and 89% say STD is resiponsible[1]. Long term infection and high risk strains (11,16,18,31,33,35) leads to cervical dysplasia[2]. High risk strain contains double stranded DNA genome which functions as oncogene called as E_6 and E_7[3]. In our survey 75% of respondents were of opinion that sexually transmitted diseases are responsible. 79% of opinion HIV infection associated with CaCx . Weakened immune system cause five fold risk of getting persisting HPV[4]. The most common STD Chlamydia trichomatis, when it is chronic & associated with HPV. it will make HPV more persistent[5].

Regarding awareness : In our survey >90% respondents aware and heard about the disease and 85.4% of opinion that it is serious disease causing death since most of the people seeking medical advice at advanced stage. 79% of respondents say the average age to get disease is >50 years. American cancer society says most of the cases diagnosed between 35 and 45 years[6]. Several studies were done regarding awareness, a study by OA Ayinde, AO Migbodu *et al*, in medical students stated that 96% aware of CaCx[7]. Similar study among medical workers. by Mutaba T, M miro FO *et al*, - shows 93% aware of CaCx[8].

Risk factors : In our survey several risk factors were mentioned and respondents expressed their opinion. 80% of opinion genetic & family H/o is a risk factors, 58% of opinion smoking, 72% of opinion low socio-economic factors, 70-75% of opinion multiple sex partners and early marriage and sex, 67% were of opinion unprotected coitus is a risk. Mother and sister have cancer, two fold risk of developing CaCx, suggesting inherited susceptibility[9]. Cigarette smoke has carcinogens, will cause mutation in DNA, increase risk of squamous cell cancer, not adenocarcinoma[10]. Low socio-economic status increase CaCx due to lack of education, hygiene, screening, prevention of HPV, lack of treatment of pre cancerous lesions[2]. A similar study by O Awodele, AAA Adeyonoye *et al*, where risk factors – multiple sex partners 54%, early marriage and sex 47.5%[11]. In our survey respondents expressed unprotected coitus (67%) is risk factors. Use of condom reduces the chance of HPV and other STD, there by reduce risk of CaCx. 100% male partners condom use – 70% less likely to get infection[12].

Circumcision : In our survey 59% of respondents of opinion male circumcision will prevent the disease, there by reduces HPV, HIV in men there by reduce HPV, HIV in female so decrease incidence of CaCx[13].

Symptoms : In our study many participants stated that common symptoms are Irregular and post coital bleeding (88%), Foul smelling discharge (85%), lower abdominal pain (73.4%) loss of wt. and appetite (42.5%). Regarding treatment in our study most of the respondents 87.4% knew that there is treatment for CaCx majority of opinion 92% say modality of treatments depends upon the stage – either radiotherapy 93.7% or surgery 90.6% or chemotherapy 92%.

Prevention : Prevention of Ca Cx is possible with three approaches i:e health education / primary prevention with HPV vaccine / secondary prevention with screening and treatment. Interactive cervical cancer education to improve cancer awareness and HPV vaccination through lectures, cancer posters to reduce the incidence. Ca Cx is preventable with HPV Vaccine. In our survey 75% respondents aware that Primary prevention is possible with vaccination. The development of vaccine against HPV is a major step in the fight against cervical cancer. 51.4% knew about no. of doses (3 doses). 48.5% make a comment that it has side effects. Only least number has taken vaccination i:e 0.5%. Only 1.1% of their family members have taken. 34.8% had counseling for vaccination. Side effects – allergic reaction, pain at the site[14]. A similar study by Hopkin TG, Wood NJ *et al* in health professionals shows 90% aware of Vaccine, they recommended vaccine even at 11 – 13 years[15]. another study by Choi KA, Kimj H *et al* in Korea 78.3% aware of HPV vaccine and recommended[16]. in our survey 48.5% respondents say some side effects present. As per CDC updates the side effects Negligible only 0.058%[17]. in our survey only 34.8% had counseling, but only 0.5% had vaccination. It shows majority did not have counseling as well as vaccination because of cost effect of vaccine and which is unaffordable by many of them. As per WHO – HPV prevalence rate in India 8% even at the age of 18-25 years. Since HPV infection is seen in young women in early twenties, hence vaccination is adolescents and young adults is the best policy, and should be made compulsory. Yong adolescents and adults have to be integrated for counseling for HPV vaccination. In this meeting parents and husbands have to be attended[18].

Doses of vaccination : In our survey 51.4% are aware of 3 doses of vaccine to be taken. A study by National Cancer Institutes costa Rica Vaccine trail recommending now, only two doses of vaccine, which is as effective as three doses[19]. At present developed countries has got in-

tention to eliminate CaCx with screening by compulsory vaccine[20]. Two vaccine available both are FDA approved Oct.2009 to be given at 9–26 years. Gardasil against 6, 11,16, 18, cervarix 16, 18[21,22].

Secondary prevention : Is possible with screening with Pap smear. In or survey 81% respondents aware of secondary prevention by pap smear, 46.8% aware of at what age pap smear to be started. 38% aware at what age pap to be ended. Only 20% had counseling for pap smear, but 6.5% had taken pap. A similar study by Mutyaba T, M Miro F A *et al* among doctors, Nurses, students that 93% aware of CaCx, 83% aware of pap smear 81% never had screening and 19% had screening[8]. Another study by Kabir M, Iliayasu Z et al, where they found 94.7% had positive attitude towards pap smear[23] but only 20% had pap smear[24]. Another study by M Urasa, E Darj *et al* from TanZania where 0.8% had pap smear. Above studies shows majority (90%) had positive attitude and good awareness for pap smear, still they are not going for it. We found only 0.8 to 20% taking pap. This shows they need to have health education and motivation to utilize this service. No organize screening programme are available due to high cost in adequate infrastructure and trained persons.

Conclusions

This study shows the internees, students have sound knowledge about CaCx and its prevention with HPV vaccine . but Nurses, Para medical staff did not have adequate knowledge about the disease and it prevention. Good number of respondents aware of the disease and vaccination but when its comes to the uptake very less have taken pap smear and vaccination. To prevent CaCx, preventive measures should be taken either by Govt. or NGO's in the form of creating awareness in the public and immunization with HPV vaccine either free cost or at a subsidized rate and to be included in National immunization schedule and to be made compulsory. So that the disease will be eradicated from the society for future generations.

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Case Report

Epidermoid cyst of the spleen — a case report

Tanvi Rao[1], Shubhakar Bhandary[2], Lancelot Lobo[3]

Splenic cysts are rare entities. Epidermoid cysts of the spleen constitute 10% of total splenic cysts. These cysts are more common in children and young adults. We report a case of 21 year-old female who presented with left sided dull aching, intermittent abdominal pain and a palpable mass in the left hypochondrium. USG abdomen showed gross splenomegaly with a large cystic lesion in the spleen. CT scan revealed a grossly enlarged spleen with a cystic lesion suggestive of a splenic cyst and mild hepatomegaly. USG guided aspiration of the cyst and pigtail catheter insertion was done. Cystic fluid analysis was suggestive of epidermoid cyst of the spleen. Laparoscopic total splenectomy was done and histopathological evaluation revealed fibrosed cyst wall with stratified squamous lining confirming the diagnosis of epidermoid cyst of spleen. This case report favours total splenectomy based on the size of the cyst for a better post-operative outcome. A definitive diagnosis of epidermoid cyst of the spleen requires histopathological evaluation.

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Key words **: spleen, cyst, epidermoid.**

Splenic cysts are rare. They may be congenital, neoplastic, vascular, inflammatory and post-traumatic in origin. They contribute 30-40% of the total splenic lesions. Congenital splenic cysts are usually asymptomatic and they are rarely seen. They are more often discovered incidentally due to lack of typical clinical presentation. They constitute approximately 10% of total splenic cysts and are encountered more commonly in children and young adults. They are reported to have a good prognosis[1].

We report a case of epidermoid splenic cyst which was managed by laparoscopic splenectomy.

Case Report

A 21-year-old female with no known comorbidities presented with complaints of vague, dull aching, intermittent, left sided abdominal pain of 2 weeks duration. She had no history of vomiting, abdominal distention or trauma. No significant general examination finding was noted. On local examination, a single non tender 12x12 cm mass was palpable in the left hypochondrium, extending up to the umbilicus,firm consistency, smooth surface and the superior border was not palpable.

USG abdomen showed gross splenomegaly with a large cystic lesion in the spleen measuring 17.2X13.1 cm.

CT scan showed (Fig 1) a grossly enlarged spleen with large predominantly inter-polar, near water density cystic lesion measuring 13X12.7X18 cm, suggestive of a splenic cyst with mild hepatomegaly.

An ultrasound guided aspiration of the cyst and pigtail catheter insertion into the cyst was done. The cystic fluid analysis was suggestive of epidermoid cyst of the spleen.

She was taken up for laparoscopic total splenectomy. Intra-operatively, mobilisation of the spleen was time consuming due to dense adhesions to surrounding structures especially at the area of the cyst. Post-operative period was satisfactory and uneventful.

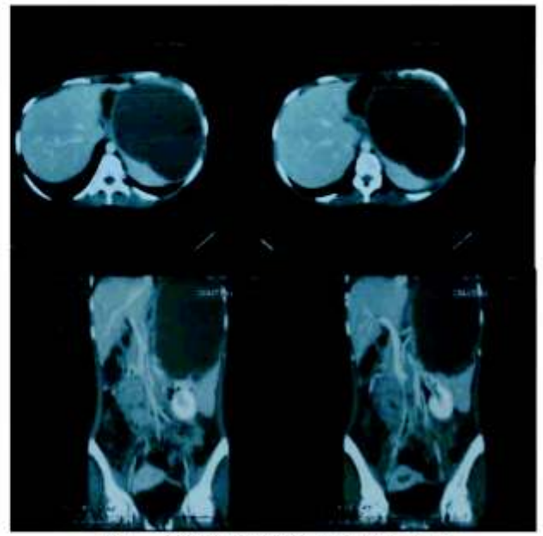

Fig 1 — CT scan showing the cyst in the spleen

Histopathological report (Fig 2) revealed fragments of spleen with multiple cysts lined by stratified squamous epithelium without adnexa containing laminated keratin. The wall of the cyst showed fibrosis with hyalinisation, confirming the diagnosis of epidermoid cyst of the spleen.

Discussion

Splenic cysts rare and epidermoid cysts of the spleen constitute 10% of splenic cysts.Epidermoid cysts are usually asymptomatic and may present with vague symptoms. Most of these cysts are incidental findings[2].

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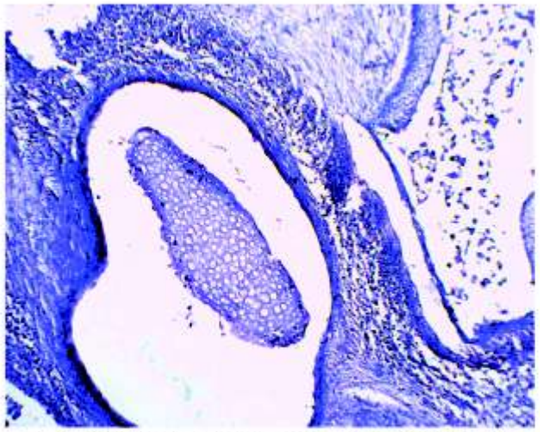

Fig 2 — Histopathological section of the excised cyst (H&E X 100)

Splenic cysts are classified (Fig 3) as Type I cysts (primary or true cysts) with cellular linings and Type II cysts (false or secondary cysts) without cellular linings. Type I cysts may be parasitic or non-parasitic in origin. Non-parasitic cysts may be congenital or neoplastic. Congenital cysts are classified further as epidermoid, dermoid and endodermoid cysts; and neoplastic cysts as hemangiomas and lymphangiomas. Epidermoid cysts are the rarest among all true splenic cysts[3].

The origin of true cysts is not very clear. They are said to develop from mesonephric tissue in the developing spleen during early embryonic life. Infolding or entrapment of peritoneal mesothelial cells in the splenic parenchyma during embryogenesis in the intrauterine life is the suggested mechanism of development. The age at presentation ranges from new-born to 50 years, with average age of around 17 years[4].

It is difficult to differentiate true from false cysts on imaging studies. False cysts tend to have thicker fibrous walls and eggshell like calcifications with internal debris. On USG, epidermoid cysts are well-defined, thin walled, anechoic cystic lesions. Increased echogenicity may be due to intra-cystic haemorrhage, cholesterol crystals and inflammatory necrotic debris (similar to those seen in false cysts). Computerized tomography gives a clearer picture regarding intra-cystic fluid, internal septations or calcifications. The final diagnosis of a splenic cyst always depends on histopathological examination of the cyst wall and not on imaging studies[4,5].

Partial splenectomy is a definite solution in treatment of cysts <5cm. Other conservative measures like aspiration and incision and drainage can be tried. Larger cysts of >5cm are best managed by total splenectomy as it prevents serious complications like rupture, haemorrhage, infection and recurrence of cysts. Splenectomy, thus remains a relatively safe procedure when the hilum of the spleen is involved[4,6].

In this case, suspecting an infective aetiology, conservative management was attemptedwith a pigtail catheter to aspirate and drain the cyst. Total laparoscopic splenectomywas decided considering the size of the cyst and positive histopathologic diagnosis of epidermoid cyst of the spleen.

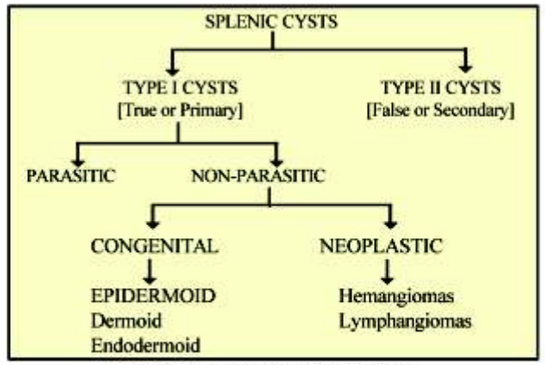

Fig 3 — Classification of splenic cysts

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Case Report

Acute myocarditis due to ingestion of nitrobenzene (paint solvent)

SV Birajdar[1], Gajanan Halkanche[2], Virendra B Aswar[3]

A case of acute poisoning with nitrobenzene is presented where clinical evaluation and timely management, with repeated intravenous methylene blue helped to save a life. Acute myocarditis,though not common in cases of nitrobenzene poisoning but presnting solely with this, is very rare. It is important to take care of the secondary cycling of nitrobenzene from body stores in patients presenting late, after heavy exposure.

[*J Indian Med Assoc* 2019; **117:** 29-30 & 32]

Key words **: Acute methaemoglobinaemia, methylene blue, nitrobenzene poisoning.**

Acute poisoning with nitrobenzene causing significant methaemoglobinaemia and acute myocarditis is uncommon but life threatening emergency. Early aggressive management of severe poisoning, strongly suspected on clinical grounds may change the outcome of a patient.

Case Report

A 30-year-old , conscious and drowsy female presented to Emergency Department of Swami Ramanand Teerth Rural Medical College and Hospital, Ambajogai Dist Beed, Marathwada, Maharashtra with mild cyanosis and a greyish-brown hue, laboured respiration of 26/min, BP 150/90 mm of Hg, pulse rate 90/min, pupils with normal size reacting to light and SpO_2 of 74% on air. Her chest was clear. Immediate BiPAP ventilation with 100% oxygen and improved the SpO_2 to 84% only. There was a history of severe pain in the abdomen, nausea, vomiting, dizziness, chest pain and palpitation. Blood samples drawn for ABG had a chocolate brown colour, which did not improve on exposure to 100% oxygen and showed compensated metabolic acidosis. On ECG heart rate is 90/min, Normal Axis, sinus rhythm with T wave inversion in 3, avL, V2-V6, PR interval 0.12,QTc 0.40, cardiac enzymes is 119.2 and WBC count is 20300, Platelet count 573000 and liver enzymes were slightly raised. Serum creatinine within normal range . A clinical diagnosis of severe acute methaemoglobinaemia with acute myocarditis of unknown origin was made.

Investigations

20/01/2013 : ABG Report-PH-7.42, PCO2-35mm of Hg, PO2-38 mmof Hg, HCO3-22.2, SO2-71%.

20/01/2013 : Serum Cholinesterase-8963.9, HIV-Non-Reactive.PT-14sec, INR-1.2.

20/01/2013 : BUL-20, Serum Creatinine- 0.8, Serum Bilirubin -1.5, SGOT- 36, SGPT-30.

20/01/2013 : Serum electrolytes-Na-137, K-3.3, Ca-1.15.

20/01/2013 : CPK MB- 119.2,

22/01/2013 : Hb-9.3% TLC-20300cu/mm, Platelets-573000cu/mm.

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25/01/2013 : Reticulocyte Count -1.3%,TLC-15600,Platelets-285000 cu/mm.

26/01/2013 : ABG Report-PH-7.44, PCO2-40mm of Hg, PO2-42mmofHg, HCO3-26.4, SO2 74%.

26/01/2013 : at 8 am Serum electrolytes-Na-139, K-3.4, Ca-1.12.

26/01/2013 : at 5 pm Serum electrolytes-Na-150, K-3.2, Ca-8.07, Mg-2.5.

26/01/2013 : BUL-25, Serum Creatinine-0.8.

24/01/2013 : CPK MB- 17.5.

26/01/2013 : 2DEcho within normal limit,

27/01/2013 : CPK MB- 20.

In 100 mg of methylene blue (prepared as 1% sterile solution) and ascorbic acid 500 mg were given IV. This improved her SpO_2 to 92%, which dropped after about three hours, when 50 mg IV methylene blue was repeated and intravenous dexamethasone 6mg 8hrly. Intravenous Vitamin K, 10% dextrose, and an antibiotic were also added. Urine output was maintained above 100 ml/hour with proper hydration and frusemide, maintaining a normal central venous pressure (CVP).

She became stable after six hours with a stable BP of 118/82 and HR of 80/minute. SpO_2 was again 91%. IV methylene blue (50 mg) improved SpO_2 to 97% over the next 15 minutes, only to return to 85% in the next three hours, with a similar response to another dose. Two units of fresh blood were transfused and this improved the SpO_2 to 92-94%. With this waxing and waning picture of symptoms, six hourly gastric lavage with charcoal, purgation with polyethylene glycol (peg leg), intravenous methylene blue every eight hours (three days) and then orally up to seven days, and IV ascorbic acid (500 mg) per day up to six days, was prescribed, till the smell of bitter almonds disappeared completely from the stools.

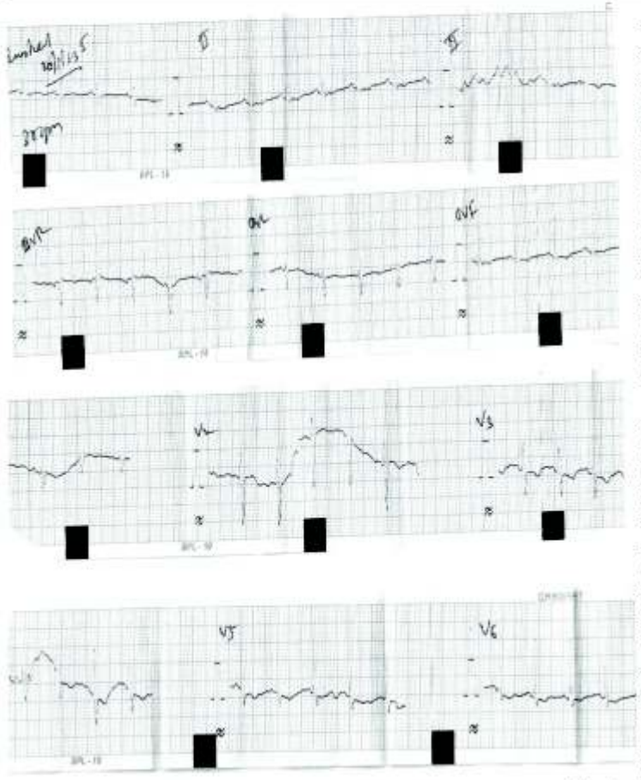
She improved rapidly after the seventh day with an SpO_2 of 98% on room air. She was discharged on the ninth day on oral iron, folate, ascorbic acid, and liver enzyme supplements and breathing exercises.

Discussion

Nitrobenzene, a pale yellow oily liquid, with an odour of bitter almonds is used as an intermediate in the synthesis of solvents, like paint remover. The first report of nitrobenzene poisoning came in 1886 and subsequent fatality reports followed[1,2]. Intoxication can

ECG findigs :

Date	Heart Rate	Axis & Rhythm	STT Changes	PR interval	QTc
20/01/2013	90/min	N/Sinus	T inversion3, avL,V2-V6	O.12	0.40
21/01/2013	75/min	N/Sinus	T inversion3, avL,V1-V3	o.12	0.36
22/01/2013	66/min	N/Sinus	T inversion3, avL,V1-V3	0.12	0.37
23/01/2013	60/min	N/Sinus	T inversion3, avL,V1-V3	0.12	0.34
24/01/2013	56/min	N/Sinus	T inversion3, avL,V1-V3	0.12	0.37
25/01/2013	50/min	N/Sinus	T inversion3, avL,V1-V4	0.12	0.54
26/01/2013	100/min	N/Sinus	T inversion3, avL,V1-V6	0.12	0.56



be accidental or suicidal, or the side effect of some drugs, including metoclopromide[2]. Accidental toxicity can occur in patients consuming well water with dangerously high levels of nitrites and nitrates[3]. The lethal dose is reported to range from 1 g to 10 g, by different authors[4,5]. A review of published reports does not provide any consistent reports regarding fatalities and dose of ingestion[5]. The toxic effects after ingestion are due to the rapid development of methaemoglobinaemia[4], a condition in which the iron within the haemoglobin is oxidized from the ferrous (Fe^{2+}) state to the ferric (Fe^{3+}) state, resulting in the inability to transport oxygen and causes a brownish discolouration of the blood[3]. Once formed, methemoglobin can be reduced enzymatically either via an Adenine dinucleotide (NADH)-dependent reaction, catalysed by cytochrome b5 reductase, or an alternative pathway utilizing the nicotine adenine dinucleotide phosphate (NADPH)-dependent methemoglobin reductase system[2].

Acute intoxication is usually asymptomatic up to the level of 10-15% of methemoglobin, showing only cyanosis. Beyond 20%, headache, dyspnea, chest pain, tachypnea, and tachycardia develop. At 40-50%, confusion, lethargy, and metabolic acidosis occur leading to coma, seizures, bradycardia, ventricular dysrythmia, and hypertension. Fractions around 70% are fatal. Anemic or G6PD-deficient patients suffer more severe symptoms[2,4]. Leukocytosis has been reported, with relative lymphopenia[4]. Other effects include hepatosplenomegaly, altered liver functions, and Heinz body haemolytic anaemia[2,6]. Nitrobenzene is metabolized to p-nitrophenol and aminophenol and excreted in urine, up to 65%, and in stools up to 15%, after five days of ingestion. Liver stomach, blood, and brain may act as stores and release it gradually[6]. Clues for diagnosis include a history of chemical ingestion, the characteristic smell of bitter almonds, persisting cyanosis on oxygen therapy without severe cardiopulmonary disease, low arterial oxygen saturation, with normal ABG (calculated) oxygen saturation. Dark brown blood that fails to turn bright red on shaking, which suggests methaemoglobinaemia and this is supported by the chocolate red colour of dried blood. Presence of nitrobenzene compounds may be confirmed spectrophotometrically and estimated by the butanone test of Schrenk, methemoglobin levels in the blood, and urinary presence of p-nitrophenol and p-aminophenol[1,6,7].

Recommended treatment is based on the principles of decontamination and symptomatic and supportive management. Methylene blue is the antidote of choice for the acquired (toxic) methaemoglobinaemia. It is an exogenous cofactor, which greatly accelerates the NADPH-dependant methemoglobin reductase system and is indicated if the methemoglobin levels, which are more than 30%[4]. It is administered intravenously at 1-2 mg/kg (up to 50 mg dose in adults,) as a 1% solution over five minutes; with a repeat in one hour, if necessary. Methylene blue is an oxidant at levels of more than 7 mg/kg, and therefore, may cause methaemoglobinaemia in susceptible patients. It is contraindicated in patients with G6PD deficiency, because it can lead to severe haemolysis. Ascorbic acid is an antioxidant that may also be administered in patients with methemoglobin levels of more than 30%[8]. In recent studies, N-acetylcysteine has been shown to reduce methemoglobin, but it is not yet an approved treatment for methaemoglobinaemia. Exchange transfusion is indicated in severe cases[4,8]. Hyperbaric oxygen is reserved only for those patients who have a methemoglobin level >50% or those who do not respond to standard treatment[2].

In this case, repeated low dose methylene blue helped in tiding over the fluctuating symptoms due to the release of nitrobenzene from the body stores, without exceeding the maximum dose. Fresh blood transfusion improved the oxygen carrying capacity and haemoglobin content, improving the patient symptomatically. Oral charcoal and purgation up to five days helped to eliminate the body stores of nitrobenzene and prevented secondary deterioration in the patient, as reported in some cases[1,2]. Taking care of nutrition, adequate urine output, and hepatoprotection prevented kidney and liver failure, which have been cited as late effects. Forced diuresis led to a rapid fall in methemoglobin levels and improved discolouration[1,6]. Ascorbic acid supplements are useful for follow-up management of methaemoglobinaemia[9].

(Continued on page 32)

Case Report

A rare case of Fahr's disease presenting with seizure disorder

Arindam Datta[1], Th Premchand Singh[2]

Fahr's disease also known as striopallidodentate calcinosis is a rare neurodegenerative disorder characterised by bilateral and symmetrical calcium deposits in different areas of the brain, particularly in the basal ganglia. We report an unusual case of Fahr's disease in a middle aged male who presented with seizure disorder which is again a rare presentation of Fahr's disease. The patient was diagnosed as a case of idiopathic calcification of Basal ganglia or Fahr's disease based on clinical and radiological criteria in the absence of biochemical abnormalities.

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Key words **: Fahr's disease, Idiopathic calcifications of Basal ganglia, Seizures.**

Fahr's disease is a rare clinical entity consisting of certain metabolic, biochemical, neuroradiologic and neuropsychologic phenomenon characterized by symmetric calcifications of white matter of brain. The globus pallidus within the basal ganglia is the most frequent site of calcification, but deposits may be present in putamen, caudate nucleus, internal capsule, dentate nucleus, thalamus, cerebellum and also cerebral white matter. Fahr's disease may be sporadic or familial and may lead to neurological, psychiatric and cognitive abnormalities. Familial Fahr's disease may have autosomal recessive or autosomal dominant transmission. The expressivity within the family is variable and the age of the onset is decreasing in the family in case of the autosomal dominant inheritance.

Fahr's disease has been described for the first time by Fahr (German neurologist) in 1930 of a man with seizures and diffuse calcifications of the brain vessels and vessel ganglia[1]. Fahr's disease should be differentiated from Fahr's syndrome which is defined as symmetric and bilateral calcification of the basal ganglia associated with neuropsychiatric manifestations that preferentially occur in patients with parathyroid disorder, especially hypoparathyroidsm. Headache, vertigo, movement disorders, paresis, stroke like events, cognitive impairment, psychiatric disorders, pyramidal signals and seizures are the most common manifestations[2,3]. The other causes of basal ganglia calcification are infections (tuberculosis, AIDS, EB virus), hypoparathyroidism, hyperparathyroidism, tuberous sclerosis, lupus and motor neurone disease.

Here, we report a rare case of Fahr's disease who is a known hypertensive presented with seizure disorder of recent onset.

Case Report

A 50 years old male attended the hospital with complaints of three episodes of sudden onset of tonic clonic generalized seizure, at his residence the previous day with momentary loss of consciousness during all the three attacks. He did not give any history of fever, headache, vomiting nor any history of head injury in the past. The seizure was not associated with motor deficit nor any behavioral change. He gave a past history of acute gastroenteritis and generalized weakness associated with mild hypokalemia about seven months back. None in the family including his 7 siblings suffer from seizure disorder.

Examinations — Patient was conscious and well oriented. General physical examination revealed no abnormality. Central nervous system examination was within normal limits. There was no motor or sensory deficit, no sign of cerebellar dysfunction, nor any movement disorder. There was no sign of meningeal irritation. Fundoscopy was normal . The score of Mini-mental state examination was 24.

Blood haemogram was normal, serum glucose were fasting 82 mg/dl and postprandial 100 mg/dl, S. creatinine 1mg/dl and urea 24mg/dl, S electrolytes (sodium139 mmol/L, potassium 4.2 mmol/L ,calcium 4.85mg%, phosphate 3.7 mg%, magnesium 2.1 meq/L) were within normal limits. Serum liver function tests and lipid profile showed no abnormality. Serum thyroid stimulating hormone was 3.41miu/ml, serum parathormone was 32.5 pg/ml and HIV I&II, ANA, and TB PCR were all negative. Urine routine examination was normal. CT scan of brain revealed multiple calcifications of the basal ganglia, dentate nuclei of the cerebellum, caudate nuclei, globus pallidum and thalamus bilaterally (Fig 1) which is consistent with Fahr's disease. EEG showed nonspecific changes of seizure disorder. In the absence of biochemical abnormalities, infectious, toxic or traumatic causes of multiple calcifications of the brain the patient was diagnosed as Fahr's disease.

Discussion

Fahr's disease has a broad spectrum of clinical neurological presentation. Patients can present with movement disorders, executive and cognitive impairment, seizures, pyramidal symptoms, cerebellar signs and other different presentation depending on the part of the brain affected[4]. Our patient presented with generalized tonic clonic seizure without any known etiology. Cases presenting with seizure disorders in Fahr's disease has been reported in the literature[5-7].

The diagnostic value of EEG has been evaluated in patients with Fahr's disease. The EEG results yielded no discernible diagnostic value and all kinds of alterations of central electrophysiological activities were possible, but no characteristic EEG pattern asso-

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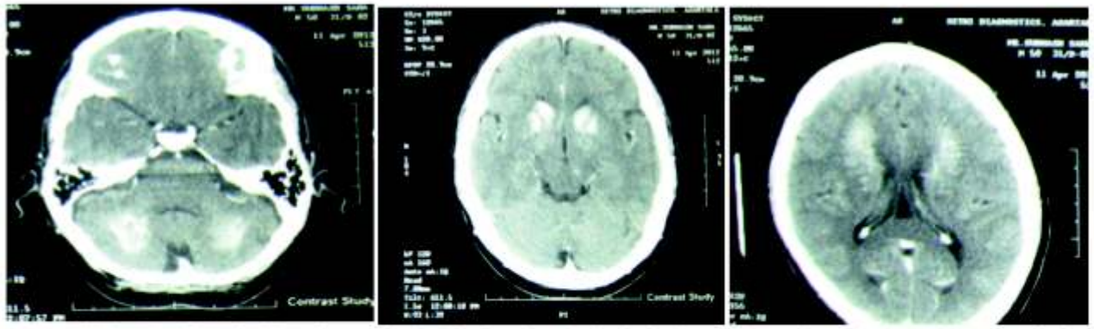

Fig 1 — CT Scan Brain showing bilateral symmetrical calcifications in cerebellar hemisphere, caudate nucleus and periventricular areas of brain

ciated with Fahr's disease was seen[6]. In this present case a non specific pattern of seizure disorder was seen in EEG

Fahr's disease may have familial aggregation, with autosomal recessive or autosomal dominant transmission – Geschwind and his colleagues[8] have described a locus IBGC1 on chromosome 14q involved in the idiopathic basal ganglia calcification. Fahrs disease is diagnosed by exclusion of other conditions with intracerebral calcifications by appropriate investigations. These conditions include endocrinopathies (hypothyroidism, hypogonadotrophic hypogonadism), systemic diseases (systemic scleroderma, systemic lupus erythematosus), infections (toxoplasmosis, neurocysticercosis, German measles, neurobrucellosis, HIV), primary or secondary calcified brain tumors, and various diseases such as tuberous sclerosis, mitochondrial encephalopathy, myotonic muscle dystrophy, measles and smallpox encephalitis, post-anoxia disorders, phacomatosis, Cockayne syndrome, neonatal anoxia, idiopathic hemochromatosis, heavy metal and carbon monoxide intoxication, treatment with methotrexate, and radiotherapy[9].

Conclusion

Fahr's disease is a very rare clinical entity and it is mostly associated with movement disorder and neuropsychiatric manifestations. A rare case of Fahr's disease with seizure disorder is reported.

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Case Report

A rare case of vaginal dermoid cyst

Urvashi Barman Singh[1]

Vaginal dermoid cyst is a rare condition. Ultrasound is the investigative tool for this condition which may be treated surgically through a transvaginal approach. We report a case of vaginal dermoid cyst.

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Key words **: Vaginal dermoid cyst.**

The finding of paravaginal dermoid cyst is rare in gynecology practice. The key in the management is the preoperative assessment using transvaginal ultrasound, and the appropriate surgical intervention. We report a case of vaginal dermoid cyst and the surgical procedure in its management.

Case Report

A 30 year-old non-pregnant P 3+1 with previous vaginal deliveries woman presented to us with complaints of something coming out of vagina since 1 year. On performing a gynecological exam.a vaginal cyst 3 X 2 inches was seen in the posterior wall.

An ultrasound was requested which showed a non-vascular mass measuring 8.4 cm. by 7.5 cm by 6.1 cm, with low level echogenic material as well as echogenic bands, situated within the posterior wall of the vagina, in the rectovaginal space; the rest of the pelvis was normal; with an impression of a dermoid cyst.

She was sexually active with history of dyspareunia for last 1 year, prior to that she was sexually active without any problems. The remainder of her history was non-contributory.

Under general anesthesia this cyst was removed. Incision was made on the vaginal mucosa on top of the mass ex-tended toward the cervix, measuring approximately 6 cm. The mass surface was identified, blunt dissection was carried out (Figs 1&2), the mass ruptured revealing a sebaceous material which was extruded and collected in a bowl. The cyst wall was then dissected free from the rectovaginal space with good homeostasis . Incision was sutured with a running locked 0 Vicryl suture, and a vaginal pack was inserted.

The patient was discharged the next day after removing the vaginal pack in good condition.Histopathological examination of the cyst wall, showed keratinized stratified squamous epithelium. Subepithelium show fibrocollagenous tissue and lymphomononuclear cell infilterate. There were few sebaceous and apocrine glands noted. The findings were consistent with a diagnosis of a dermoid cyst.

Discussion

Vaginal cysts are classified microscopically, according to their epithelial lining, as: Mullerian, epidermal inclusion, Gartner's duct remnants (mesonephric), Bartholin's duct, endometriotic and other rare types[1], including dermoid cyst, ectopic ureterocele, paraurethral cyst and unilateral hematocolpos.

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Fig 1 — Vaginal wall cyst of 3x2 inches seen is posterior wall

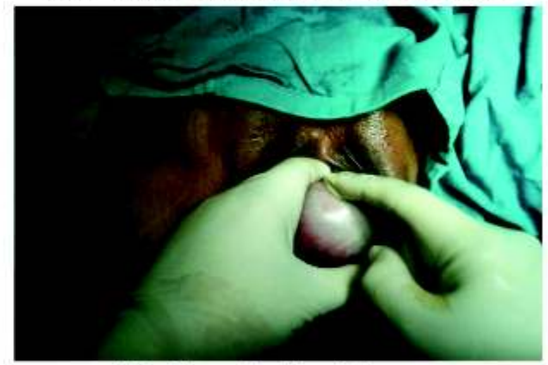

Fig 2 — Postvaginal wall cyst during surgery

A dermoid cyst (Benign cystic teratoma) is a benign germ cell tumor that contains well-differentiated deriva-tives of all three germ cell layers.

Ovaries are the commonest site for this tumor, where it is the commonest neoplastic tumor in children and adolescent accounting for more than half of ovarian neoplasms in women younger than 20 years of age. More than 80% of ovarian benign dermoid cysts occur during reproductive years.

A dermoid cyst has also been reported from other parts of the human body other than the ovaries, with rare occurrence. It can be any where in the gastrointestinal tract from the floor of the mouth to the colon[2,3].

Dermoid cysts have also been reported in male patients, in different parts of their body[6].

Vaginal dermoid is a rare condition. Only five cases have been reported in English literature. First observed in 1899 by Stokes[9], who reported a 44 year old woman who had a 1 centimeter cyst removed from just within the hymen. The cystic contents showed neumerousseba-ceous glands and a few hair follicles. Curtis[1] described an ulcerated orange-sized necrotic cyst, containing hair and sebaceous materials in the vaginal mucosa. Johnston[5] described a 4-inch cyst that passed from the vagina in a woman following delivery of her second child. The cyst was filled with thick sebaceous material with matted hair and had been attached to the vaginal wall by a narrow stalk. Hirose *et al*[4] reported another case, having repeated painful right vaginal wall cyst, which was excised and was found to be a dermoid cyst confirmed by histopatological examination.

Preoperative diagnosis of the exact nature of a vaginal cyst can be difficult. SSN SIU *et al*[8] reported the sonographic characteristics of a vaginal cyst, which was consistent with a dermoid cyst and was confirmed by histopathological exam after surgical excision of the cyst. The same sonographic features were found in our case.

Transvaginal excision of this type of cyst appears to be an appropriate surgical treatment option which was inconformity with some of the previous cases[4,8,9].

Conclusion

Vaginal dermoid cyst is a rare condition, which can be diagnosed with ultrasound. Transvaginal excision appears to be an appropriate surgical treatment option.

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Case Report

Oculo-auricular-fronto-nasal syndrome – a new entity

Sujata Chahande[1], Ramesh Murthy[2]

We describe a unique combination of fronto nasal malformations and oculo auricular vertebral syndrome without any vertebral defects and with bilateral involvement of eyes. The oculo auricular vertebral syndrome manifests with defects of the first and second branchial arches including hemifacial microsomias and Goldenhar's syndrome. We describe the clinical features in a 6-year-old male child with lid colobomas, ocular dermoids and dermolipomas, hearing defects, zygomatic hypoplasia but with bilateral involvement and absence of heart disease, absence of encephalocoele and without any maxillary or mandibular hypoplasia. We name this unique entity as Oculo-auricular-fronto-nasal syndrome.

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Key words **: Corneal dermoid, lipodermoid, preauricular skin tags, lid coloboma, zygomatic.**

Fronto-nasal malformations (FNM) is a developmental field defect representing abnormal morphogenesis of the fronto-nasal eminence while oculo-auricular-vertebral spectrum (OAVS) describes a more broader range of the first and the second branchial arch defects including hemifacial microsomias and Goldenhar's syndrome[1].We describe a 6 year old boy with a rare combination of features of fronto-nasal malformations (FNM) and oculo-auricular vertebral syndrome(OAVS) without any vertebral defects and with a bilateral involvement. The uncommon features in our patient was the absence of heart disease, absence of encephalocoele, bilateral involvement, no maxilla or mandibular involvement with the presence of zygomatic hypoplasia.

Case Report

A 6 year old male patient born of non- consanguineous marriage presented with congenital deformities of upper eyelids, preauricular skin tags and ocular dermoids. There was no positive family history of similar eye anomalies.

Examinations — Patient had vision of finger counting more than 3m in each eye. There was bilateral total complete upper lid coloboma which was quadrangular involving medial third of upper eyelid and about one third eye lid width (Fig 1). Patient had broad dorsum of nose and hypertelorism along with telecanthus. The conjunctiva showed presence of a lipodermoid temporally in the right eye lateral fornix along with a limbal dermoid located at the inferior limbus from 5 to 7 o'clock which was confluent with the lipodermoid. In the left eye there was a limbal epithelial dermoid at the inferior limbus from 4 to 8 o'clock encroaching on the cornea upto the mid pupillary zone. There was no sign of exposure keratitis.The pupils were briskly reacting to light. Patient's intraocular pressures were found to be normal. Fundus examination revealed the presence of tilted optic disc in both eyes. The ocular motility was normal.

Patient had multiple pre auricular skin tags, four on the right side and two on the left with no external ear deformity (Fig 2). Patient had left hemi-facial microsomia with misaligned teeth along with cleft palate. There was decreased hearing due to conductive deafness. The upper and lower jaws were normal but with zygomatic hypoplasia. The patient had delayed milestones.

X-Ray of the skull confirmed the presence of bilateral zygomatic hypoplasia with normal maxillary and mandibular bones. X Ray spine did not show any vertebral anomaly. Computer aided tomography of brain was normal.

Discussion

The minimum clinical features for the diagnostic confirmation of Goldenhar's syndrome is the presence of unilateral ear involvement (microtia) together with preauricular tags[2]. Ocular abnormalities associated with Goldenhar's syndrome include microphthalmia, anophthalmos, epibulbar dermoid and lipodermoid and strabismus[3]. Bilateral ocular involvement which was present in our patient, is rare 10%[4].

Fig 1 — Face photograph of a 6 year old boy with bilateral total complete upper lid coloboma, broad dorsum of nose and hypertelorism along with telecanthus, lipodermoid temporally in the right eye lateral fornix along with a limbal dermoid located at the inferior limbus & a limbal epithelial dermoid at the inferior limbus in the left eye & 2 preauricular skin tags on left side

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Fig 2 Face photograph of a 6 year old boy right lateral view with multiple pre auricular skin tags, four on the right side with no external ear deformity with misaligned teeth along with cleft palate and with no corneal exposure on eyelid closure

The NORD studies suggest that in individuals with this disorder, craniofacial malformations resulting in facial asymmetry (hemifacial microsomia) is progressive and initially affects bone and soft tissue of lower jaw (mandibular hypoplasia). As the disease process progresses, asymmetry of the lower jaw becomes more pronounced and causes associated malformations of upper jaw (maxilla), nose and orbit. Our patient was unique as he had no maxilla or mandibular involvement but had zygomatic hypoplasia. Zygomatic hypoplasia has classically been described as a feature of Treacher-Collins Syndrome. In addition the child had conductive hearing loss and cleft palate which is common to both Goldenhar's syndrome and Treacher- Collins syndrome[2,3].

The absence of vertebral involvement is another unique feature of this case. The incidence of vertebral involvement in Goldenhar's Syndrome is reported to be as high as 40%. However some studies mention that there was no absolute correlation between the presence of any of the formative or segmentation vertebral defects and that of other concomitant malformations and thus patients with various groupings of Goldenhar related anomalies should be considered a single entity to which Goldenhar's association could be applied[7].

Conclusion

To conclude, though the present case does not have all the features typical of Goldenhar's Syndrome or Treacher-Collins Syndrome, it is unique in the presentation of bilateral involvement, zygomatic hypoplasia without vertebral and spinal involvement. We would therefore describe it as Goldenhar's Syndrome having a unique syndrome pattern or a distinct entity. We would like to label this entity as 'Oculo-Auriculo-Fronto-Nasal Syndrome'.

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Immunization Schedule Recommended by IMA[1,2]

The following is the recommended immunization schedule for children from birth through 18 years according to the recommendations based on recent evidence for licensed vaccines in our country (Table 1).

Table 1: Recommended immunization schedule for children aged 0–18 years[1,2]

Age	Vaccine	Dose	Route	Site	Remarks
Birth (within 24–72 h of birth)	BCG	0.05 mL	ID	Left upper arm	Conventionally given on this site
	OPV-0	2 drops	Oral		
	Hep B-0	0.5 mL	IM	Left thigh	Mandatory before discharge (preferably within 24–72 hours of birth)
6 weeks	DTwP/DTaP1	0.5 mL	IM	Anterolateral aspect of thigh	Use combination vaccines whenever possible
	Hib-1				
	IPV-1				
	Hep B				
	PCV10/13-1				
	Rota-1	0.5–2 mL	Oral	Squirt toward buccal mucosa	• If RV5/RV116E, 3 doses one month apart • If RV1, 2 doses one month apart • First dose of rotavirus vaccine not be administered after 16 weeks • Last dose of rotavirus vaccine not to be administered after 6 months for RV1, and not after 32 weeks for others
10 weeks	DTwP/DTaP2	0.5 mL	IM	Anterolateral aspect of thigh	
	Hib-2				
	IPV-2				2 doses of IPV instead of 3 doses if started at 8 weeks' age. If so, 2 dose to be administered 8 weeks apart
	Hep B				
	PCV10/13-2				
	Rota-2	0.5–2 mL	Oral	Squirt toward buccal mucosa	2 doses for RV1
14 weeks	DTwP/DTaP3	0.5 mL	IM	Anterolateral aspect of thigh	
	Hib-3				
	IPV-3				
	Hep B				
	PCV10/13-3				
	Rota-3	0.5–2 mL	Oral	Squirt toward buccal mucosa	RV5/RV116E is administered as 3 doses
6 months	Hep B	0.5 mL	IM		If following 0, 1, & 6 months schedule
	OPV-1	2 drops	Oral		
	IIV-1	0.25 mL	IM		High-risk groups
7 months	IIV-2	0.25 mL	IM		
9 months	OPV-2	2 drops	Oral		
	MMR-1/MR	0.5 mL	SC		After 270 completed days
	Meningococcal conjugate vaccine-1	0.5 mL	IM		High-risk groups
10 months	Typhoid conjugate vaccine-1	0.5 mL	IM		At least 1-month gap between MMR and TCV
12 months	Hepatitis A (killed or live)	0.5 mL	IM (killed) or SC (live)		Single dose for live hepatitis A
	JE-1	0.25 mL	IM		In endemic areas <3 years age
	Cholera vaccine		Oral		Hyperendemic/outbreaks: 2 doses administered 2 weeks apart and a booster dose after 2 years
13 months	JE-2	0.25 mL	IM		In endemic areas <3 years age
15 months	MMR-2	0.5 mL	SC		
	Varicella -1	0.5 mL	SC		
15–18 months	PCV- booster	0.5 mL	IM		
16–18 months	DTwP/DTaP-booster 1	0.5 mL	IM		Combination vaccines preferred
	IPV –Booster	0.5 mL	IM		
	Hib –Booster	0.5 mL	IM		
18 months	Hepatitis A (killed)-2	0.5 mL	IM		2nd dose only for killed vaccine
2 years	Typhoid conjugate-2 or Typhoid polysaccharide	0.5 mL	IM	Upper arm	• Polysaccharide typhoid vaccines repeated every 2–3 yearly • If a typhoid conjugate vaccine is being given the first time at/after 2 years, a single dose will suffice.
	Meningococcal-2	0.5 mL	IM		If meningococcal conjugate vaccine is being given at first time at/ after 2 years, a single dose will suffice
4–6 years	DTwP/DTap/Tdap booster 2				OPV up to 5 years of age
	MMR 3				
	Varicella-2				2nd dose of varicella may be given 3 months after first dose
	OPV-3				
9 years onwards (girls)	HPV				• If started before the 15th completed birthday, give 2 doses 6 months apart. • If started after the 15th completed birthday, 3 doses to be given. • If HPV4 -0, 2, 6 months. • If HPV2- 0, 1, 6 months.
10 years	Tdap/Td	0.5 mL	IM		Tdap is preferred over Td
16 years	Td/TT	0.5 mL	IM		Repeat every 10 yearly

OPV: Oral polio vaccine; DTwP: Diphtheria tetanus whooping cough pertussis; DTaP: Diphtheria tetanus acellular pertussis; Tdap: Tetanus toxoid dose of diphtheria (acellular) pertussis; Td: Tetanus diphtheria; DT: Diphtheria,Tetanus, and whole cell pertussis; Hib: Haemophilus influenzae type; IPV: Inactivated polio vaccine; IIV: Inactivated influenza vaccine; Hep B: Hepatitis B; Rota: Rotavirus; PCV: Pneumococcal Conjugate Vaccine; HPV: Human papilloma virus vaccine; MR: Measles Rubella; MMR: Measles, mumps, and rubella; MMRV: Measles, mumps, rubella varicella; BCG: Bacillus Calmette–Guérin

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Activities Report

IMA Kunnamkulam Branch organised World AIDS Day, UNICEF day, Mobile E Help, World Patient Safety day, Christmas celebrations, CME

IMA Sulthan Bathery Branch Organised CME on current concept in management of Endometrial Carcinoma

Installation ceremony of New office bearers of IMA Coimbatore Branch for the year 2019

IMA Palakkad Branch organised PROTEST DAY & CME on Proton Pump Inhibitors

JIMA January, 2019 issue Release Ceremony at New Delhi : In presence of Dr Santanu Sen, MP & National President, Dr R V Asokan, Hony Secretary General, IMA HQs, Hony Editor, JIMA and other leaders of IMA

IMA Kottakkal Branch organised ALL INDIA PROTEST DAY on 4th January, 2019, School health programme & CME

IMA Trivandrum organised Organ Donation Programme, Free medical camp in Police control room, Ambulance Inauguration, School Health Programme

IMA Tirurangadi observed World Leprosy Day & CME

IMA Vadakara Branch organised the Protest Day, CME, Life support training, Community service day, Health class, Vaccination for the nursing and paramedical staff, Celebrated Republic Day, Commemorate Martyrs Day,

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