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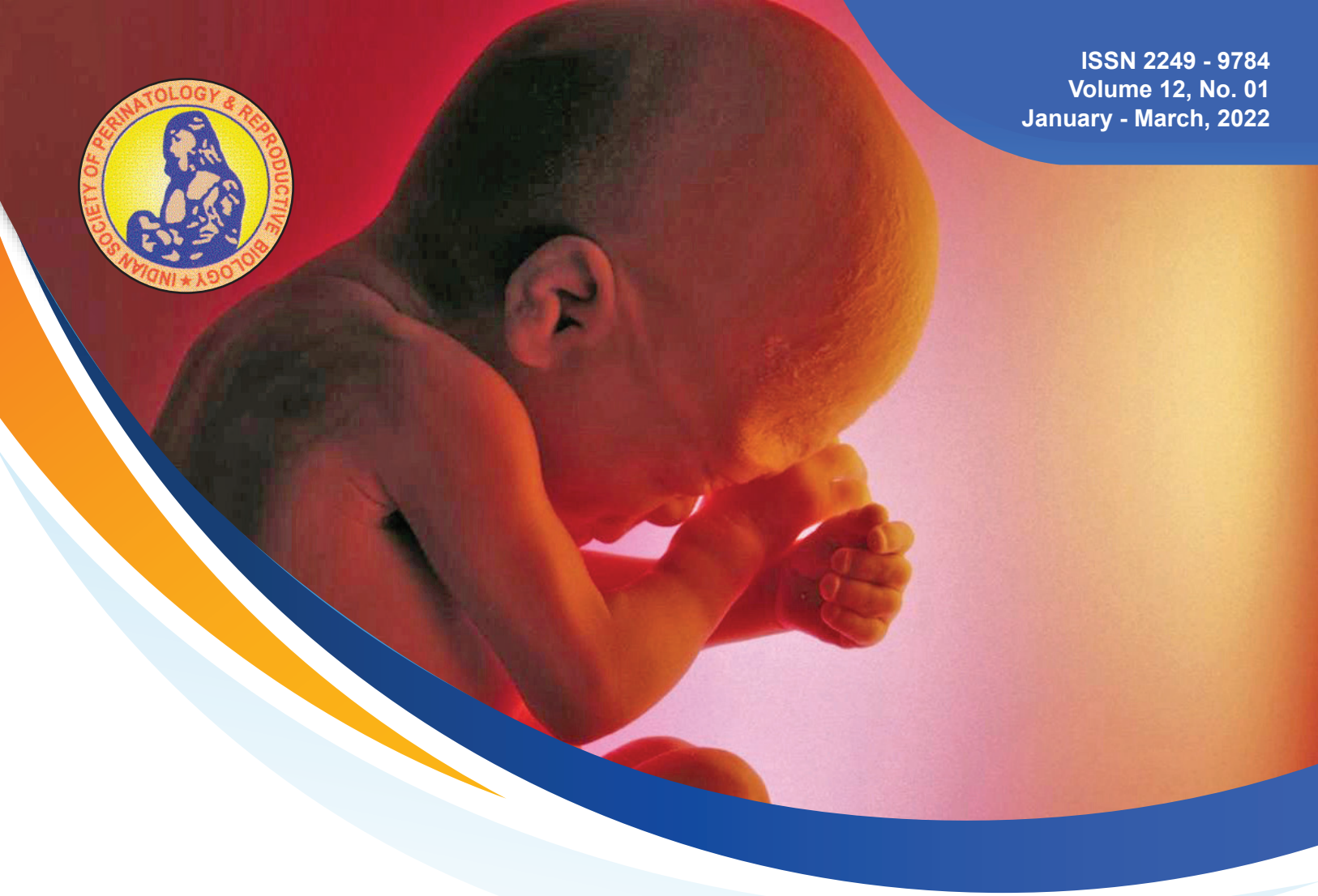

IJOPARB

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Editor's Choice

Tuberculosis Through Ages

Prof. (Mrs) S.N. Tripathy

"Tuberculosis is Ebola with wings, can affect any tissue of the body, any where in the world."

Tuberculosis has affected man kind from very ancient times. Man has continued to live in a state of uneasy equilibrium which can be easily disturbed in favor of the disease. Neither man nor the bacillus has shown sufficiently strong supremacy to win this battle. It is as old as mankind. Soma, the Moon God, suffered from "Tuberculosis". It is mentioned in Yajurveda. Hymn in Rig Ved is there to cure Yakhma. Recent Data reveals that TB existed 40,000 years ago, which corresponds to the period subsequent to the expansion of Homo sapiens out of Africa. Its existence is evident in Neolithic manand, Mummies of 5000 BC. Sushrut (600 BC) described the disease and opined difficult to cure. Hippocrates (460-377 BC) opined, there is no cure for the disease. Raj yaksma (India), Phthisis (Greek), consumption (Latin) and the White Plague are all terms used to refer to Tuberculosis through out history. Treatments varied from good food, clean air, herbs, mantra, tantra to touching of the king's feet on Scrofula, (gland TB on the neck.)[1]

The disease graduated from hereditary to infectious status after the discovery of its causative organism, to the bewilderment of the entire world when a dwarfish bespectacled stocky built scientist,. Robert Koch discovered the tubercle bacillus under the microscope and told to the whole world that it is not an hereditary disease but an infectious airborne respiratory disease, can affect every organ of the body except the hair and nails. After 50 years, the drugs followed in quick succession. Then a complete fullstop for nearly forty years. Who wants to develop a drug for poor countries, poor people, with tremendous cost than the ordinary drugs with low profit.

Fig I, Touching of kings' feet.

Till date Tuberculosis is considered as a major global health problem and an important cause of morbidity and mortality in high burden countries including India. WHO Report of 2018 is, there were 10 million estimated new cases with 1.5million deaths world wide making it the topmost infectious killer. About 4000 people die and 30,000 people fall ill every day. There were an estimated 2.7 million TB cases in India with .45 million deaths in 2018.[2]

India has the largest number of tuberculosis infected cases in the world. Still Tuberculosis is a Social taboo. People do not want to disclose that they are suffering

Corresponding author : Prof. (Mrs) S.N. Tripathy

Fig II. Robert Koch

from tuberculosis. Neither we give it a status in our conferences and seminars. I failed to secure an hour slot for the topic in 8 halls in 3 days program of the AICOG held in Bhubeneswar, I was the adviser to scientific committee of the conference.

WHO declared it as global health emergency in 1993. Many foundations like Bill Gates and MIllinda foundations joined hands to work against tuberculosis. It was 'high time to sow new seeds now as all the low hanging fruits have been eaten ' The initiative of setting up bodies like Global Alliance of TB drug development (2000) have started to discover new drugs in a vigorous way and several drugs came to treat the DS and DR patients, Bidalaquine came as a drug to treat MDR tuberculosis, Pa, a bactericidal drug which even kills the MDR bacteria in HIV positive patient, Linezolid and moxifloxacin and many others.

The progress so far

More than 100 years after it's discovery, tuberculosis infection has attained the status of a notifiable infectious disease in India in 2012. ACMS activities has been boosted up and a new logo of RNTCP has come in stead of the previous one. Govt. Decision and vision '**TB Free India**".

WHO adopted End TB strategy to end the global TB epidemic by 2035. zero deaths, diseases and suffering due to tuberculosis. WHO released the use of Gene Expert for pulmonary tuberculosis in 2011.

Tuberculosis is a bacterial infection usually caused by, Mycobacterium tuberculosis. and sometimes by M. bovis. They are also called the tubercle bacillus, because they cause lesions called tubercles. The mycobacteriums are obligate aerobes with a replicating cycle on the order of 17 –24 hours which is a prolonged period than the other bacteria's. and are characterized by their acid-fast staining. They look red under the microscope. Through out the body the microscopic picture is similar, the tubercles consists of granular inflammation, Langhans Giant cells, Epitheloid cells and central caseation associated with chronic inflammation.

Currently available new TB tests represent great advance but not yet replaced the older tests. Our gold standard of the diagnosis is still the same as before -Isolation of Mycobacterium tuberculosis by culture. -Histopathology, and by Laparoscopy's definitive signs.

Culture is the gold standard and it is done in various ways like LJ Culture, -BACTEC, MIGT (Liquid culture) -PCR. Rapid detection and quantification, requires only 1-10 bacteria/ml. Sensitivity > 90%, Specificity> 98%, Result within 6 hrs. The newer one is Gene Xpert MTB/RIF System, A cartridge based nucleic acid amplification test (CBNATT), WHO approved it and recommended it for rapid diagnosis of DR and MDR pulmonary tuberculosis cases in 2011 and in EPTB in 2013. We are now using it to diagnose FGTB too. FGTB, results are not promising. Senisitivity-30 % Specificity almost 100 %., higher cost, negative report due to blood contamination.

Now Line probe Assay has also came into being.

Contact Tracing

A new method is introduced to detect tuberculosis in its earliest stage,, so that treatment is given early and elimination is easier. If a person or a relative is in contact with a tuberculosis patient, the Govt.

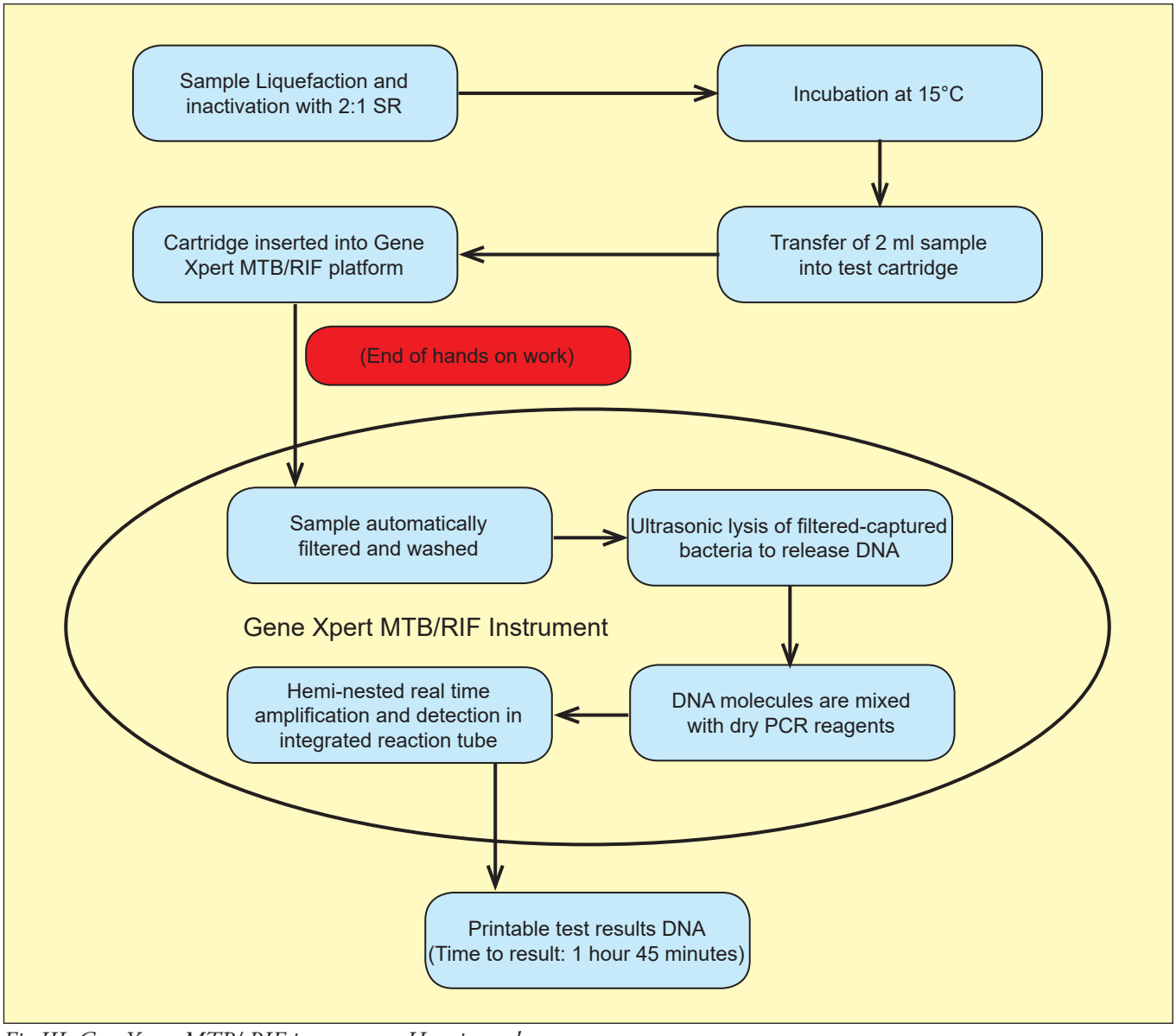


Fig III, GeneXpert MTB/ RIF instrument, How it works.

has introduced a method of checking them for tuberculosis in their nearest chest clinics. The tests are Mountoux test, Chest X-Ray. T-SPOT- TB Test and QuantiFERON - TB Gold Test. This test is not affected by prior BCG vaccination. C - TB test, a skin test, which overcomes the limitations of TST and IGRA. It uses recombinant ESAT -6 and cFP-10 proteins. Low cost, high specificity. Other tests are on the pipeline.

Chemotherapy, the treatment of choice. Clinicians should refer to the current RNTCP guidelines, recently the name changed to NTEP. DOTs (Daily dosing regimens) are being introduced now in RNTCP, previously it was thrice weekly regimen. The whole country is covered, and electronically monitored.

- Drugs- 2EHRZ/4EHR
- Duration- 6 months
- Daily Dose Regimen.
- Fixed dose combinations (FDC) doses is preferable. FDCs are distinct from combination packs (Combi packs). Now Streptomycin is removed from the first line group of drugs.

MDR TB

It is much easier to prevent MDR TB than to treat it in sophisticated institute for longer period with costlier drugs with more toxicity, resulting in hardly 50% recovery. Method is simple i.e., adopting standardized, up-to-date, proven, evidence based 4 drug regimen for treating TB cases. And for that reason, the physicians, the patients, the pharmaceuticals and the Government

has to be aware of the problem A case with MDR TB having resistance to any one of the second line injectable (Kanamycin, Capreomycin and Amikacin) and any one of the fluroquinolones (WHO 2006) is known as XDR –TB which is very difficult to treat.

Management:

The WHO 'End TB strategy' has set targets for eliminating TB with 80 % and 90 % reduction in incident rate and as well as 90 to 95 reduction in mortality rate by 2030 and 2035 respectively. The government of India intends to end TB by 2025 which is a well appreciated initiative. For that WHO had initiated the Universal Drug sensitivity testing by those two molecular tests, by CBNAAT for rifampicin resistant and LIPA to detect MDR and XDR Tuberculosis.

When WHO started the DOTs Regimen, the criteria was there should be National Tuberculosis Programme (NTP) in the country. India is the first to introduce the National Tuberculosis progamme, from 1962 and it continued till 1997. On those days the main programmes were Tuberculin skin test and BCG vaccination and implementation of short course chemotherapy. In 1997 it was renamed Revised National Tuberculosis programme (RNTCP). During this period many new medicines came out. Thrice weekly DOT's Regimen was introduced. In 2020 January The India Government renamed it as National Tuberculosis Elimination programme. (NTEP).

Various trials are ongoing to design innovative shorter regimens containing newer and repurposed drugs that can serve the purpose to treat drug sensitive and drug resistant TB cases favoring an universal treatment approach. These trials are conducted by Research Excellence to stop Tuberculosis resistance (RESSIST – TB), an initiative adopted under End – TB strategy by WHO to promote and conduct research on therapy for rapid control of DR-TB. (2) Merits of Universal drug Regimens include shorter treatment duration as well as culture conversion time leading to decreased risk of transmission of infection among all forms of TB patients including HIV co infection and enhancement of streamlined care delivery. Pretomanid (Pa) is one of the promising newer drug that has shown to increase treatment success rates in MDR/XDR TB and can be considered as backbone of universal drug regimen. The Nix TB trial showed a cure rate of of 90 % after 5 to 7 months treatment with regimen containing Bdq, Pa, and Linzolid (Lzd) in XDR Tuberculosis cases. Current results of this greatly simplified and shortened all-oral regimen for drug resistant TB are encouraging in terms of both efficacy and safety. Patients with Extensively Drug Resistant (XDR) tuberculosis (TB) have had limited options for treatment and high mortality. Nix-TB is an ongoing open label study in South Africa of bedaquiline (400 mg qd for 2 weeks followed by 200 mg tiw), pretomanid (200 mg qd) and linezolid (1200 mg qd) given orally for 6 months and followed for two years. Given the significant burden of TB world wide coupled with unfavorable outcomes, it is vital to evaluate these universal regimens under programmatic conditions. It may be possible, they may help in eliminating tuberculosis from the surface of the earth.

There is no doubt that tremendous progress has occurred in the field of tuberculosis starting from screening, to prevention to diagnostic techniques to newer drug developments. Let us see, what progress has occurred in our branch.

Though late, the scientific community has realized that if EPTB and pregnancy is not handled properly TB can't be eliminated. EPTB constitute about 15-20 % of all TB cases, in immune competent patients and 50 % in immune suppressed patients. There is no uniformity in diagnosis and treatment of EPTB and it is raising problems for the control of TB. Hence Guidelines on extra-pulmonary tuberculosis for India was formulated for each EPTB, including Genital tuberculosis and that is released in 2016. The recommendations were made during a meeting of the INDEX-TB guidelines group in July 2015 at AIIMS, New Delhi. The Methodology Support Team apprised the guidelines panel of the methods used in conducting the systematic reviews, and advised on the interpretation of the evidence. WHO policy document 2013 adopted a GRADE system approach to arrive at recommendations for TB in Extra-Pulmonary sites (EPTB). The Genital Tuberculosis group suggested many investigations like HSG in infertility, FNAC etc, and concluded that the diagnosis of FGTB should be made based on any one of: Laparoscopic appearance typical for FGTB. Any gynaecological specimen positive for AFBs on microscopy or positive for Mtb on culture. Any gynaecological specimen with findings consistent with FGTB on histopathological

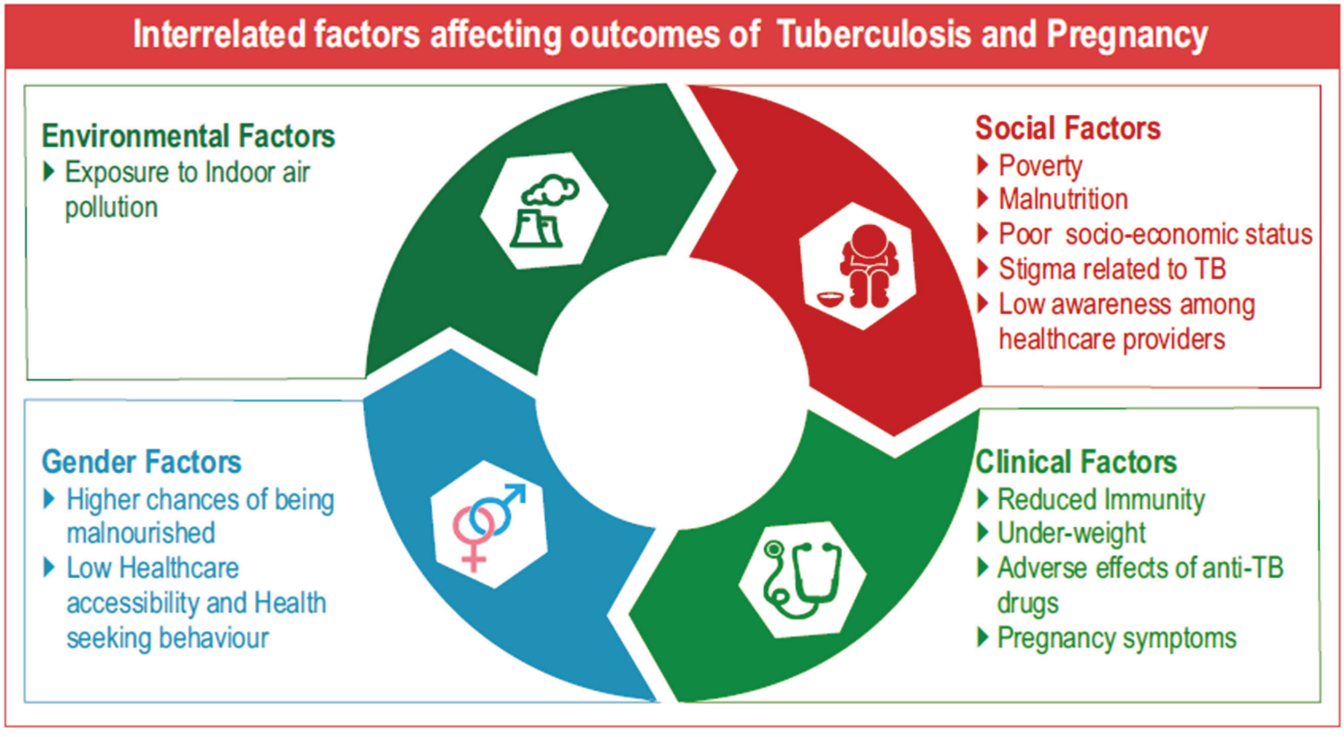


Fig IV

examination. PCR-based tests are increasingly used to diagnose FGTB. A literature review prepared for this guideline found that estimates of sensitivity and specificity varied widely across reports in the literature. The Technical Advisory Subcommittee for FGTB raised concerns about their experience of high rates of false positives when these tests are applied to peritoneal/gynaecological specimens. The committee has suggested, treatment neither should be started nor should be stopped only on the positivity or negativity of PCR. But nothing is a last word in science.

In a study done by J.B. Sharma et al, out of 177 cases of GT, gene Xpert was positive in 18.56% cases Gene Xpert had sensitivity of 35.63%, specificity of 100%, positive predictive value of 100% and negative predictive value of 58.82% and diagnostic accuracy of 66.47% in the present study. Gene Xpert is a very useful test to rule in tuberculosis whereas when it is negative it is not a good test to rule out tuberculosis.[3]

To find out the magnitude of the problem in pregnant women and how to manage the issues, Collaborative Framework for Management of Tuberculosis in Pregnant Women, Feb 2021 was produced jointly by the Central TB Division (CTD) and Maternal Health (MH) Division of Government of India Ministry of Health and Family Welfare.

Early diagnosis and treatment of TB in pregnancy would not only reduce the adverse effects of maternal TB, but also reduce overall burden of childhood TB in India. For this the national guideline has been developed. As tuberculosis has many factors to its management the collaborative group considered the inter related factors which affects its outcome like, Social, Environmental, Gender and clinical factors. (FIG IV). They have integrated TB and MH services in primary, secondary and Tertiary services. (FIG IV). They have also formulated guidelines how to manage DR pregnancy cases. (FIG VI).

Another major decision they have taken is Universal Screening for tuberculosis in pregnancy. The collaborative group recommended it on 21st April 2022, The screening test will not be Mountax test but C- TB skin Test.

Tuberculosis and Covid-19

Covid 19 is the largest pandemic witnessed by the world in more than a century, but one should not forget tuberculosis which is an already existing pandemic for hundreds of years. From 2015 to 2019, The health

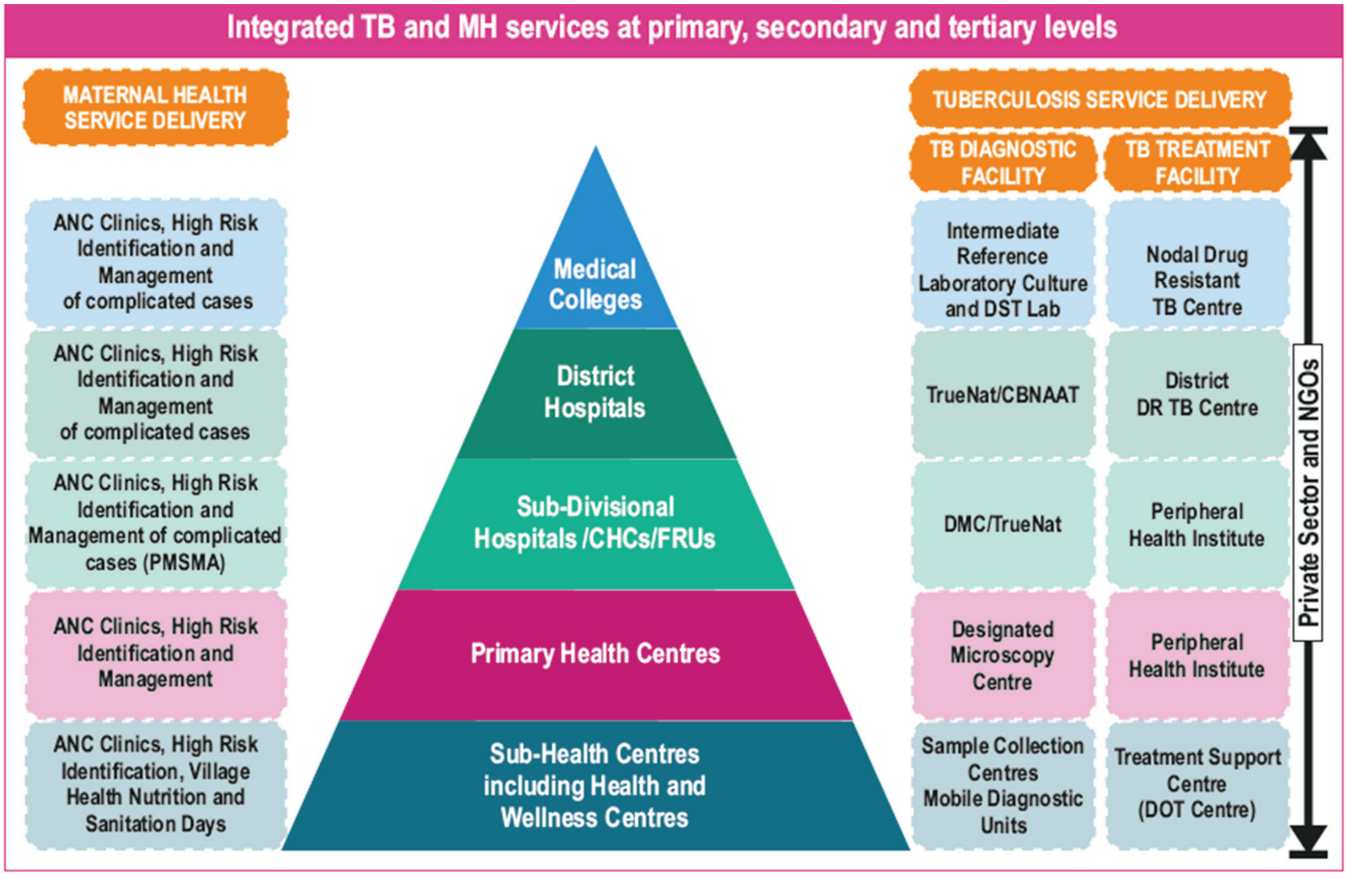
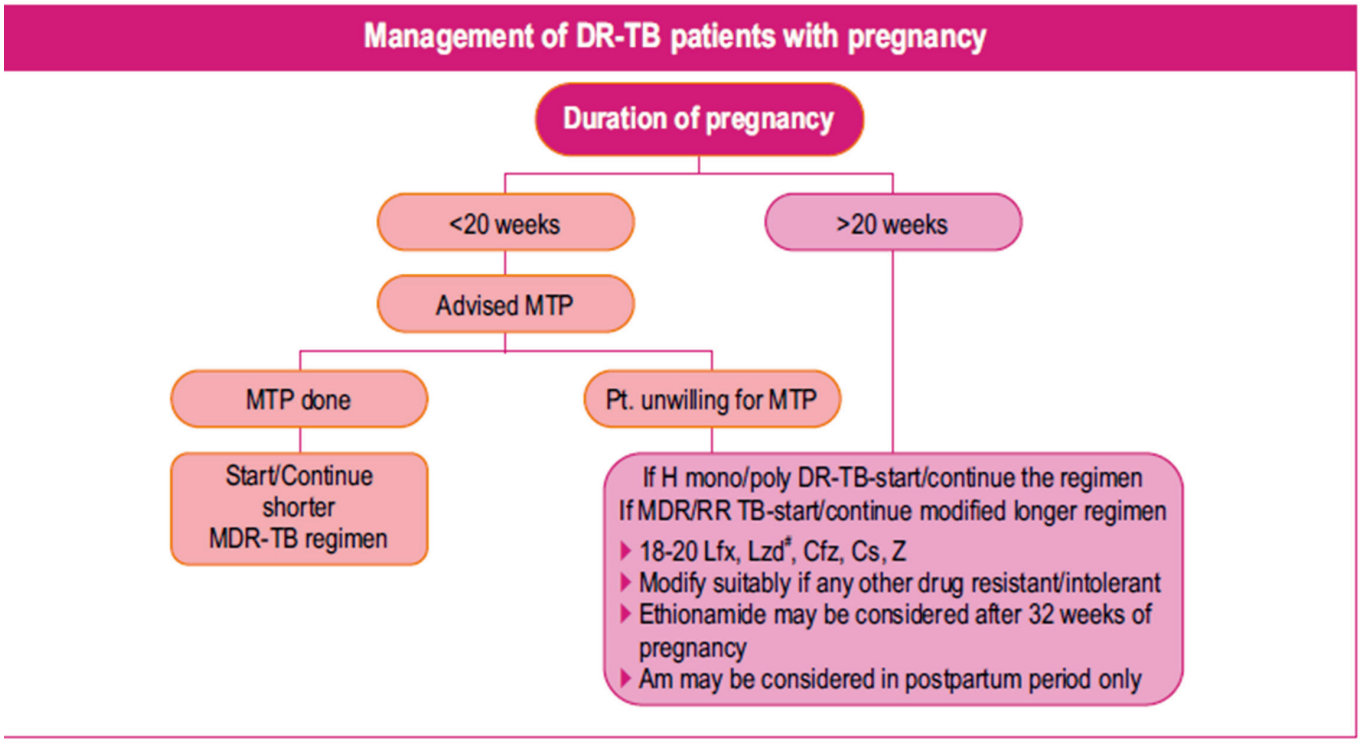


Fig V



Note: Please refer to PMDT Guidelines 2021 for management of DRTB in Pregnancy

Fig VI

and family welfare department of Government of India has worked too hard and achieved 10 % reduction in infection rate and mortality rate due to tuberculosis. The impact of pandemic COVID -19 on tuberculosis has been estimated by scientists and they have told that there is an 13 % increase in death rate due to tuberculosis in 2020. This may be due to 25 % reduction on notification rate, due to Shot down, Lock down, DOTS also suffered, the doctors of this sector are diverted to COVID hospitals and DR centers are converted to COVID hospitals. Tuberculosis is the top most infecticious killer of the world, corona just behind. Both are respiratory diseases having same symptoms, same risk factors and similar social predispositions. A metaanalysis showed that chronic respiratory disease cases can get two times infected with Corona -19. (Odd's Ratio- 2.46) Few studies showed, If a tuberculosis case is affected by Corona, the death rate is more. It also reactivates latent tuberculosis. The immunosuppressive drugs used in Covid-19 also reactivates tuberculosis cases. There are certain studies which shows that BCG vaccination gives certain protection to COVID-19 infected cases. The Ministry of health and family welfare, India have released an advisory on 26th August 2020 stating that prevalence of tuberculosis among COVID-19 patients is .37 % to 4.47 % and recommends bidirectional screening.

To conclude what one can write about the future of this type of a disease where everything is known, the causative organism is known, how it infects and spreads to other is known, the preventive measures are known, the drugs for treatment is available. Scientific knowledge is a continuously evolving process and recognizing how today's paradigms have been arrived at, is critical to understand how advances may be made in future. Mycobacterium tuberculosis bacteria is a tenacious organism. It has survived thousands of years and know how to avert its destruction. The only way it affects is through the air which is it's greatest asset. The world is no more indolent to the disease, every country has woken up to eradicate it, India has declared 'TB free India.' We all dream of a day, when the diagnosis becomes as easy as pregnancy wherever it is located, ultrashort course therapye so that it will increase the compliance and prevention becomes a reality.

Acknowledgement

I am especially indebted to Prof. S.N. Tripathy, Ex Prof. & Head of the Dept. of Chest & Tuberculosis for his help, guidance and positive criticism. I am grateful to the scientists, research workers, physicians, to the grassroot level workers who work day and night to uplift the lot of these unfortunate people.

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Protection of Children from Sexual Offences POCSO ACT: What we all should know

Ruchika Garg[1], Narendra Malhotra[2], Pavika Lal[3]

Introduction

Child Sexual Abuse (CSA) is an emerging grave public health concern, posing an enormous challenge worldwide with significant adverse impact on physical, mental & psychological wellbeing according to World Health Organisation.[1] Data is alarming and the scenario is too scary as prevalence rates of CSA varies from 8% to 31% for females and 3% to 17% for males globally.[2,3] Approximately 37% of India's population are children below 18years of age and around 53% of Indian children experience different forms of CSA.[4] Even the United Nations have urged the countries to "end abuse, exploitation, trafficking and all forms of violence against, and torture of, children", making it one of the targets of Sustainable Development Goals by 2030.

With this intention, the Government of India has implemented various child centric acts which are as follows:

- Commissions for protection of child rights act (CPCR)2005
- Protection of Children from Sexual Offences (POCSO) Act 2012
- Juvenile Justice Act (JJ Act) 2015for protection and promotion of child rights and ensuring the safety, security, dignity and well being of children.

POCSO Act, came into force with effect from 14 November, 2012 is an all inclusive and complete law that provides protection to children (<18 years) from the offences of sexual assault (penetrative/ non-penetrative/aggravated sexual assault), sexual harassment, pornography or abetment while safeguarding the interests of the child at every stage of the judicial process and by incorporating child-friendly mechanisms for reporting and recording of evidence, and speedy trial of offences through designated special courts.

"Aggravated" sexual assault: When the abused child is mentally ill or is committed by a person in a position of trust or authority vis-à-vis the child (family member, police officer, teacher, or doctor).

Key highlights of the act:

- Makes it necessary to report each and every case.
- It is the legal duty of the person who is aware of the offences to report them. If fails to do so, person

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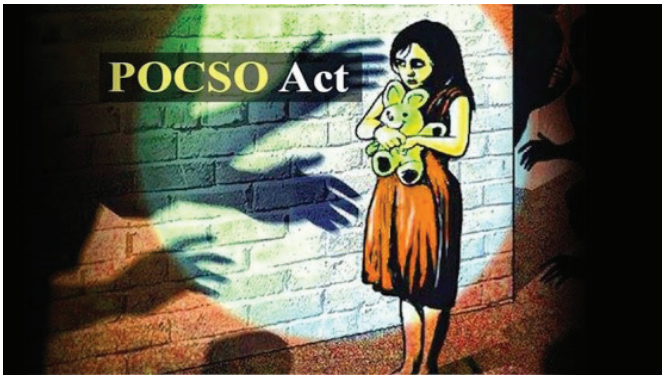


can be punished with 6 months of imprisonment and fine.

- Provides for punishment against false complaints or untrue information.
- Punishment is graded according to the gravity of offence.

Amendments made in 2019 to the POCSO Act, 2012

The POCSO Act was amended in order to make it more effective in dealing with cases of child sex abuse in the country which came into effect from 16 August, 2019.

- Modified to incorporate child pornography
- Punishment from a of minimum of 7 years was increased to 10 years and even 20 years if the victim is below 16 years for penetrative sexual assault
- Amended to include aggravated penetrative sexual assault during natural calamity and causing the death of child
- Punishment was increased from a minimum of 10 years to a minimum of 20years and introducing the death penalty as an option for penalizing for aggravated penetrative sexual assault
- A fine was introduced (Rs 5,000/- on the first occasion, Rs 10,000 on the second occasion) for punishment of storage of pornographic material and if it was used for commercial purposes, then the minimum punishment will be imprisonment for three years which may extend to five years or with fine or both. With subsequent conviction, imprisonment for a term not to be less than five years which may extend to seven years along with fine was instigated.
- It was amended to establish consonance with the JJ act 2015.
- Revised in order to acknowledge the amendment made vide Criminal Law Amendment Act,2018;

Salient features of POCSO rule 2020: CSA is one of the most crucial concerns of the day and therefore it is the responsibility of GOI to provide an environment propitious to the development, growth and to live with dignity for the children in accordance with the UN convention. Besides providing punishment under the POCSO act it also highlights the importance of various aspects to ensure child protection, safety and rehabilitation based on the principle of zero-tolerance to violence against children.[5]

1. Awareness generation and capacity building

The Central incoordination with State Government should prepare age-appropriate educational material and information for children, and awaring them about several features of personal safety, possible risks and vulnerabilities, signs of abuse, inculcating gender sensitivity, equality and equity for effective prevention of offences at all public and prominent places and also be disseminated in suitable form in virtual spaces such as social media.

Orientation programmes, and workshops should be organised for sensitising those who come in regular contact with children.

2. Procedure regarding care and protection of child

When Special Juvenile Police Unit (SJPU) or the local police receives any information with respect to an

offence that has been committed or attempted from any person including the child or child helpline-1098 the following details should always be mentioned

- name and designation;
- address and telephone number;
- name, designation and contact details of the officer who receives the information.
- Proceed to record and register a First Information Report as per the provisions of section154 of the Code of Criminal Procedure, 1973 and furnish a copy thereof free of cost to the person making such report.
- To take the child to the hospital for emergency medical care and to ensure that the samples collected for the purposes of the forensic tests are sent to the forensic laboratory immediately
- Inform the child and the parents of the availability and accessibility of support services and assist them in contacting the persons who are responsible for providing these services
- Provide them legal advice and counsel and the right to be represented by a lawyer.
- It is the due responsibility of the police to produce the child before the Child Welfare Committee (CWC) within 24 hours of receipt of such report if the police feels that the offence has been committed by a person living in the same household with the child.
- Concerned CWC must proceed, under JJ act to make a determination within three days, as to whether the child needs to be taken out of the custody of child's family or shared household and placed in a shelter home.
- CWC, may provide a person to render assistance and all possible help to the child throughout the process trial.

3. Interpreters, translators, special educators, experts and support persons.

- In each district, the DCPU shall maintain a register with names, addresses and contact details of the special personnel and should be made available to the official persons whenever necessary.

- Interpreters should have familiarity with language spoken by the child as well as the official language of the state.
- Sign language should be understood by such persons and they should have relevant qualifications from recognised university.
- These persons be unbiased and impartial and render a complete and valid interpretation without any additions or omissions, in accordance with Code of Criminal Procedure, 1973.

4. Medical aid and care

- SJPU, or the local police, within 24 hours of receiving such information, arrange to take such a child to the hospital for emergency medical care.
- No medical practitioner, shall demand any legal or magisterial requisition or other documentation as a pre-requisite to rendering such care.

Health professionals play an important role of providing 3Cs to the survivors:

- Compassionate (care and concern for whatever they have experienced)
- Competent (treatment should be appropriate)
- Confidential (privacy)

It is always important to establish a rapport with the survivor in the beginning:

- Never say or do anything to suggest disbelief regarding the incident.
- Do not pass judgemental remarks that might appear unsympathetic.

- Appreciate the survivor's strength in coming to the hospital as it can serve to build a bond of trust.

COMPONENTS OF CARE

FORENSIC CARE:

- Ensuring good quality, complete and non-judgemental documentation
- Conducting a forensic examination by completing a 'rape kit', which is a pre-assembled box of instructions and containers designed to ensure evidence collection, occurs in a standardized, ordered and thorough manner.
- Maintaining a clear and fool-proof chain of custody of medical evidence collected.

MEDICAL CARE:

- Antibiotics for treatment of STIs as per protocol (these infections include Chlamydia, Gonorrhea, HIV and Syphilis): give the shortest courses available.
- For post-exposure prophylaxis of HIV transmission: must be started as soon as possible within 72 hours of exposure with a recommendation of 28 days of course.
- Emergency contraceptive pills and/or copper bearing intrauterine devices within 5 days of unprotected intercourse will reduce the chance of a pregnancy by 56%-93%: Ulipristal 30mg PO once within 120 hrs.
- Tetanus: Tdap vaccine 0.5 ml IM and tetanus immunoglobulin 250 units IM.
- Hepatitis B vaccine: administer vaccine series and immunoglobulin within 24 hrs.

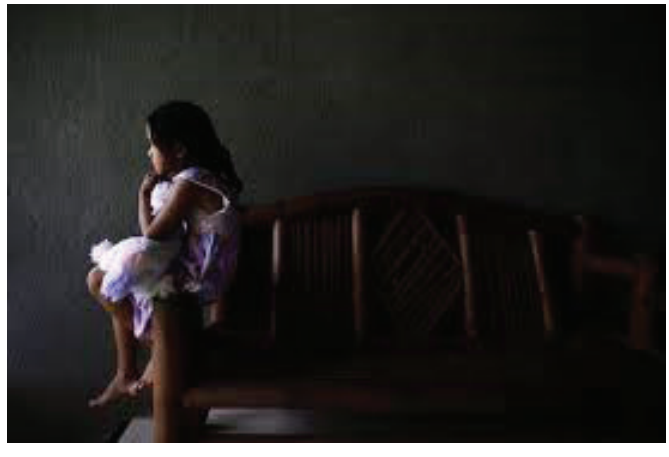
SURGICAL CARE:

- Victims may have scratches, cuts, bruises, and superficial wounds which should be cleaned and antibiotics may be given to prevent wound from becoming infected.
- Forced penetration especially in children may lead to perineal tears (including complete perineal tear) which should be dealt with multidisciplinary approach especially with the involvement of pediatric surgeon.

- If the child is found to be pregnant, then the registered medical practitioner shall counsel the child and her parents, regarding the various lawful options available to the child as per the Medical Termination of Pregnancy Act 2021 and the Juvenile Justice (Care and Protection of Children) Act 2015.
- If the child is found to have been administered any drugs or other intoxicating substances, access to drug dedication programme should be ensured.
- If the child is physically or mentally disabled, suitable measures and care shall be taken as per the provisions of The Rights of Persons with Disabilities Act, 2016.

PSYCHOLOGICAL CARE:

- Provision of safe and empathetic environment so that child feels comfortable to share their experiences.
- Active listening, allowing for personal expression of emotions (distress, fright, guilt, shame, anger, depressive and anxious affect) about events.
- Assessing familial and social consequences.



- Working on coping strategies.
- Working on acceptance and development of future perspectives and plans.

5. Legal aid and assistance.

The CWC shall make a recommendation to District Legal Services Authority (DLSA) for legal aid and assistance and shall be provided to the child in accordance with the provisions of the Legal Services Authorities Act, 1987.

6. Special relief.

- Special relief may be provided for contingencies such as food, clothes, transport and other essential needs and immediate payment shall be made within a week of receipt of recommendation from the CWC.

7. Compensation and imposition of fine and payment

- The Special Court may pass an order for interim compensation to meet the needs of the child for relief or rehabilitation.
- Under CrPC it shall take into account all relevant factors relating to the loss or injury caused to the victim, while awarding for compensation and includes the following: -
    - type of abuse, gravity of the offence and the severity of the mental or physical harm or injury suffered by the child;
    - the expenditure incurred or likely to be incurred on child's medical treatment
- Compensation should be paid by the State Government from the Victims Compensation Fund within 30 days of receipt of such order.
- The CWC should ensure payment of the compensation and any measures to facilitate it.

9. Reporting of pornographic material involving a child.

The Central and State Government should make all the desired efforts to create widespread awareness about the reporting of pornographic content (details of device, type of content and the platform which was used to display such content) from time to time and also take necessary actions as per the directions

10. Monitoring of implementation of the Act.

- The National Commission for the Protection of Child Rights (NCPCR) or the State Commission

for the Protection of Child Rights (SCPCR), under the Commissions for Protection of Child Rights Act, 2005 should perform the following functions for proper implementation of the Act -

- monitor the designation of Special Courts
- monitor the designing and implementation of modules for training police personnel
- monitor the dissemination of information through media and social network to increase the awareness.
- collect from the relevant agencies regarding reported cases of sexual abuse,

Drawback of the original act

The law does not highlight how the offender would be treated if he himself is a minor. Today, the physical and mental development of children has advanced much in comparison to earlier period and therefore, inappropriate to consider a child as adult only after he attains the age of 18 years. Hence, it would be pertinent if child offenders between 15 to 18 years of age is also punished under the same sections under which the punishment for adults have been described. It was decided in a parliamentary panel not to push age limit from 18 to 16 years for juveniles as existing laws are adequate enough to deal with the crimes committed in this age group.

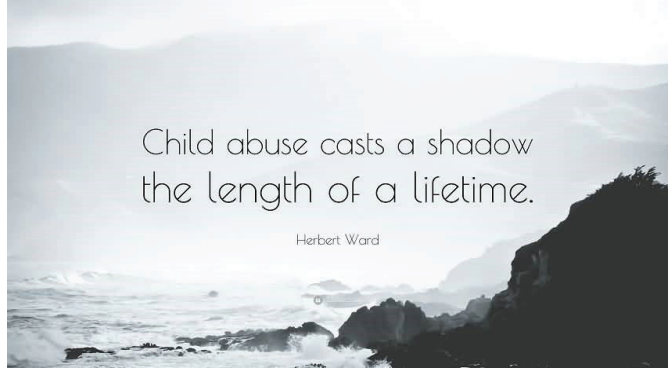
INTERPOL:[6]

- International Child Sexual Exploitation (ICSE) image and video database is an intelligence and investigative tool, which allows specialized investigators involving more than 64 countries to share data on cases of child sexual abuse.

- By analysing the digital, visual and audio content of photographs and videos, victim identification experts can retrieve clues, identify any overlap in cases and combine their efforts to locate victims of child sexual abuse.

CONCLUSION:

Protection of basic rights of children is of utmost concern. Measures in this regard are of paramount importance which ensures for proper and adequate implementation of legislative actions and community-based interventions through virtual media to prevent a further rise in the statistics and to ensure child protection.



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Original Article: Obstetrics

Retrospective Analytical Study on Indications of Primary Caesarean Section in a Tertiary Health Facility

Nupur Nandi Maiti[1], Abhijit Halder[2], Arijit Debnath[2], Anindita Jana[3]

Abstract

Background: Caesarean delivery is defined as the birth of a fetus through incision in the abdominal and uterine wall. Caesarean section can be life saving or can prevent serious morbidity to mother and fetus. Globally rapid increase of this mode of delivery has become the most debated topic in modern obstetric care. The World Health Organization (WHO) recommended that the average C-section birth rate should be 10% to15% while unnecessary C-section may impose detrimental effect on maternal and perinatal outcome.

Aims and Objective: To analyze the indications of primary caesarean section along with their obstetric determinants.

Secondary objective: To identify the factors needed to be addressed for the development of strategies to reduce primary C-Section rates for improved maternal and child health care.

Materials and Methods: This hospital-based retrospective study was conducted at College of Medicine and JNM Hospital, WBUHS, Kalyani upon all patients undergoing primary caesarean section at the facility from June 2021 to May 2022.

Results: A total of 1716 primary caesarean sections were done in the said period of which 505 cases were elective and 1211 cases were emergency. The percentage of primigravida women was significantly higher in emergency group (82%) than elective ones (64%). The most common indication of all caesarean sections being presumed fetal distress (31.9%) followed by failed induction (22.2%).

Conclusion: Caesarean section is considered as a process indicator in maternal health. Majority of the indication being presumed fetal distress, improved set up to support and revive sick neonates, and lesser fear of litigation may reduce the rate of primary

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caesarean section. The government should also develop better health-care infrastructure and caesarean audit strategies to decrease the rising trend of caesarean section.

Keywords: Primary caesarean section, indications, elective, emergency.

Introduction

Caesarean section is the most common obstetric surgery performed to save the mother and or child for reducing the maternal and perinatal mortality. The rapid increase of global caesarean rate has become the most debated topic in modern obstetric care.[1,2] The World Health Organization (WHO) recommended that the population based C-section rate should be 5% to 15% to have an optimal impact.[3] Unnecessary C-section may impose detrimental effect on maternal and perinatal outcome with inadvertent increase in maternal and neonatal mortality and morbidity.[4,5] Delivery by C-section can cause significant and sometimes permanent complications, disability or death particularly in a setting that lack capacity to conduct safe surgery.[6] Previous caesarean delivery increases chance of caesarean delivery in current pregnancy. This necessitates evaluating the indications of primary caesarean delivery with an aim to analyze the feasibility of reduction in the caesarean section rate without increased maternal or perinatal morbidity or mortality rates.

Aims and objective:

To evaluate the indications of primary caesarean section along with their obstetric determinants.

Secondary objective: To identify the factors needed to be addressed for the development of strategies to reduce primary C-Section rates for improved maternal and child health care.

Materials and Methods

This hospital-based retrospective study was conducted at College of Medicine and JNM Hospital, WBUHS, Kalyani upon all patients undergone primary caesarean section at the facility. Last 12 months CS Audit excel sheets of the institute was collected and analyzed. Patients with previous caesarean sections were excluded from the study. A total of 1716 women with primary caesarean sections were found from June 2021 to May 2022.

Samples selected taking into account all primary C-sections done with exclusion of cases with previous C-sections.

Case sheets were studied thoroughly to extract the following data;

a) Obstetric History

b) Interval between decision for caesarean and delivery time, to determine whether it was elective or emergency.

c) Indications of C-section

Monthly data put on a new excel sheet and annual data calculated from it.

Data analyzed and outcome measured with statistical analysis using SPSS 20 version. Only first cesarean delivery cases were taken into consideration. Elective caesarean section was defined as those performed without emergencies, and the decision was made before the onset of labour. Emergency caesareans were defined as those performed for maternal or fetal emergencies.

Results

In this study amongst total 1716 primary caesarean deliveries, more than two third of the women (n=1211) undergone emergency caesarean sections (70.6%), while 505 patients undergone elective caesarean sections (29.4%).

Among all patients undergoing elective caesarean sections, 64% patients were primigravida and 20% patients had history of previous abortions.

Among the patients undergoing emergency caesarean sections, 82% patients were primigravida.

Table 1: Indications of primary caesarean section

Sl No according to frequency	Indication	Number (N=1716)	Percentage
1	Presumed fetal distress incluing abnormal CTG	649	31.9%
2	Induction failure	391	22.2%
3	Severe pre-eclampsia/ impending eclampsia	183	10.6%

Sl No according to frequency	Indication	Number (N=1716)	Percentage
4	Breech	84	4.9%
5	CPD	68	3.9%
6	IUGR	61	3.5%
7	Multifetal pregnancy	45	2.6%
8	Post-term pregnancy	45	2.6%
9	Gross Oligohydramnios	44	2.5%
10	Placenta previa	41	2.3%
11	Premature rupture of membrane	33	1.9%
12	Obstructed labour	30	1.7%
13	Abruption	20	1.1%
14	Unstable/transverse/oblique lie	16	0.9%
15	Cord prolapse	6	0.3%

Presumed fetal distress being the most common indication of primary caesarean deliveries (31.9%), followed by failure of induction (22.2%). Severe pre-eclampsia/impending eclampsia also posed a significant cause (10.6%).

Discussion

In a study by Saraya Y S. et al showed that the most common indication for primary C- section was fetal distress (27.5%), followed by non-progress of labour (22.5%), breech (18%).[7]

Study by Singh N. et al described that the percentage of primigravida was higher (77%) in emergency C-sections and percentage of multigravida was higher (60%) in elective c-sections. The main indications for emergency C-sections were fetal distress (62%).[8] In our study primigravida cases were 82% considering emergency C-section.

Dorji T. et al in their study among 10,919 C-sections showed the rate of elective and emergency C-sections were 41.2% and 58.8% respectively. The most common indications (excluding post-caesarean cases) were fetal distress and non-reassuring CTG (14.3%). Other indications were non-progress of labour (13.2%), CPD (12%), oligohydramnios (9%), malpresentation including breech (8.8%), induction failure (8.7%), FGR (5.7%), pre -eclampsia/eclampsia/hypertension (4.6%).[9]

Concomitant with all the above mentioned studies, in current study presumed fetal distress including abnormal CTG is the most frequent indication (31.9%) for primary C-section. This is also supported by Pravina P. et al in their study which showed among 812 c-sections, the major indications (excluding post cesarean cases) were fetal distress 31.15%.10

In a multicentric (39 hospitals) study by Liu Y et al on a huge number of study subjects (111,315), showed that overall C-section rate in mainland China is 54.90 %. Very high C-section rate attributed to the commonest indication of all as maternal request, 28.43%. The next common indication as CPD (14.0%), followed by fetal distress 12.46%.11

Table 2: Share of fetal distress as an indication of caesarean section in different studies

Study By	Year	Percentage of fetal distress as indication of C-section
Saraya YS et al	2019	27.5%
Singh N et al	2020	62%
Dorji T et al	2021	14.3%
Pravina P et al	2022	31.15%
Present Study	2022	31.9%

In our study presumed fetal distress also included cases with abnormal CTG. As this particular indication constitute almost about one third of all C-section deliveries, proper analysis should be done using other methods like scalp blood pH to exclude over diagnosis.

Robson MS stratifies women undergoing C-section according to their obstetric characteristics.12 In 2011, WHO conducted a systemic review of methods used to classify C-section and concluded that Robson's classification is the most appropriate system.13Application of Robson's classification may bring uniformity in decision taking for the conduction of caesarean birth.

Conclusion

Caesarean section is considered as a process indicator in maternal and child health. There is a tremendous increase in caesarean rate globally. This causes burden to the general health system and may complicate maternal and child health. Reducing primary C-section automatically decreases future caesarean delivery, which ultimately results less number of total C-section. Abnormal CTG features should be evaluated by other means to support or refute fetal distress. Obstetricians should cautiously take decision regarding primary C-section delivery and every effort should be made to provide C-sections to women in need, rather than striving to achieve a specific rate.

The government should also develop better health-care infrastructure and caesarean audit strategies to decrease preventable maternal as well as perinatal mortality.

Limitations of the study

a) Being a tertiary care centre, most of the patients undergoing caesarean sections in our institute were referred in cases. Hence, the result obtained could not be generalized to the overall population of West Bengal.

b) Because of retrospective study design using existing records, some relevant information may be missing, resulting in information bias.

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Original Article: Obstetrics

Correlation of Fetal Outcome with Non-Stress Test in High Risk Pregnancy

Neha Singh[1], Kirti Anima Kerketta[2], Kumari Archana[3]

Abstract

Aim: To evaluate the efficacy of non-stress test in a high risk pregnancy for fetal outcome and establishing it as an easy, non-invasive technique for antepartum fetal surveillance.

Methods: 155 females booked or unbooked with more than 34 weeks of period of gestation with high risk pregnancies were included with written informed consent.

Result: Non-Stress test has sensitivity of 72%, specificity of 98%, positive predictive value came out to be 95% while negative predictive value of 85.5% in high risk pregnancies after 34 weeks of gestation.

Conclusion: NST is a valuable screening test for detecting fetal compromise in pregnancies that have a poor perinatal outcome. Though rate of operative delivery was high, fetal death rate was lower in population undergoing antepartum testing as compared to general untested population.

Keywords: NST, High risk pregnancy, fetal heart rate, fetal wellbeing.

Introduction:

Women with high risk pregnancy are at risk of delivering an asphyxiated new born which may result from abnormality in the fetal gas exchange leading to hypoxia and acidosis.[1] With timely detection of changes in fetal status and appropriate intervention can prevent perinatal mortality and morbidity. Non Stress Test (NST) is being extensively used in the cases of high risk pregnancies because of its advantage of being simple, non-invasive, and can be repeated easily.[2,3,4,5] Gestational age influences acceleration or reactivity of heart rate through autonomic nervous system.[6] NST involves the use of Doppler detected foetal heart rate acceleration coincident with foetal movements perceived by the mother. The basis of NST is the absence of fetal heart acceleration with fetal movements is associated with fetal hypoxemia.[7] The present study is to evaluate the role of non-stress test in a high risk pregnancy for fetal outcome, with

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the objective to see if an abnormal Non-Stress test can be used to predict adverse perinatal outcome and to see if Non-Stress test can adequately detect fetal distress at an early stage and thus help in decision making.

Aim and Objective:

1. To evaluate the role of non-stress test, a screening method in management of high risk pregnancies admitted in labor room
2. To study the correlation of non-stress test with fetal outcome
3. To assess the positive and negative predictive value of non-stress test.

Matrerial and Methods

The present study was performed at Bokaro General Hospital, Bokaro Steel City, Jharkhand, India, with approval from the ethical committee. The written informed consent was taken from all the 155 participants with high risk pregnancy after 34 weeks of gestation.

Inclusion criteria-

- Gestational hypertension, IUGR, Pre eclampsia, Anemia, Less fetal movement, Gestational diabetes Postdated pregnancy, Bad obstetric history, Oligohydraminos, polyhydraminos, Antepartum hemorrhage Heart disease, ART/precious pregnancy, Thyroid in pregnancy, IHC, Elderly primi, Teenage pregnancy Rh incompatibility

Exclusion criteria-

- Pregnant women with gestational age <34 weeks or in labor, Eclampsia, Multiple gestation, Fetal congenital anomalies, Intrauterine fetal death

Methodology:

All the females booked or unbooked with more than 34 weeks of period of gestation attending OPD or IPD and fulfilling the criteria will be explained about the test. Tocodyanometer Measures uterine contractions, placed at fundus of uterus without jelly. USB probe measures baby's heartbeat applied with jelly at site where maximum fetal heart sound is heard. When the mother feels the baby kick or move, she presses a button on the event marker probe so we can see how the baby's heartbeat changed while moving. The test will take about 20 minutes. The whole event is depicted over screen and is graphed over a specialized paper by printer for permanent record.

Parameter of Evaluation:

	Reassuring	Non-reassuring
Baseline fetal heart rate	110-160	Less than 100 More than 160
Beat to beat variability	>5 beats in 20 min	<5 beats in 40-90 min
Acceleration	>2	<2
Deceleration	No deceleration Early deceleration	Variable deceleration Late deceleration
Fetal movement	Present	Absent

Result:

A total of 155 high risk pregnant women after 34 weeks of gestation were studied. The mean age was 27.9 + 4.4 years. The mean gestational age was 39.43 ± 2.34 weeks.

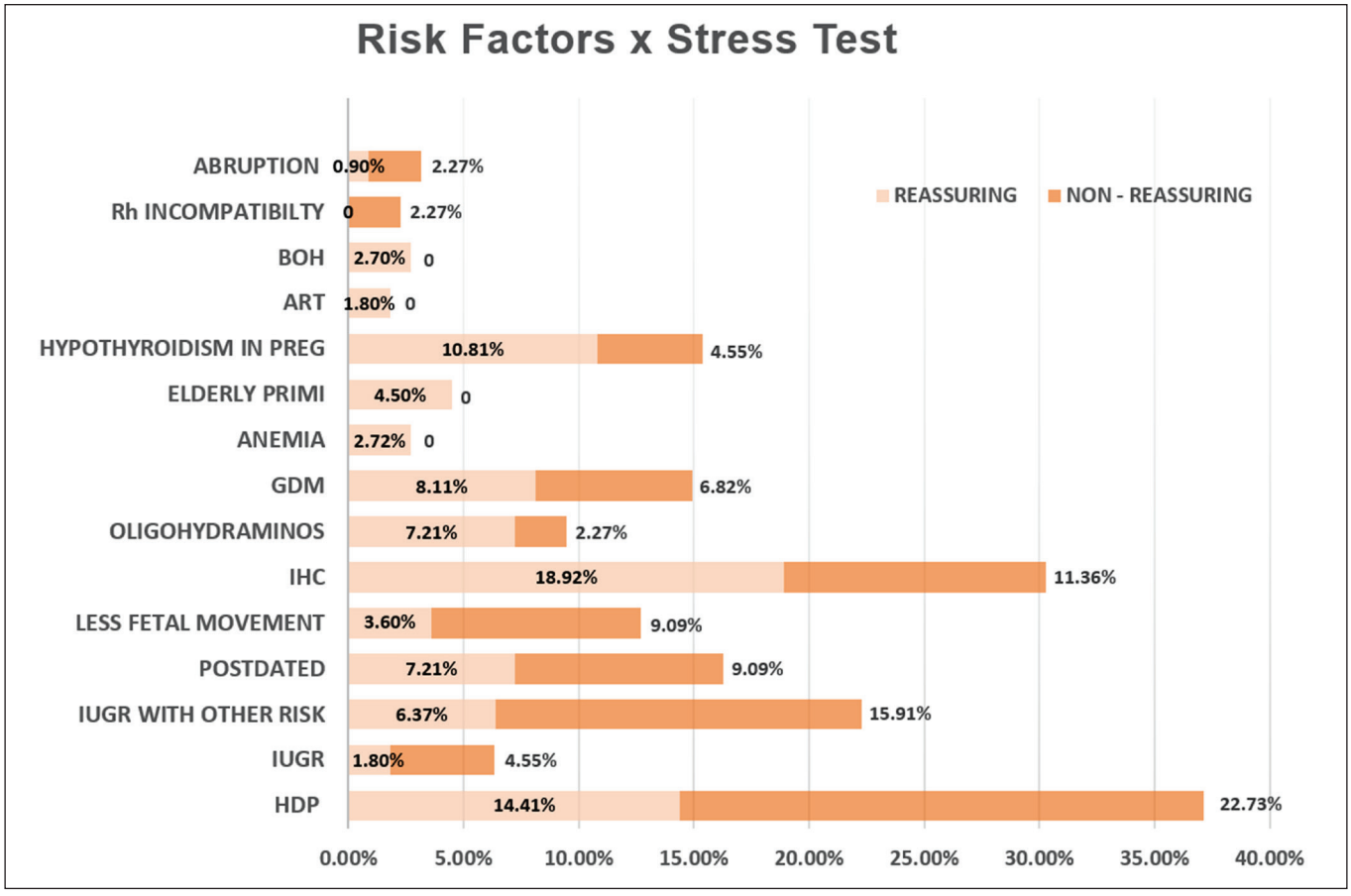
Maximum subjects among study group were primigravida 90 (58.06%). 133 (85.8%) were booked while 22 (14.2%) attended emergency.

Among all the subjects, 109 subjects with single high risk factor, 20% had non-reassuring NST while out of 46 subjects with multiple high risk factors, 47.8 % had non-reassuring NST suggesting abnormal NST increases with an increase in the number of high-risk factors.

Table 1: Correlation Of Number Of High Risk Factors With Result Of Non-Stress Test

	Reassuring NST	Non Reassuring NST	Total
Single High Risk Factor	87 (80%)	22 (20%)	109 (100%)
Multiple High Risk Factors	24 (52.17%)	22 (47.8%)	46 (100%)

Out of 155 subjects, 111(72%) had reassuring NST and 44 (28%) had non-reassuring Non-Stress test. Most common risk factor associated with non-reassuring NST was hypertensive disorders of pregnancy (22.7%) followed by IUGR with and without associated risk (20.5%) and IHC (11.36%), postdated pregnancy and subjects presenting with less fetal movement were 9% each. GDM (6.82%), hypothyroidism (4.5%), abruption placentae (2.2%) and Rh incompatibility (2.2%) respectively.



Graph 1: CORRELATION OF HIGH RISK FACTORS WITH RESULT OF NST

Among 133 subjects with booked status, 98(74%) had reassuring NST result while 35 (26%) had non-reassuring NST findings. Out of 22 subjects with unbooked status, 13 (59%) had reassuring Non-Stress test result while 9 (41%) had non–reassuring NST findings. On comparing Non-Stress test findings according to booking status, statistical significant association ($p<0.05$) was observed between NST results and booking status indicating higher reassuring results in booked subjects.

About 98% women underwent LSCS and only 2% were delivered vaginally among non-reassuring group. However, 25% of reassuring group were delivered vaginally and 75% underwent LSCS. Statistical significant difference ($p<0.05$) was observed in relation to different modes of delivery in non-reassuring NST group. Rate of LSCS was 98% and vaginal delivery was (2%)

Table 2: CORRELATION OF MODE OF DELIVERY WITH RESULT OF NON- STRESS TEST

Mode of Delivery	Reassuring (n=111)		Non Reassuring (n=44)	
	Frequency	%	Frequency	%
Vaginal Delivery	28	25%	1	2%
LSCS	83	75%	43	98%
Total	111	100%	44	100%
Chi square test = 14.65, p =0.015* (statistical significant difference)				

Most common indication of LSCS among non-reassuring group was fetal distress accounting for 44.1% followed by failed IOL (32.5%) and severe preeclampsia (13.9%) while in reassuring group, most common indication for lscs was failed IOL was 36.1% where induction was done for associated high risk and fetal distress occurred in 10.8%,. Severe preeclampsia accounted for 12%.

2.32% subjects with meconium stained liquor had non-reassuring NST where as 2.4% showed reassuring NST.

Table 3: CORRELATION OF COLOR DOPPLER RESULT WITH NON-STRESS TEST

Doppler	Reassuring NST	Non Reassuring NST
Normal Doppler	97 (87%)	34 (77%)
Abnormal Doppler	14 (13%)	10 (23%)
Total	111 (100%)	44 (100%)

Table 4: MEAN AMNIOTIC FLUID INDEX AMONG STUDY GROUP

	Reassuring Mean (SD)	Non Reassuring Mean (SD)	Unpaired 't' test	p value, Significance
AFI	11.36 (2.36)	10.37 (2.41)	t = 2.264	p =0.025*

Mean amniotic fluid index was 11.36 cm in reassuring group while it was 10.37 cm in non-reassuring group. Significant association was found between non-stress result and amniotic fluid index. (p<0.025)

Neonatal outcome was correlated with result of NST in terms of APGAR at 5 min, NICU admissions, birthweight and meconium staining. All neonates of reassuring group had Apgar score >7 at 5 min while in subjects with non-reassuring NST, 6 (14%) neonates had Apgar score <7 and 38(86%) had APGAR >7 at 5 min.

On correlating birth weight of neonates for gestational age with non-stress test results, there was highly statistical significant association (p<0.001) obtained with SGA having high proportion (45%) of NR NST while LGA had only 2.5% of NR NST. In the study of 111 subjects who belonged to reassuring NST group, 67% were appropriate for gestational age, 16% were small for gestational age (SGA) and 17% were large for gestational age (LGA) whereas among 44 subjects with non-reassuring NST, small size for gestational age (SGA) were 41%, Appropriate for gestational age (AGA) 48%, LGA -11%.19% neonates in reassuring Non-Stress test group required NICU admission while 45% neonates in non-reassuring NST were admitted in NICU. Meconium stained liquor was observed in 6% reassuring Non-Stress test and 39% in non-reassuring NST group. Still births were not reported in either group. Meconium stained liquor was seen in 17 neonates. 6 neonates had Apgar <7 at 5 min and fetal distress was found in 19 subjects in non-reassuring NST group. There were 7neonates with meconium staining in reassuring group who had fetal distress. No still birth in both the groups.

Table 5: PERFORMANCE OF NON-STRESS TEST WITH END RESULT

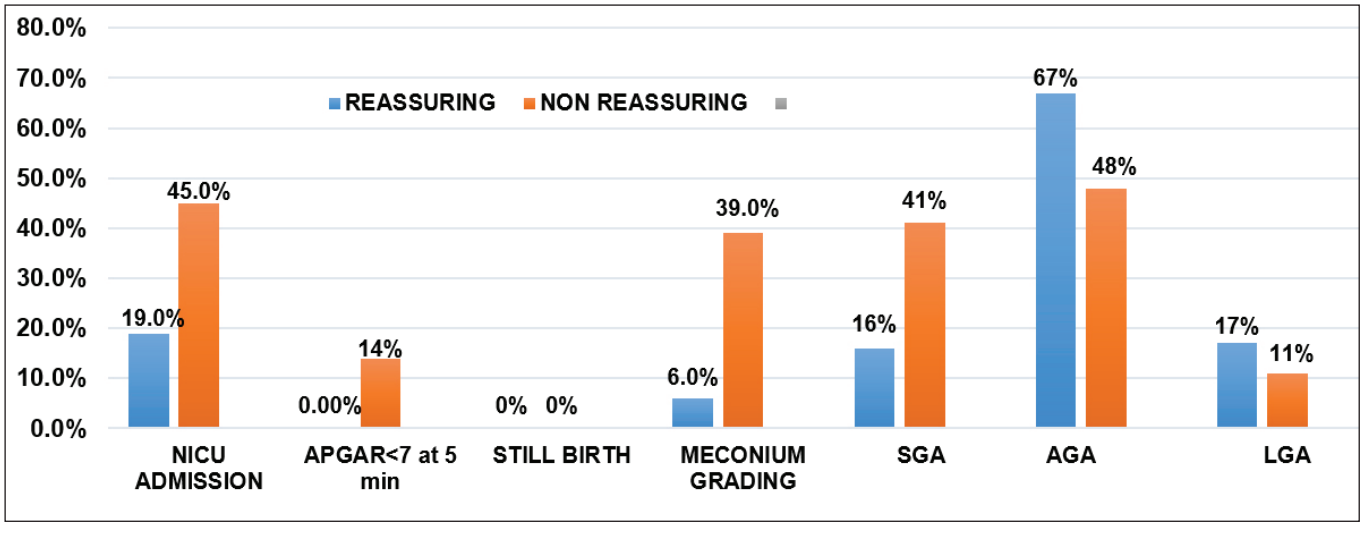
	Sensitivity	Specificity	PPV	NPV
Result of NST	72%	98%	95%	85.5%

Performance of Non-Stress test was correlated with fetal outcome. The study showed Non-Stress test has sensitivity of 72%, specificity of 98%.

The positive predictive value came out to be 95% while negative predictive value of 85.5% Hence, non-stress test can be used as a screening test to identify fetal distress so that early intervention and mode of delivery can be planned.

Discussion:

Antenatal fetal monitoring is a field of emerging importance as still birth still accounts for majority of perinatal mortality. Hence identifying fetuses requiring intervention to prevent death or damage and allowing healthy fetuses go to term there is need of



Graph 2: CORRELATION OF NEONATAL OUTCOME WITH END RESULT OF NON- STRESS TEST

fetal surveillance method that is noninvasive, accurate and yield immediate results

This study suggests that presence of multiple high risk factor was associated with non-reassuring NST was also seen in study done by Patange RP et al, where 50% abnormal Non-Stress test was seen in subjects with 3 high risk factors and 10% in group with only 1 high risk factor.

Most prevalent high risk factor with highest percentage of non-reassuring NST was seen in gestational hypertension and pre-eclampsia (hypertensive disorders of pregnancy 23%) followed by IUGR and IUGR associated with other risk factor (20.5%). Subjects presenting with less fetal movement (5%) and postdated pregnancy were 8%. Most common high risk factor in the study by Patange RP et al was overdue pregnancy (60.6%), which was only 8% in present study. This may be attributed to high number of booked cases who were regularly followed up and was planned for delivery by 40 weeks of gestation. Study of Bhutiyani A et al showed PETas second most common high risk factor (18%) and gestational hypertension accounted (n=2) 4.3% while in our study it is 23%, included in hypertensive disorders of pregnancy.

In this study, statistical significant association ($p<0.05$) was observed between stress test results and booking status indicating higher reassuring results in booked subjects. Common mode of delivery among 44 subjects with non-reassuring NST was LSCS, 43(98%). Only 1(2%) was delivered vaginally and most common indication of LSCS among Non- reassuring NST was fetal distress (44.1%) followed by failed induction of labor (32.5%). Similar to study of Singh S et al, 90% subjects with non-reactive NST underwent LSCS and most common indication was fetal distress, while 10% delivered vaginally. In study of Himabindu P et al, 46% underwent LSCS and most common indication was failed IOL (12%) followed by fetal distress (11%). In reassuring group of present study, 25% were delivered vaginally while 75% underwent LSCS. In study of Singh S et al, 76.7% of antenatal women delivered vaginally and 23.3% of antenatal women delivered with caesarean section in reactive NST group. Most common indication of LSCS in this group was failed IOL (36.1%), IOL done for associated high risk factors. As NST is not a substitute to clinical judgment, all subjects in this study were further evaluated with ultrasonography for amniotic fluid level and umbilical artery color Doppler.

Among 40 subjects with non-reassuring NST, 10 (25%) had abnormal color Doppler study while 30(75%) had normal color Doppler result. Among reassuring NST group (111), 14(13%) had abnormal Doppler result which was consistent with study conducted by Verma U et al and WJ Ott who concluded that color Doppler in association with NST improves the sensitivity and specificity to detect fetal hypoxia and distress.[15,16]

Mean amniotic fluid distribution among study group with non- reassuring NST 10.5cm and reassuring NST group had 11.5 cm as mean AFI. There was clinical significance suggesting liquor can affect the fetal condition. In study of Bhutiyani A et al, 10.9% had low liquor in non- reactive group where as 6.5% had low liquor in reactive group and found that Non-Stress test have very highly significant association with quantity of liquor in high risk group as compared to low risk group.

On comparing neonatal birth weight among the two groups, 18(45%) out of 44 were below 2.5 kg which was comparable with studies of Bhutiyani A et al where, 33.3% neonates in high-risk group with non-reassuring NST were below 2.5kg birth weight. In study by Lohana et al, 12 babies were below 2.5kg birth weight, of which 41.67% belonged to non-reassuring NST group.[17] In a study by Bano I et al, 31.8% of the babies with reactive NST had low birth weight where as in this study only 16% were below 2.5 kg in reassuring group.[18]

As long term neurological correlation is obtained with 5 min Apgar score hence it is included in this study. Among neonates of non-reassuring NST group in this study, 15% had Apgar <7 at 5 min where as 85% of neonates had Apgar >7 at 5min. Among the reassuring NST group none had Apgar <7 at 5 min as in study conducted by Lohana et al, non-reactive group had 60% neonates with low Apgar scores, 40% had good Apgar score at 5 min i.e. >7. Overall incidence of good Apgar may be observed due good neonatal resuscitation efforts between 1 min and 5 min. Also operative intervention may be attributed to good neonatal Apgar.

On comparison, 49% of neonate required NICU admission among non-reassuring group where as 51% of neonates admitted in NICU among reassuring NST group. This is due to NICU admission for observation in neonates born to high risk mothers like GDM, preterm deliveries and SGA babies. In a study by Bano I et al, 3.6% of the pregnant mothers with reactive NST required NICU admission, whereas 28.5% of the fetus born to pregnant mothers with non-reactive strip required NICU admission. In a study by Lohana et al, 13 babies were shifted to NICU, 69.23% babies had non-reactive strip.

Meconium stained liquor was seen in 64% in non-reassuring NST group and 36% in reassuring group which is comparable to study conducted by Lohana et al, which had meconium stained liquor in 33.33% of non-reactive NST compared to 8.24% of reactive NST. There was no still birth in either group. This may be attributed to early recognition of distress and timely intervention as seen with study of Kelly and Kulkarni who estimated a 44% potential saving among monitoring.[19] Bano I et al also had no perinatal mortality.[18]

Correlation of neonatal outcome with result Non-Stress test took into account 4 factors. Meconium staining of liquor was seen in 17 neonates, Apgar <7 at 5 min was seen in 6 and 19 had fetal distress.

Performance of non-stress test was evaluated which showed sensitivity of 72%, specificity of 98%, PPV came out to be 95% and NPV was 85.5%. Similar study was done by Munshi D et al and concluded sensitivity of 71.4%, specificity of 98%, PPV 60%, NPV 77%. This suggests that when NST is nonreactive, early delivery by either vaginal or caesarean route is indicated. Thus NST results can help in early decision making to achieve optimal maternal and fetal outcome.

The use of NST in monitoring high risk pregnancies may result in an increase in the incidence of operative delivery as seen in our study but it can be effectively used in high risk pregnancies because a reactive NST, can reliably identify a healthy fetus and an abnormal (non-reactive) NST should alert the clinician to consider the possibility of fetal compromise and has to be followed up by other adjunctive tests (Biophysical profile, color Doppler) to help further improve obstetric outcome.

Conclusion:

Non-Stress test can be used as an effective screening method to identify high risk fetuses and segregate the population that is at risk of perinatal mortality and morbidity. Reactive NST is reassuring and indicates fetal wellbeing and non-reactive NST along with other modalities like BPP and color Doppler can be used to identify high risk fetuses. The potential advantage of NST is that, it identifies fetuses at risk and hence early intervention and mode of delivery can be planned. In conclusion, NST is a valuable screening test for detecting fetal compromise in pregnancies that have a poor perinatal outcome. Though rate of operative delivery was high, fetal death rate was lower in population undergoing antepartum testing as compared to general untested population. In cases of non-reactive non-stress tests by proper planning and prompt decision to deliver we could save many babies.

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Original Article: Obstetrics

Inter-Pregnancy Interval Effect on Preeclampsia Recurrence

Anjana Sinha[1], Punit Hans[2]

Introduction

Interpregnancy interval defined as the period between delivery of the previous infant and conception of the current pregnancy[1] has been shown to influence fetomaternal outcomes in many earlier studies.[2] Maternal compli cations associated with short interpregnancy interval include increased risk of operative deliveries, anaemia, uterine rupture, placenta abruptio, placenta praevia and puerperal sepsis[3] while fetal complications include intrauterine growth restriction, prematurity, low birthweight, and neonatal jaundice. Various direct and indirect factors that have been noted to contribute to high prevalence of short interpregnancy interval especially in developing countries include desires for male child due to certain cultural recognition like land allocation and the belief that it is only the male child that immortalizes the family lineage. Other factors that contribute to SIPI include poor educational background, poverty, advance maternal age and poor utilization of family planning services.[4]

Pre-eclampsia (PE) is a multisystem disorder that typically affects 2%–5% of pregnant women and is one of the leading causes of maternal and perinatal morbidity and mortality, especially when the condition is of early onset.[5] Preeclampsia and eclampsia account for greater than 50,000 maternal deaths yearly worldwide. Like hypertensive disorders, the incidence of preeclampsia is correlated to ethnicity and race, most prevalent among African-American and Hispanic patients, making up around 26% of maternal death among this population.[6]

There are several risk factors and predeterminants of preeclampsia. These include nulliparity, multi-gestation pregnancy, advanced maternal age greater than 35 years old, in-vitro fertilization or other forms of assisted reproductive technology, maternal comorbidities (chronic hypertension, chronic kidney disease, diabetes mellitus, thrombophilia, obstructive sleep apnea, obesity with pre-pregnancy BMI greater than 30), family history, history of placental abruption or preeclampsia in a previous pregnancy, or intrauterine fetal growth restriction.[6,7,8] Women with a history of pre-eclampsia have a higher risk of developing pre-eclampsia in subsequent pregnancies.[9–11] This risk of recurrent pre-eclampsia varies from 7 to 65 % depending on factors such as gestational age at the onset or delivery of the initial pregnancy, severity of the disease and women's pre-existing medical disorders.[11] The relationship between birth interval and maternal and perinatal outcomes has been studied extensively.[12,13] Short inter-pregnancy intervals (< 18 months) may be associated with adverse pregnancy outcomes due to depletion of maternal nutrients and to the failure to treat existing comorbidities.[14,15] Whereas longer inter-pregnancy intervals might allow more complete recovery of the mother, they are associated with reduced fertility, older age, maternal disorders and partner change that

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are also linked with higher risk of pre-eclampsia.[16] This study was conducted to explore the effect of inter-pregnancy interval on the risk of recurrent preeclampsia or eclampsia.

Material and Methods:

Study design and participants: This is a observational prospective study to know the effect of inter-pregnancy interval on recurrence of preeclampsia and eclampsia conducted in the department of Obstetrics and Gynecology at a tertiary health centre. Study period was from first of March 2018 to 31st of january 2022. Patients admitted in Labor room emergency with second pregnancy onwards and history of preeclampsia in previous pregnancy were included in the study. The sample size was calculated from the formula $n=Z^2 P(1-2 P)/d^2$ using the prevalence of preeclampsia from a previous study[17] making total number of cases > 800 during the study period.

Data sources and management: All the records of patients included in the study were reviewed. Primi patients, patients with no prior history of preeclampsia, patients with gestational age < 20 weeks, cases with incomplete records and other co-morbidities like diabetes, immunocompromised health, heart disease and other severe medical illness were excluded from the study.

Definitions and Measurements: WHO technical report recommendation of normal interpregnancy interval (NIPI) of 24 months and short interpregnancy interval (SIPI) of less than 24 months was used in this study.

The study adopted the definition of Preeclampsia as proposed by the International Society for the Study of Hypertension in Pregnancy (ISSHP). According to the ISSHP, Preeclampsia is defined as systolic blood pressure at ≥140 mm Hg and/or diastolic blood pressure at ≥90 mm Hg on at least two occasions measured 4 hours apart in previously normotensive women and is accompanied by one or more of the following new-onset conditions at or after 20 weeks of gestation: 1. Proteinuria (i.e. ≥30 mg/mol protein : creatinine ratio; ≥300 mg/24 hour; or ≥2 + dipstick); 2. Evidence of other maternal organ dysfunction, including: acute kidney injury (creatinine ≥90 μmol/L; 1 mg/dL); liver involvement (elevated transaminases, e.g. alanine aminotransferase or aspartate aminotransferase >40 IU/L) with or without right upper quadrant or epigastric abdominal pain; neurological complications (e.g. eclampsia, altered mental status, blindness, stroke, clonus, severe headaches, and persistent visual scotomata); or hematological complications (thrombocytopenia–platelet count <150 000/μL, disseminated intravascular coagulation, hemolysis); or 3. Uteroplacental dysfunction (such as fetal growth restriction, abnormal umbilical artery Doppler waveform analysis, or stillbirth). Eclampsia was diagnosed as the presence of new-onset grand- mal seizures in women with preeclampsia.

Data analysis: Data were analyzed using SPSS statistical package version 22, (IBM Corp, Armonk, NY).

Statistic tests used were Chi-square and ODDs Ratio.

Results:

Overall number of total admissions during the study was 34,215 while cases with pregnancy > 20 weeks were 33,205. Primi cases were 55% (18,263/33205), Multipara cases 45% (14942/33205) and total number of cases with preeclampsia and eclampsia were 5.59% (1859/33205). 46.4% (855/1859) of preeclampsia cases were multigravida while 54% (1004/1859) were primigravida. Multigravida preeclampsia cases constituted by Multigravida with history of preeclampsia in prior pregnancy as 86% (735/855) and with normotensive prior pregnancy as 14%(120/855).

Table 1: Showing Multigravida Cases and Incidence of preeclampsia in current pregnancy (chi-square statistic is 2431.5, p<0.00001)

Group	Number of Cases [N]	Incidence of Preeclampsia
Multigravida with history of preeclampsia in prior pregnancy	(16.4%) 2450/14942	30% (735/2450)
Multigravida with normotensive prior pregnancy	(83.6%) 12492/14942	1% (120/12492)

Table 2: Showing recurrence of Gestational Vascular Complications (60%) [1470/2450] in Multigravida Cases with history of preeclampsia in prior pregnancy

Preeclampsia	50% [735/1470]
Gestational hypertension	35% [515/1470]
Abruptio placentae	3% [44/1470]
HELLP syndrome	8% [118/1470]
Others	4% [58/1470]

Table 3: Showing Risk of Recurrence of preeclampsia by Interpregnancy interval in multigravida with history of preeclampsia in prior pregnancy

Inter-Pregnancy Interval	N= no. of cases	Recurrence of Preeclampsia
<24 months	527	28% [150/527]
2 to 3 years	1012	29% [300/1012]
3 to 5 years	585	31% [181/585]
5 to 6 years	208	32% [66/208]
>6 years	118	32% [38/118]

Odds Ratio for Risk of Recurrence of Preeclampsia with Inter-pregnancy interval >24 months compared to short interval was 1.0989 (95%CI 0.8883 to 1.3593).

Table 4: Age wise distribution in each interpregnancy interval within multigravida cases with history of preeclampsia in previous pregnancy

Inter-Pregnancy Interval	N= total no. of cases (2450)	>18-21 years	21-30 years	30-35 years	>35 years
<24 months	527	301/527 [57%]	163/527 [31%]	42/527 [8%]	21/527 [4%]
2 to 3 years	1012	142/1012 [14%]	600/1012 [59%]	245/1012 [24%]	25/1012 [2.5%]
3 to 5 years	585	81/585 [14%]	251/585 [43%]	203/585 [35%]	50/585 [8.5%]
5 to 6 years	208	19/208 [9.1%]	42/208 [20%]	129/208 [62%]	18/208 [9%]
>6 years	118	-	10/118 [8%]	20/118 [17%]	88/118 [75%]

Discussion:

In this study we found the prevalence of preeclampsia 5.9% similar to the previous study done in Indian setting.[17] Preeclampsia is primarily regarded as a disease of first pregnancy. In our study, 54% were primigravidas and 46.4 % were multigravidas. Several other authors have reported primiparity in 52-73% patients of preeclampsia. In our study, both primigravida and multigravida were equally affected with eclampsia. But literature indicates that eclampsia is a disease of primigravida. According to Hellman incidence of eclampsia in primigravida and multigravida was in the proportion of 3:1.[18]

The incidence of preeclampsia was much higher in multigravida group with history of preeclampsia in previous pregnancy (30%) than with the normotensive history group (1%) p<0.00001. This finding was slightly different from one of the previous study[8] but it gives robust finding that preeclampsia in previous pregnancies are important risk factor for recurrence of preeclampsia in subsequent pregnancy very similar to one of the previous survey.[19]

Of all the recurrence of gestational vascular complications, Preeclampsia contributed 50%, Gestational hypertension 35%, abruptio placentae 3% and HELLP syndrome 8% similar to the findings of the french study.[20]

Hernandez-Díaz et al. included a cohort of pregnancies from the first antenatal visit (usually at 8 to 12 weeks'gestation) with diagnosis of pre-eclampsia or eclampsia and a subsequent pregnancy between January 1987 and December 2004.[21] The study reports a 14.7 % risk of recurrent pre-eclampsia. For those women with a history of pre-eclampsia in the first pregnancy the risk of recurrence was 13.1 % if they became pregnant within 2 years and 15.8 % if the next pregnancy was after 8 years or later. But in our study overall risk of recurrence was 30%, for short inter-pregnancy interval (<24 months) 28% and 32% for inter-pregnancy interval >6 years, different results can be attributed to different population composition, literacy rate and socioeconomic status.

Age has an important influence on the incidence of hypertensive disorders of pregnancy. In our study highest incidence of the hypertensive disorders occurred among those aged 18 to 22 years and also this was the largest age group in short (<24 months) inter-pregnancy interval. This could be because the majority of conceptions take place in this age group in our country. In our study majority of preeclampsia patients were between the ages of 18 to 22 years. This may have confounding effect on the study.

In our study there was no significant increased risk of recurrence of preeclampsia due to difference in inter-pregnancy interval as suggested by Odds Ratio (for Risk of Recurrence of Preeclampsia with Inter-pregnancy interval >24 months) 1.0989 (95%CI 0.8883 to 1.3593) which was similar to previous studies.[22,23] However there was slight increased risk in larger inter-pregnancy interval >6 years.

In addition, even though among the risk factors for recurrent pre-eclampsia, inter-pregnancy interval may be regarded as a minor contributor, it is nonetheless, together with weight control, a modifiable factor through which to intervene before conception.

Conclusion:

Patients with a history of preeclampsia or HELLP syndrome during the index pregnancy are at increased risk for obstetric complications in subsequent pregnancies.

The recurrence of an obstetric vascular accident is experienced with fear by the practitioner and the patient. Our study aimed to highlight predictive factors of recurrence.

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Case Report: Obstetrics

Seizures in the Early Postpartum Period: A Rare Case of Spontaneous Cryptogenic Subarachnoid Hemorrhage Posing Diagnostic Dilemma

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Abstract

Background: Seizures in the early postpartum period can have several differentials including eclampsia and cerebral venous thrombosis. Rare causes of seizures like spontaneous subarachnoid hemorrhage can create diagnostic dilemma in some cases. Though these cases are rare, yet those constitute the highly morbid complications of pregnancy and a detailed investigation is mandatory in all cases of postpartum seizures to come to a definitive diagnosis. In this article we present the case of a young primigravida who presented on the 10th puerperal day with headache and episodes of generalized seizures. Radiological evaluation revealed acute subarachnoid hemorrhage involving the right sylvian fissure and basal cisterns extending into the anterior interhemispheric fissure. The absence of any aneurysms or vascular malformations on catheter angiogram along with negative coagulation screen led us to the diagnosis of cryptogenic subarachnoid hemorrhage as the cause of seizure. The lady responded to conservative management and is now on follow up without any recurrence of symptoms

Keywords: Seizure, postpartum, subarachnoid hemorrhage, cryptogenic.

Introduction:

Though eclampsia remains the most common cause of seizures in the puerperal period, there can be other causes of postpartum seizures as well. Different cerebrovascular incidents and intracranial infections can give rise to similar conditions. As there is significant overlapping of the clinical features of the varied causes of postpartum seizures, a meticulous approach is often warranted for proper management of these conditions. We hereby present a case of spontaneous non aneurysmal subarachnoid hemorrhage (SAH), which is a rare cause of postpartum seizures.

Case Report:

A 33-year-old lady presented on the 10th day of puerperium with complaints of severe headache for last two days and two episodes of generalized tonic clonic seizures (GTCS). Patient had an elective caesarean

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section done at 39 weeks of gestation for maternal request under spinal anesthesia. The intraoperative and post-operative period was uneventful. She was discharged from the hospital on fourth postpartum day in satisfactory condition. This lady was a booked case in her first pregnancy. Antenatal period was uneventful. There were no complaints of headache, unconsciousness or visual disturbances during the antenatal period. There was no history of seizures in the past. Patient was normotensive throughout the antenatal period. On the 8th postpartum day, she started having severe headache which was persistent for the next two days. On the 10th postpartum day, she had one episode of GTCS which started insidiously, without any warning signs. She was unconscious during the event and could not recall the incident later. There was a brief period of post-ictal confusion. Following this event, she was brought to the hospital, where she had another similar event of GTCS. On examination, she was afebrile, pulse rate was 92 beats/minute and blood pressure (BP) 180/110 mm Hg (mercury). She was conscious, alert and obeying commands. There was no speech or visual problems or weakness or numbness in any parts of the body. Deep tendon reflexes were maintained and plantar response was bilaterally down going. Pupillary response was normal and fundoscopic evaluation was unremarkable. There was no neck pain or neck rigidity. Initial Computed Tomography (CT scan) of brain revealed acute SAH in the right sylvian fissure extending to the basal cisterns as well as the anterior interhemispheric fissure (Fig. 1). There were some evidences of convexity SAH also. There was no ventriculomegaly or blood inside the ventricle. The brain parenchyma was normal. Urine examination did not reveal any proteinuria. Following this she was started on nimodipine and levetiracetam. Complete hemogram, liver and renal function tests were normal. A formal Digital Subtraction Angiography (DSA) of the cerebral vessels was done. There was no evidence of any aneurysm or arterio-venous malformations (AVM) (Fig. 2). Coagulation studies including protein C, protein S, antithrombin III and Anticardiolipin antibody IgG, IgM were normal. No Lupus anticoagulant was detected. There were no further episodes of seizure during the hospital stay. The patient was closely monitored and discharged on day 6 of admission following substantial improvement of symptoms. On follow up at two weeks of admission, there was complete subsidence of headache with no further episodes of seizures. Follow up CT scan of brain done after three weeks showed complete resorption of SAH and no increase in the ventricular size. Repeat angiogram was advised but the patient denied any further investigations. The patient is now been followed up for two years without any further related complaints.

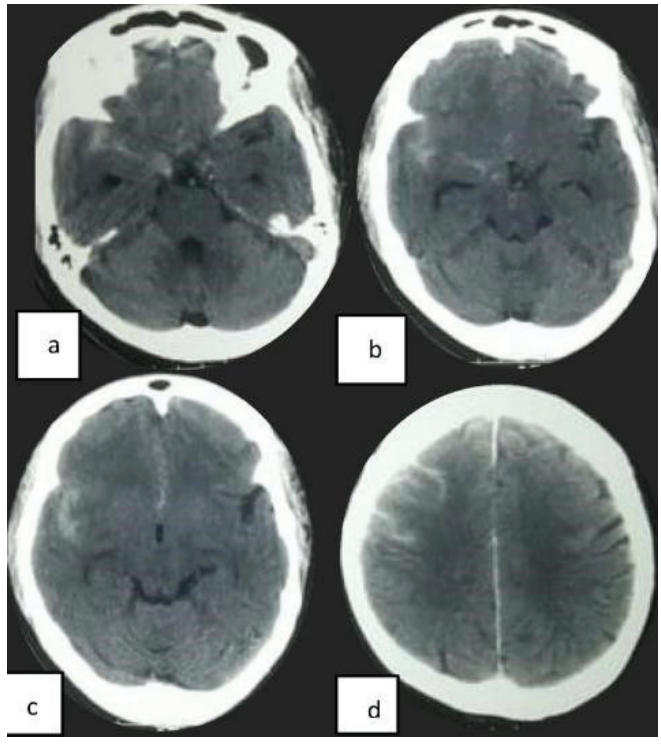

Fig. 1 CT scan of brain done on the day of admission. a. acute subarachnoid hemorrhage involving the right sylvian fissure. b. extension of acute subarachnoid hemorrhage in the basal cistern. c. extension of acute subarachnoid hemorrhage in the anterior inter hemispheric fissure. d. acute subarachnoid hemorrhage involving the convexity of right frontal lobe.

Discussion

Episodes of seizures in the early postpartum period raise the possibility of eclampsia in the first instance. Eclampsia is defined as a condition in which episodes of convulsions and/or coma occurs during pregnancy or early postpartum period in patients known to have signs or symptoms of preeclampsia. There are no clinical symptoms or laboratory tests to predict or diagnose eclamptic seizures, except for early detection of preeclampsia. However, patients presenting with eclampsia can have a spectrum of presentation starting from severe hypertension and proteinuria to mild or absent hypertension with no proteinuria.[1] It is also not unusual for seizures to precede overt hypertension or proteinuria in patients of eclampsia.

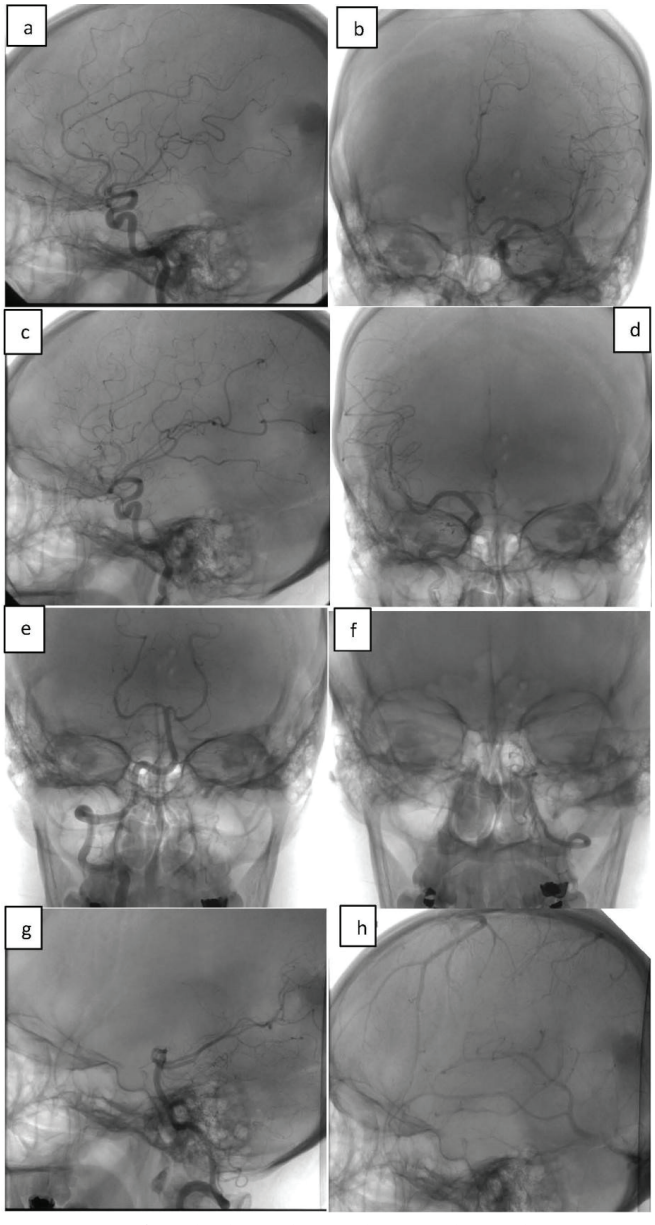

Fig. 2 DSA of cerebral vessels reveals normal vasculature pattern. a and b. Left internal carotid artery, anterior communicating artery, left anterior and middle cerebral artery shows normal course, caliber and branching pattern. c and d. Right internal carotid artery, right anterior and middle cerebral artery shows normal course, caliber and branching pattern. e. Right vertebral artery is dominant. f. Left vertebral artery is non dominant. g. Vertebro basilar arterial circulation shows usual branching pattern, basilar tip is clear. h. Venous phase shows normal drainage pattern

So, in patients presenting with postpartum seizures in the absence of proteinuria or history or persistent hypertension antenatally or in the postpartum period, consideration of eclampsia can not be ruled out definitively. Cerebral imaging findings in eclampsia are similar to those found in patients with hypertensive encephalopathy and includes edema or infarction in the subcortical white matter and adjacent grey matter, mainly in the parieto-occipital region as well as occasional intraparenchymal hemorrhages.[2]

There is significant overlapping of symptoms with some of the close differential diagnoses which poses diagnostic dilemma in such cases. Headache and convulsions in the postpartum period raise the suspicion of cerebral venous thrombosis (CVT) which is a common cause of maternal stroke. In some recent studies, the incidence of maternal strokes has been estimated to be approximately 30 in 100,000 pregnancies and 7.4% of maternal morbidity has been accounted to this condition.[3,4] The incidence of CVT in Indian population is higher as compared to literatures from developed countries.[5] Clinical features of CVT are related to either raised intracranial pressure due to impaired venous drainage or focal brain injury from venous infarction or hemorrhage. Most patients present with new onset stroke like symptoms including headache, cranial nerve involvements, seizures, altered sensorium and focal neurological deficits.[6] Radiological findings of CVT are very similar to that of eclampsia and include intraparenchymal hemorrhage and SAH as well. Only finding of thrombus on venogram gives a direct clue to the diagnosis, though small thrombi are difficult to pick up on conventional imaging.[5]

The severity of headache and absence of any focal neurological signs or cranial nerve involvement in our case was not congruent with the common features of CVT or cerebral infarcts. This led us to arrange for an early CT scan of brain. The CT scan findings of SAH involving the sylvian fissure, basal cisterns and the anterior interhemispheric fissure are more in favor of bleeding from large vessels i.e., aneurysms or AVM. Incidence of SAH is documented to be five times higher during pregnancy as compared to the nonpregnant state in some previous studies.[7] The most common cause of nontraumatic SAH in pregnancy and puerperium remains to be ruptured aneurysm.[8] Recent studies do not show any increased incidence of bleeding from unruptured cerebral aneurysm but contradictory evidence exists regarding bleeding risks of cerebral AVMs.[9,10,11] In our patient no obvious vascular abnormality was noted on DSA. It also excluded the diagnosis of CVT in this case. Although hemorrhagic complications are not uncommon in CVT with some studies reporting about one third of patients presenting with intracerebral hemorrhage

or hemorrhagic venous infarcts, isolated SAH is rare and reported to be 0.8% in one international series.[12] Patients of PIH can also present with SAH, but in most of the cases the bleeding is restricted to the cerebral convexities. There is one case series of SAH in PIH where the convexity bleed has extended to the sylvian fissure or interhemispheric fissure in one of the three cases described.[13]

For further evaluation of the cause of SAH, a detailed coagulation screening was done which also came out to be negative. Absence of any features of infection including fever or neck rigidity did not prompted us to do further investigations to rule out meningitis as a cause of seizures. Following this we came to the conclusion that the cause of seizures in our patient was cryptogenic SAH, which is a rare cause of seizures in pregnancy or postpartum period. In about 15% of patients undergoing DSA for spontaneous SAH in general population, no obvious vascular abnormalities were detected in different case series and are described as cryptogenic subarachnoid hemorrhage.[14] On detailed analysis of the pattern of SAH on CT scan images, two main subgroups have been described. van Gijn et all. described a subset of patients of spontaneous cryptogenic SAH who were in good clinical condition and fulfilled the radiological criteria of epicenter of the hemorrhage immediately anterior to the mesencephalon without extension of bleed to the anterior aspect of the interhemispheric fissure or lateral aspect of the sylvian fissures and absence of intraparenchymal bleed or intraventricular clot. Small volume of blood is accepted in dependent portions of the occipital horns.[15] This subgroup was described as perimesencephalic SAH and consisted of majority of the cryptogenic SAH patients. Those patients were found to have a benign course with good prognosis and low rebleeding and vasospasm rates as compared to aneurysmal SAH.[16] Based on the low rebleeding rates and given the risk associated with further angiographic studies being more as compared to finding aneurysms as the cause of bleeding, no further investigations were warranted in this subset of patients in most of the studies.[16,17] In contrast, the subset of patients of cryptogenic SAH not fulfilling the above criteria were designated as nonperimesencephalic SAH and were found to have a clinical outcome, rebleeding and vasospasm rates similar to aneurysmal SAH. The source of SAH in perimesencephalic SAH subset of patients was depicted to be venous in origin in majority of the cases.[15] Venous hypertension has been postulated to be the cause of bleeding in several case studies. It has been reported in some cases after physical exertion and the pathophysiology has been described as increased intrathoracic pressure leading to impaired jugular venous return and elevated intracranial venous pressure leading to venous bleeding.[18] Two cases of perimesencephalic SAH has been reported till date during pregnancy and only one case in the postpartum period, all presenting with severe headache, nausea, vomiting or photophobia.[19,20] To the best of our knowledge, no cases of cryptogenic SAH have been reported in the pregnancy or postpartum period presenting with seizures. We hereby report the only case of postpartum seizure due to cryptogenic SAH with a follow up of two years without recurrence of any symptoms including seizures.

Conclusion:

The differential diagnoses of seizures in pregnancy and postpartum period are varied and present with closely overlapping symptoms. Rare causes of seizures like non aneurysmal SAH can create diagnostic dilemma in some cases. Though these cases are rare, yet those constitute the highly morbid complications of pregnancy. Neurosurgical intervention may be warranted frequently in some of the cases including SAH due to ruptured cerebral aneurysm or AVM and a multidisciplinary approach should always be adopted for proper management of such cases.

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