Vol. 6, No. 3, September, 2013

COMPREHENSIVE BULLETIN ON SAFE MOTHERHOOD INITIATIVE

THEME : INFECTION IN PREGNANCY

INNOVATION TO IMPLEMENTATION

Safe Motherhood Committee - FOGSI

Editor : **Dr. Sadhana Gupta**
Chairperson
Safe Motherhood Committee (2011-2013)

HELPING MOTHER SURVIVE - FOGSI JHIPEGO PROGRAM IN NORTH ZONE

HMS programme held at Gorakhpur on 30th June, 2013

HMS ESI Hospital Basai Darapur, New Delhi 5th July, 2013

HMS at Queen Mary Medical College, Lucknow 27th July, 2013

HMS S.N. Medical College, Agra 3rd August, 2013

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11th August, 2013

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on
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HMS at
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East Zone Yuva FOGSI - 6th, 7th April 2013, Guwahati Inaugural Function, Unfolding and glittering of Behold the girl, begin a Tomorrow & Pre Congress Workshop

Panel on 'Why Mothers Die on 6th, 7th April at Guwahati

South Zone Yuva FOGSI - 17th, 18th August 2013, Trichy Inaugural Function, Unfolding and glittering of Behold the girl, begin a Tomorrow

Chairperson SMC conducted symposium of high risk pregnancy

contents ...

FOGSI World Congress in Women's Health Care (Vision 2022) held at Bangaluru on 7th - 9th June 2013

International Congress on Critical Care at Pune on 19th - 21st July, 2013

FOGSI-FIGO International Conference on Recent Advances in Obs & Gyn. at Hyderabad on 13th - 15 Sept. 2013

President's Message

Dear FOGSIAN's

My congratulations yet again to Dr. Sadhana Gupta and her team for leading many initiatives with Passion and Commitment.

Even though the challenges in the South Asian regions are similar, the sheer size of our country with a one billion plus population presents a huge additional challenge ! We have the option of using the large human resource at FOGSI as our strength and harness their energies. Along with our collegues in other parts of South Asia, we will be the catalysts for the change we want to see in Womens Health Care in this region.

We have recognised the need to figure out what works for us - to move from Innovation to Implementation.

A lot has been done - but there is a lot more to do . .

Dear friends. . . We have come a long way with FOGSI, but we have miles to go.

Let us realise that the reality in INDIA is that we are still dealing with significant challenges dealing with INFECTIONS such as malaria, hepatitis, tuberculosis,viral infection; we have to figure out a smart way of what works for us - a clinical approach in pyrexia, UTI, HIV that can be cost effective and patient friendly.

Let us step forward with a mission to complete the unfinished agenda on establishing centers of excellence in womens health care - let us strive to make our dreams a reality.

Dr. Hema Divakar
President FOGSI

Vice-President's Message

Dear FOGSIAN's

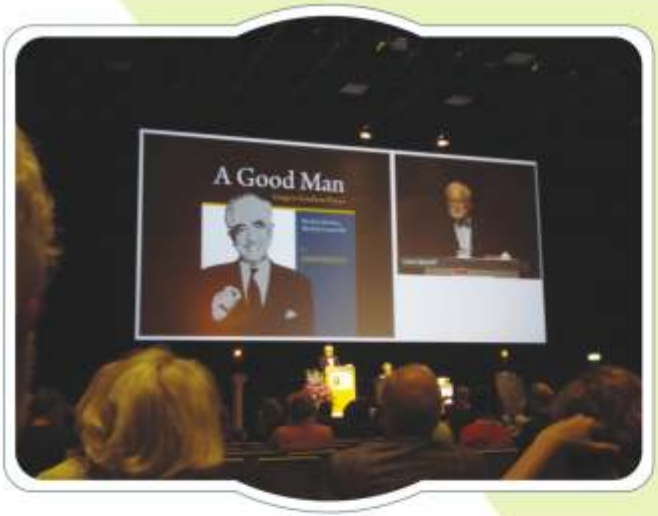
My hearty congratulations to Dr. Sadhana Gupta, Chairman Safe Motherhood Committee FOGSI for her consistent effort and hard work for regular release of safe motherhood bulletin. In her tenure the bulletin has become immensely popular among FOGSI members due to it's content, quality and aesthetic printing.

This issue has the theme 'Infection in Pregnancy', which is very much relevant for safe motherhood and optimum fetal outcome. In our country hepatitis, malaria, tuberculosis is very much prevalent. These infections can take serious turn in pregnancy, if not diagnosed and treated properly. Viral infection not only effect mother but also can cause serious consequence in fetus and neonate. Prevention of parent to child transmission of HIV is an important opportunity to curb fresh cases of HIV. Proper and safe vaccination in pregnancy is also crucial issue which must be very clear to every practitioner.

I believe that this issue will completely fulfill the aspiration and need of all practitioners, not only obstetricians in managing and decision making in facing infection in pregnancy, which will finally help our patients who are precious mother and child.

I finally wish Dr. Sadhana Gupta all the best and very enjoyable learning and sharing of memory of FOGSI events to readers,

Dr. Alpesh Gandhi
Vice-President
FOGSI-2013



First Global Conference on Contraception & Reproductive & Sexual Health on 15th - 22nd May, 2013 at Copenhagan, Denmark

29th ESHREE Conference held at London on 6th - 9th July, 2013

Vice-President's Message

It gives me immense pleasure to know that the Safe Motherhood Committee is bringing out the sixth issue of safe motherhood bulletin on "Infections in Pregnancy".

India continues to contribute about a quarter of all global maternal deaths. Infections in the pregnant woman are an important cause of maternal and neonatal morbidity and mortality particularly in our country. Pregnancy does not alter a woman's resistance to infection. Fortunately these patients are young and otherwise healthy and it is easier for them to recover.

A proper screening for infections would help in recognition and treatment of any underlying infections. Identifying risk factors for sepsis is an important process to help guide physicians to more closely monitor those at an elevated risk.

Maternal sepsis can be a severe complication of pregnancy or birth, which if untreated, can rapidly progress in severity to septicaemic shock and eventually death. This is more so in cases of home delivery.

"A two-pronged approach is needed—one focusing on issues with home delivery and the other concentrating on infection control measures in healthcare facilities."

Dr Sadhana Gupta has been doing commendable work in trying to reduce MMR and I am sure this issue is going to be as beneficial as the earlier ones.

Dr. Jayant Rath
M.D, F.I.C.M.C.H.
Vice President, FOGSI (2013)

Vice-President's Message

It is my pleasure to write a message for the Bulletin on Safe Motherhood Initiative. Developing countries like India need to focus efforts to reduce maternal mortality & morbidity. FOGSI and The Government of India are working together through many projects towards this common goal. Dr. Sadhana Gupta, Chairperson of the Safe motherhood committee of FOGSI, has been conducting various important activities through her committee for disseminating information & knowledge. I wish her all the best for this bulletin as well as for her future projects.

With Regards,
Dr. Ashwini Bhalerao Gandhi
Vice President FOGSI 2013
Chairperson of the Adolescent Health Committee of
FOGSI (2004-08)

HMS - North Zone ToT Workshop on 27th April 2013 at New Delhi

Training Programme for Non-specialist doctors at Bellary

ToT Workshop for PATH - FOGSI Oxytocic initiative on 27th April, 2013 at New Delhi

Editor's Desk

It is a moment of great pleasure to communicate with you all at the precious moment of release of sixth issue of safe motherhood bulletin. I am indebted l to all learned authors, writers and contributors which made possible a dream come true and thankful to all readers for their love and appreciation of bulletin.

This issue has theme of **'Infections in Pregnancy'.** In Universe nature has destined and designed itself to cohabit millions of organism ranging from microorganism to highly developed human being together. Nature also wished to nurture as well complete it's circle by destruction. We have designed this issue to have a deep insight into the subject of infection during pregnancy, when a new life is in formation. Infestation and Infection by virus, bacteria, protozoa, fungi can cause illness of varying severity in pregnancy. A pregnant woman is more vulnerable to infection, many physiological changes in pregnancy can make diagnosis difficult and alter the course of disease. At the same time the fetus is also developing and growing at varying pace in different trimesters of pregnancy. Any infection of whatever cause and severity can effect fetus adversely. Beside some obstetric events and interventions like premature rupture of membrane, internal examination and invasive procedure also contribute to infective morbidity.

Almost all clinician, not only obstetrician face the problem of pyrexia, rashes, chills, jaundice in pregnant women. Many times it becomes a dilemma as well challenge to diagnose and treat the condition properly. Consideration of safety for fetus and mother in diagnostic modality and medical intervention is further an important issue.

In this issue we have range of articles which almost covers every common presentation found in our country. Malaria, urinary tract infection, hepatitis, tuberculosis are very common ailment, effecting general as well obstetric population in India and learned authors have covered the critical points very well. Dilemma of diagnosis and treatment of viral infection, esp. TORCH have been tried to clarify and benefit the readers. Latest guidelines of obstetric management in HIV positive women have been summarized in the issue. Article on clinical approach to pyrexia in pregnancy will be beneficial to all clinicians.

It is always a great pleasure to share glimpses of all the main events of our federation ranging from academic, organizational to social events. They are memory to be not only cherished but also motivate for more and more work for the complete health of mothers.

Next January my tenure as chairperson safe mother hood committee is going to be completed. These three years will be one of the most worthy and revolutionary period of my life and What can I say than only to thank God in silence for chosen me for this work.

Wishing you thoughtful reading,

Yours sincerely

Dr. Sadhana Gupta

Clinical Approach to Pyrexia in Pregnancy

Dr. Bharti Maheshwari
Asso Prof.
Dept of Obs and Gyne
Muzaffarnagar Medical Coll
Mzn

Temperature is ultimately regulated in the hypothalamus. A trigger of the fever, called a pyrogen, causes a release of prostaglandin E2 (PGE2) which acts on the hypothalamus to generates a systemic response back to the rest of the body, causing heat-creating effects to match a new temperature level.

Ranges of Normal Temperature at Different Sites (box 1)

- Temperature in the anus (rectum/rectal) is at or over 37.5–38.3 °C (99.5–100.9 °F)
- Temperature in the mouth (oral) is at or over 37.7 °C (99.9 °F)
- Temperature under the arm (axillary) or in the ear (otic) is at or over 37.2 °C (99.0 °F)

In many respect hypothalamus works like a thermostat. When the set point is raised, the body increases its temperature through both active generation of heat and retaining heat.

Increased temperature in humans can be defined as –

Pyrexia, Hyperpyrexia and Hyperthermia

PYREXIA Is one of the most common **medical sign** and is characterized by an elevation of body temperature above the normal range of 36.5–37.5 °C (97.7–99.5 °F) due to an increase in the temperature regulatory set point: Harrison's textbook of internal medicine defines a fever as a morning temperature of >37.2°C (>98.9°F) or an evening temperature of >37.7°C (>99.9°F) while the normal daily temperature variation is typically 0.5°C (0.9°F).[1]

HYPERPYREXIA is a fever with an extreme elevation of body temperature greater than or equal to 41.5 °C (106.7 °F). Such a high temperature is considered a medical emergency as it may indicate a serious underlying condition or lead to significant side effects. The most common cause is an intracranial hemorrhage. Other possible causes include sepsis, Kawasaki syndrome, neuroleptic malignant syndrome, drug effects, serotonin syndrome, and thyroid storm

HYPERTHERMIA is an increase in body temperature over the body's thermoregulatory set-point, due to excessive heat production due to an outside source. ex-heatstroke, neuroleptic malignant syndrome, malignant hyperthermia, stimulants such as amphetamines and cocaine, idiosyncratic drug reactions, and serotonin syndrome.

A fever can be caused by many different conditions ranging from benign to potentially serious. Studies suggest that fever is useful as a defence mechanism as the body's immune response can be strengthened at higher temperatures, however there are arguments for and against the usefulness of fever, and the issue is controversial. With the exception of very high temperatures, treatment to reduce fever is often not necessary; however, antipyretic medications can be effective at lowering the temperature, which may improve the affected person's comfort.

Fever in pregnancy is not a normal condition, it may be completely unrelated to pregnancy or may be manifestation of serious condition directly related to pregnancy and may adversely affect the fetus. It is easier to get fever in pregnancy as immune system is naturally suppressed

Infections are the most common cause of fevers, however as the degree of temperature rises other causes become more common. Infections commonly associated with hyperpyrexia include : roseola, rubeola and enteroviral infections. Immediate aggressive cooling to less than 38.9 °C (102.0 °F) has been found to improve survival

Temperature should be taken at every antenatal visit and women should be counselled to report whenever they have fever rather than simply taking some antipyretic and ignoring it. Fever in pregnancy could be due to simple strain like flu, UTI or due to some serious bacterial, viral infection affecting pregnancy outcome.

Causes of Pyrexia

1. **Infections**
   - **Parasitic And Protozoal -**
     Malaria, toxoplasmosis, listerosis, intestinal worms, dengue
   - **Viral -**
     influenza, Rubella, cytomegalovirus(CMV), measles, mumps, chickenpox(varicella), parvovirus , herpes simplex, HIV
   - **Bacterial -**
     GP B STERTOCOCCI, urinary tract infection, respiratory tract infection, tuberculosis, gastroenteritis, gonorrhea, syphilis, Chlamydia, typhoid, hepatitis, typhoid
   - Various skin inflammations, *e.g.*, boils, or abscess
2. **Immunological - Lupus** - erthromatosis, sarcoidosis, inflammatory bowel disease
3. **Tissue Destruction -**
   Which can occur in hemolysis, surgery, infarction, crush syndrome, rhabdomyolysis, cerebral hemorrhage
4. **Reaction To Incompatible Blood Products-**
5. **Cancers-lukaemia, Lymphoma**
6. **Metabolic-gout or Porphyria**
7. **Thrombo-embolic Processes -**
   Pulmonary embolism or deep venous thrombosis
8. **Pyreia of Unknown Origin** - persistent fever that cannot be explained after repeated routine clinical examination.

TO FIND OUT PATHOLOGY BEHIND FEVER WE HAVE TO TAKE DETAIL HISTORY WHICH ITSELF GIVE IMPORTANT CLUES FOR CAUSES OF FEVER .HISTORY SHOULD INCLUDE-details of temperature, association of other symptoms with detailed past, personal and family history (Box 2)

Clues In History - (box 2)

1. Degree, duration and pattern of temperature
2. Associating symptoms-
   - Chills and rigors-UTI, malaria, severe infection
   - headache, sore throat-URTI
   - running nose, malaise-influenza
   - diarrhoea, abd pain-gastroenteritis, typhoid
   - Leaking - chorioamnionitis
   - vaginal discharge-gonorrhoea, Chlamydia, gp b streptococcus
   - rashes-rubella, varicella,
   - burning micturition, abd pain-pyelonephritis
   - convulsion and coma-cerebral malaria, hepatic, meningitis
3. personal-sanitation, diet, occupation for tuberculosis
4. sexual history-partners detail history, for HIV and STD
5. past history of chronic illness/blood loss / hemorrhage/treatment-for tuberculosis / HIV
6. obstetrical history-h/o recurrent abortion, still birth, delivery of cong malformed baby
7. Family history

Clinical Examination (box 3)

- GENERAL EX-
- pallor, cyanosis, jaundice, Pulse rate, bloo pressure
- throat ex
- complete CVS, respiratory system, CNS ex,
- lymphadenopathy,

Abdominal ex-splenomegally, hepatomegally

- **Skin**- rashes, pigmentation, any wound
- **local ex**- vulva , vagina, cervix

Complete **clinical ex** should be done including general, abdominal and local ex (box 3)

Table 2. different pattern of rise of temperature with significance -

Pattern of Temperature	Character	Hints For Diagnosis
continuous	Above normal throughout day and not fluctuating > 1^{0} in 24 hrs	Pneumonia, typhoid, UTI, brucellosis
Intermittent-	Elevation for only certain period later cyclically to normal	Malaria, kalaazar, pyraemia
quotidian	Periodicity of 24 hrs	Pl. falciparum
Tertian	48 hrs periodicity	Pl vivax or ovale
quartan	72 hrs periodicity	Pl malaria
remittent	Remain above n throughout day and fluctuate > 1^{0}c in 24 hr	Infective endocarditis

Investigations

Routine

- Hb, Total leucocyte count, differential leucocyte count, ESR, platelet count
- Complete urine examination
- Sputum ex, stool ex
- Blood sugar
- Ultrasound
- X ray in 2nd trimester
- CT when indicated
- Peripheral blood smear
- Thick blood film for malaria
- widal test for typhoid

Specific

IgG and igM for suspected infections, specigfic test for q fever, brucellosis, listerosis, tuberculosis, gonorrhea, Chlamydia, HIV, syphilis whenever suspected.

Usually in pregnancy nowdays VDRL, HIV, HBsag, HCV (hepatitis c) done in all cases.

Common Causes of Fever in Pregnancy

There are some common causes of fever in pregnancy which are temporary and treatable.

Common Causes of Fever

- Influenza
- Urinary tract infection
- Upper respiratory tract infection
- In endemic areas-malaria, typhoid, tuberculosis, dengue
- chorioamnioitis

Rare

- HIV, syphilis,
- Toxoplasma, rubella, CMV
- Listerosis,
- Gonorrhoea
- Chlamydia

Fever Causing Abortion or Cong Malformation

- Rubella
- CMV
- Syphilis
- Varicella
- Parvo virus
- High grade temperature any origin

Urinary Tract Infection (UTI)

Up to 10 percent of expectant mother will get a urinary tract infection (UTI) at some point during their pregnancies. urinary tract system encompasses urethra, bladder, ureters, and kidneys. An infection occurs when bacteria gets into this system and multiplies. Most UTIs are bladder infections and aren't serious if they're treated right away with antibiotics and lots of liquids. If left untreated, a bladder infection may travel to the kidneys and cause a variety of complications, including preterm labor, a low birth weight baby, and sepsis. Some UTIs are asymptomatic, but

others come with symptoms such as a strong urge to urinate, a burning sensation with urination, cloudy urine, and/or blood in the urine, along with fever, chills, and pelvic pain.

Influenza

fever, chills, achiness, coughing, nausea, and vomiting signals influenza (or the flu). Pregnant women have a higher risk of getting the flu and becoming severely ill from it, as their immune systems are suppressed. How to tell if it's the flu or just a cold? The flu comes on quickly and your symptoms are more severe then with a cold, recommended treatment rest and plenty of fluids, along with an antiviral medication to shorten the span of symptoms and preventing serious complications. Centers for Disease Control (CDC) recommend that all pregnant women get the flu shot.

Upper Respiratory Infection (Common Cold)

This is viral infection of the upper respiratory tract, which includes the sinuses, nasal passages, pharynx, and larynx. You may have symptoms that mirror the flu, as well as a runny nose, sore throat, cough, and breathing difficulty. an upper respiratory infection is not as serious as the flu and usually resolves spontaneously. The symptoms usually last from 3 to 14 days, and. If persist for several days, it may be more serious infection (sinusitis, bronchitis, strep throat or pneumonia),

Gastrointestinavirus

The diarrhea and vomiting can cause serious consequences for pregnant women if left untreated, because dehydration can cause contractions and even preterm labor. Other potential side effects include hypotension, dizziness, weakness, fainting, and, in severe cases, electrolyte imbalance .Most cases of these viruses will resolve on their own, but fluids such as water and electrolyte, as well as the BRAT diet (bananas, rice, applesauce and toast) are helpful.. Signs of dehydration (little or no urine, dry mouth, excessive thirst, dizziness), should be watched for assessing severity of diseases.

Serious Causes of Fever and/or Chills

In rare cases, fever, chills, and pain are linked to medical conditions that affect only

Pregnant women — not just common illnesses.

Chorioamnionitis

In addition to high fever and chills, this bacterial infection of the membranes surrounding the fetus (the chorion and amnion) and the amniotic fluid can cause sweating, rapid heartbeat, tender uterus, and unusual vaginal discharge. If chorioamnionitis is severe or left untreated, the mother may suffer from infections of the pelvic region and abdomen, endometritis, and blood clots, and her baby could have complications including sepsis, meningitis, and respiratory problems. Risk factors for chorioamnionitis include prior amniocentesis (usually in the previous two weeks), and premature or prolonged rupture of the membranes. Antibiotic and proper fetal surveillance for infection of fetus is required

Septic Abortion

Septic abortion is when "the uterus and its contents become infected as a result of a surgically or medically treated miscarriage or abortion,". It occurs in the first trimester, and symptoms include a high fever, chills, severe abdominal pain or cramping, vaginal bleeding and discharge, and backache., it should be treated with antibiotics with complete evacuation of uterus. . If the condition is left untreated, potentially fatal septic shock may occur; signs include low blood pressure, low body temperature, little urine output, and respiratory distress. Risk factors for septic abortion include poor surgical technique at the time of D&C, preexisting cervical/uterine infection.

Listeria

Listeriosis is an infection that results from consuming contaminated food or water. Pregnant women, newborns, the elderly, and adults with impaired immune systems are most at risk. "Early symptoms of listeria may include fever, muscle aches, nausea and diarrhea. Symptoms may occur a few days or even two months after eating contaminated food. If infection spreads to the nervous system, it can lead to headaches, stiff neck, confusion, loss of balance, or convulsions. Not all babies whose mothers are infected will have a problem, according to the

American Pregnancy Association, but in some cases untreated listeriosis can result in miscarriage, premature delivery, serious infection in your newborn, or even stillbirth. An mother is advised antibiotics to keep her baby safe. To help prevent listeria, avoid: Hot dogs, lunch meats, or deli meats unless they are reheated until steaming hot Soft cheeses unless the label states that they are made from pasteurized milk Refrigerated p?t? or meat spreads (canned are okay) Smoked seafood unless it is an ingredient in a cooked dish such as a casserole

Fifth Disease (Parvovirus B19)

Fifth Disease is a common childhood illness, so many adults are already immune to it. The most common symptom in is joint pain and soreness that can last for days or weeks. Athough it's rare — less than 5 percent of all pregnant women become infected with parvovirus B19, according to the CDC — the virus can cause a woman to miscarry or her baby to be born with severe anemia.

Dengue Fever

Women have fever, myalgia, abdominal pain with decresed platelest. It can affect pregnancy in form of abortion, preeclapsia, still birth.conservative t/t is advised.

Treatment of Pyrexia in Pregnancy

General -

Rest and diet

Soup for the soul, sinuses, and throat, as well as any foods that make feel better like Scrambled eggs, applesauce, hot oatmeal, rice, or mashed potatoes are all comforting to you and good for your baby.. Stay away from fat in all its as well as sugar (which can prolong diarrhea). And don't forget to revisit your old morning sickness pal, ginger, which works just as well when your nausea's triggered by a virus.

Fluid

In the short term, liquids are more important than solids especially if woman is losing them through a fever, a runny nose, vomiting, or diarrhea. Aim for at least one cup an hour, and though any liquid especially nutritious fluids -vegetables, juices, smoothies. Hot beverages will definitely soothe a sore throat.

Milk - Continue to take Milk

Vitamin C -

Nature's most potent healer, so lay it on yourself in the form of C-rich fruits, vegetables, and juices . one can have less acidic choices (a mango or papaya, or honeydew, white grape juice that's C fortified.

Eat Smart

Stop colds before they even start — increase intake of fruits and veggies. Studies show that eating at least seven servings of fruits and veggies a day during pregnancy lowers your risk of developing upper respiratory infections like colds and sinus infections.

Colds are most commonly caused by rhinoviruses; cases of the flu are caused by influenza viruses.

decongestants should be avoided in pregnancy especially during the first trimester when the fetus's organs are forming should adopt more natural ways of relieving symptoms, including:

- Eating fresh garlic — known to have virus-fighting compounds (if you can actually get it down), or using anti-viral spices such as cardamom, cinnamon, and cloves in your cooking
- Humidifiers to keep the air around you moist (consider a warm mist humidifier)
- Saltwater gargles to relieve sore throat pain (try one teaspoon of salt in eight ounces of warm water to get the fastest relief)
- **Steam Inhalation or Nasal Lavage –** to relieve nasal congestion or sinus headaches (for lavage, dissolve a quarter teaspoon of salt and a tiny pinch of baking soda into eight ounces of lukewarm water, and use a nasal aspirator to irrigate — or clean — out your nasal passages)
- **FLU Shot -** is a safe and important way to protect mother and baby health.: According to a new study, babies born to mothers who were given the flu shot during the last trimester of pregnancy appear to be protected against the virus for the

first six months of life.

Those babies whose moms got the flu shot while pregnant are also less likely to be born prematurely, are bigger and healthier, and are less likely to be hospitalized during the first year than babies whose moms weren't vaccinated.

Medical Treatment

Antipyretic

Products containing aspirin or ibuprofen or naproxen are not recommended to take while pregnant; they can interfere with fetus development in the early months and create problems during labor later. Safe drugs during pregnancy are paracetamol, acetaminophen

Safe Antibiotics During Pregnancy -

Ampicillin, amoxicillin, cephalosporin - URTI,

Nitrofurantoin, AND neltimycin - UTI

Chloraphenicol-typhoid, zidovudine - HIV,

acyclovir, -HERPES, chloroquine, mefloquine - malaria

Pyremethamine – sulphadoxine - TOXOPLASMA

Metronidazole - amoebiasis, trichomoniasis, bacterial vaginosis

Antibiotics should be avoided in pregnancy are -

Azithromycin,streptomycin,doxycycline,clindamycin,tetracycline di

Fever in Pregnancy -

Do-

- Do proper temperature charting to know exact pattern
- take proper history to know disease behind temperature
- if temperature is not very high and duration is not long, start with conservative treatment
- intensive workup should be done -
  - when conservative t/t fails
  - high grade temperature
  - obstetric history
  - bad give only safe antipyretics and antibiotics

Table shows different infections having varying intensity of fever with characteristic associating symptoms. It can be utilized to know exactly the diagnosis

Details of infections causing fever in pregnancy

Infection	Associating Feature	Effect On Preg	Diagnosis
Rubella	Rashes, lymphadenopathy, arthragia	Abortion, still birth, cong rubella syn	IgM, PCR
CMV	Arthralgia, lymphadenopathy	Abortion, IUGR, microcephaly, intracranialcalcification, hepatosplenomegally, thrombocytopenia	Culture of urine, nasopharyngeal secretions, igM, PCR
varicella	rashes	Cong varicella syndrome in early pregnancy.	IgM, PCR
Parvo B19	Anemia, aplastic crisis,	Fetal loss in early preg, fetal hydrops	IgM, PCR of fetal and maternal blood
toxoplasma	Asymptomatic, h/o recurrent abortion	Abortion, IUGR, stillbirth, microcephaly, cerebral calcification	IgM, PCR
Hepatitis	Flu like illness, malaise, nausea, vomiting, rashes,	Abortion, preterm, and intrauterine death, postpartum haemorrhage. hepatic coma, renal failure, coagulopathy, infection	Serological detection of HBsag, HBeag, liver fx test
Herpes	Skin lesion	Premature labour, IUGR,	PCR

Infection	Associating Feature	Effect On Preg	Diagnosis
		fetal affection-chorioretinitis, microcephaly	
Gp b streptococcus	Fever with sorethroat, vaginal discharge	UTI, endometritis, preterm labour, neonatal infection causing sorethroat, pneumonia,	Culture or PCR
Syphilis	Fever with Rashes, RHINITIS, Genital ulcers	Abortion, preterm, intrauterine death. nonimmune fetal hydrops	Serological test-VDRL, FTA-ABS,PCR,
Malaria	Rigors, hypoglycemia, abdominal pain, headache, pallor (megaloblastic anemia), convulsion	Abortion, preterm, IUGR, IUD	MALARIAL parasites in thick blood smears
Listeria	Fever, nausea, diarrhoea	Late miscarriage, preterm, stillbirth	Blood culture
Urinay tract infection	Fever with chills and rigor followed by hypothermia, Burning and pain during micturition	Abortion, Preterm labour, intrauterine death due to high temp.	Complete urine ex including culture
Upper resp tract infection, tuberculosis	Sore throat Cough, lymphnodes	Preterm, IUGR, neonatal transmission	Tuberculin test, early morning sputum, xray in late preg, direct amplification tests and by gene probe
HIV	Fever, malaise, headache, sorethroat, lymphadenopathy, protracted diarrhoea, rash, candid tuberculosis, lymphoma, sarcoma, h/o exposure Vaginal discharge, itching, abd pain	Prematurity, IUGR perinatal morbidity and mortality, risk of neonatal transmission	Enzyme immunoassy, (EIA), polymerase chain reaction(PCR), Western Blot (Immuno-fluorescence)

Summary

- ALWAYS KEEP IN MIND that fever can affect pregnancy adversely,it is alarming sign so find out cause behind it earliest
- In viral infections usually there is flu like illness or malaise but viruses are teratogenic so take care to suspect these infections by proper history.
- High grade temperature should be lowered immediately as it can leads to abortion
- Associating symptoms are usually very helpful to reach to diagnosis
- Clinician should remain updated regarding current infections and their latest available method for diagnosis and available treatment which is best and safe
- Clinician should also remain updated regarding medicolegal part of termination
- Most important part is to create awareness about high risk factors about particular infection and its prevention from prenatal period.

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Malaria in Pregnancy

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Malaria is the second most common cause of infectious disease-related death in the world, after tuberculosis.[1] There are 104 countries or territories in the world presently considered endemic for malaria.[2] About 3.3 billion people – half of the world's population – are at risk of malaria.[3] According to the latest WHO estimates, there were about 219 million cases of malaria in 2010 and an estimated 660,000 deaths.[4] Sub-Saharan Africa has the largest burden of malarial disease, with over 90% of the world's malaria-related deaths occurring in this region. In South East Asia, the second most affected region in the world, India has the highest malaria burden, contributing to two-third of malaria burden in South-east Asia region. (With an estimated 24 million cases per year), followed by Indonesia and Myanmar.[5]

At least 6 million women worldwide are at risk of malaria infection in pregnancy.[6] In India actual data regarding incidence of malaria in pregnancy is limited. Some estimate suggest a very high incidence in the rural area. In one study in the undivided Madhya Pradesh the incidence of malaria amongst the pregnant women has been estimated to be as high as 220,000 per year.[7]

Malaria in pregnancy is a Priority Area in Roll Back Malaria strategy. According to the World Health Organization (WHO), malaria accounts for over 10,000 maternal and 200,000 neonatal deaths per year.[8] These figures may underestimate the impact malaria has in maternal morbidity and mortality. A recent study from Mozambique that assigned cause of maternal death via autopsy examination found that up to 10% of maternal deaths were directly attributed to malarial infection and 13% were secondary to human immunodeficiency virus (HIV)/AIDS, which can be exacerbated by coexisting malarial infection.[9] This suggests that in parts of the world where malaria is endemic, it may directly contribute to almost 25% of all maternal deaths. Malaria in pregnancy also contributes to significant perinatal morbidity and mortality. Pregnant women constitute the main adult risk group for malaria and 80% of deaths due to malaria in Africa occur in pregnant women and children below 5 years. In Africa, perinatal mortality due to malaria is at about 1500/day. In areas where malaria is endemic, 20-40% of all babies born may have a low birth weight.

Infection is known to cause higher rates of miscarriage, intrauterine demise, premature delivery, low-birth-weight neonates, and neonatal death. Severe maternal anemia, prematurity, and low birth weight contribute to more than half of these deaths.

Pregnancy presents special problems when complicated with malaria for following reasons:

1) Pregnancy is an immune compromised state to prevent rejection of the growing fetus. There is suppression of cellular as well as humoral immunity observed during pregnancy.
   A. This makes the pregnant women more vulnerable to infectious diseases.
   B. Disease is more severe with parasiteamia nearly 10 times higher as compared to non pregnant women.
   C. All the complications of P Falciparum are therefore more likely to occur in pregnant women as compared to non pregnant women, 3 times more likely to

suffer from severe malaria.

D. Presentation is more atypical

E. Non immune pregnant women are reported to have 2-10 times higher risk of death than non pregnant women with malaria [10,11]

2) Because of physiological changes in pregnancy the management poses special problems

A. Certain drugs are contraindicated in pregnancy and lactating women.

B. Physiological changes need special precaution and attention in the management of complicated malaria e.g. fluid and electrolyte management,

C. Careful decision needed for obstetric management of the cases as spontaneous abortion, low birth weight , IUGR, Preterm labour, IUD are more common.

This results, higher maternal mortality and perinatal morbidity and mortality as compared to pregnant women not suffering from malaria.

Human malaria is caused by four species of Plasmodia: P. falciparum, P. vivax, P. ovale, P. malariae. Most infections are due to either P. falciparum or P. vivax, but mixed infections with more than one malarial species also occur. The majority of malaria-related deaths are due to P. falciparum. In India approximately 1.8 million cases of malaria occur every year with 60-70% due to P vivax and 30-45% by falciparum. P malarie species is rarely found while ovale is not reported in India. (Pardal et al 2009)

Patho physiology of malaria :

Malaria is transmitted by the bite of the infected mosquito to a human being; the sporozoites in the saliva are transmitted to the blood. From the blood they enter the liver and in the hepatocytes. (Exo-erythrocytic phase). Where they multiply and release merozoites into the blood.

Erythrocytic phase: in the blood they invade the RBCs. In the infected RBCs the merozoites multiply and fill the RBCs till they burst and releases further merozoites in to circulation to invade further RBCS.

In some of the RBCs they produce gametocytes which when sucked by the mosquito enter into the reproductive cycle.

In P falciparum infection the infected RBCs have got the cite adhesive properties they adhere to the vascular endothelium, causing sequestration of the RBCs in the capillaries of different organ producing ischemia and infarct in the organ and Splenomegaly.

The sequestered cells are cleared by the macrophages and anemia results. Premature aging of the uninfected red cells induced by the infected cells also contribute to the anemia in malaria.

Repeated malarial infection leads to development of immunity. In areas where the infection is episodic the immunity fades away with time and the patients can develop more severe form of malaria. Therefore, the high risk group is pregnant women, children, traveler to endemic area, imunocompromised patients, patients suffering from HIV infection and malnourishment.

Placental Malaria

Infected RBCs express special protein on their cell membrane surface (CD 6 and Interadhesion molecule) which allows them to get adhered to vascular endothelium by chondroitin sulphate A and hyaluronic acid. This results to sequestration of infected erythrocytes (IE) in various organs and hamper the blood flow. In the placenta these IE get adhered to the placental membrane, trophoblast bands in the intervillous space and free trophoblast cells, this fills the intervillous space and produces fibrinoid necrosis of the villi. The poor perfusion across the villi results in IUGR, LBW, IUD and PTL. Cases with severe placental parasiteamia develop less severe sign and symptoms but are associated with poor fetal outcome.

Clinical Feature

Incubation period - 7-30 days

Uncomplicated Malaria

Initial symptoms and sign of malaria are not very specific and may be confused with many other conditions. Usual presenting features are; Headache, fever with or without chills and rigors, Vomiting and

diarrhea may be present in some cases. Splenomegaly may be present in late cases.

Severe Malaria:

Malaria infection is affecting one or more organ or system.

Organ affected	Signs	Lab finding	Manifestations
CNS	**Unconcious ness, coma/cerebral malaria**		Failure to localize or respond to stimuli or command Coma persisting 30 minutes after the generalized convulsion
	Convulsions		More than 2 generalized convulsions in 24 hours, sometimes only tonic clonic movement of eye balls without limb or face movements
	Impaired consciousness		Unable to sit without support
Respiratory system	**Pulmonary edema/ARDS**		Non cardiogenic pulmonary edema often aggravated with over hydration
Liver	**Jaundice**	Serum bilirubin >3mg%	
Renal	**Renal failure**	UOP <400 ml/24 hours with no improvement on hydration Se creatinin >3 mg/l	
CVS	**Hypotension/shock**	BP <80 mm HgCore /skin temperature difference of > 10°cCapillary refill >2 sec	
Metabolic	**Acedemia/acidosis**	Arterial pH < 7.25Plasma HCO_3 <15 mmol/lVenous lactate level > 5 mmol/l	Laboured breathing respiratory distress
	Hypoglycemia	Pl. glucose level <40mg%	
Hematological	**DIC**		Bleeding from gum, nose, GIT, evidence of DIC
	Hemoglobinurea		Macroscopic black, brown or red urine, in the absence of G6PD deficiency
	Severe normocytic normochromic anemia	Hb <5 gm% Hematocrit < 15% with parasiteamia > 100,000/l	
	Hyperparasitemia	>5% in non immune patient >20% in any patient	

In pregnant women the risk of development of complications are higher than non pregnant women. Amongst the pregnant women the complication are more in the plasmodium falciparum infection, in primigravidae and in the second trimester of pregnancy.

Diagnosis

Clinical feature: symptoms and signs of malaria are not very specific to malaria, hence, other causes of fever must also be ruled out.

WHO recommendation : suspect malaria if Patient comes with fever or history of fever in the last 48 hours and lives in malaria-endemic areas or has history of travel within the past 30 days to malaria-endemic areas

Who Recommendation (World malaria report 2012)

Prompt parasitological confirmation by microscopy, or RDTs, is recommended in all patients suspected of malaria before treatment is started.

Treatment solely on the basis of clinical suspicion should only be considered when parasitological diagnosis is not accessible.

Lab Diagnosis :

1. **Light Microscopic diagnosis :**

   Thick film and thin film examination is the gold standard for diagnosis of malaria

   A. Thick film - for detection and quantification of the parasiteamia
   B. Thin - helps to identify the species
   C. Buffy coat - in the condensed RBCs parasiteamia can be detected

Cheap, sensitive, detects parasiteamia, severity of parasiteamia, detects species, can assess response of drugs, and may diagnose other conditions also.

Micro tube condensation method with acridine orange followed by florescent microscopy

2. **Rapid Diagnostic Tests (RDT):**

   A. **Immunochromatographic tests :**

   Detects specific antigen available as dipstick, card and cassettes

   Types of tests:

   1. Histadine rich protein 2 specific to plasmodium falciparum
   2. Pan specific LDH
   3. Species specific LDH
   4. Pan specific aldolase
   5. Species specific aldolase

   Advantage : Easy to perform, rapid, no training required, simple to interpret.

   Disadvantage : Costly , antigen for P falciparum may remain positive for 3 weeks after the cure. Sensitivity varies depending upon the temperature and the humidity, does not detect the severity P falciparum parasiteamia

   B. **Immunologic tests**:

   Antibodies against the antigen may be detected; however, it is neither sensitive nor specific.

3. **PCR based molecular detection method :**

   To detect the DNA highly specific, very costly, helpful for studies for drug resistance, epidemiological study

4. **Placental histology:**

   To demonstrate the placental parasiteamia and placental lesions: syncytial knotting, syncytial rupture, placental barrier thickness, mononucleates, intervillous polymorpho-nucleates, parasitized erythrocytes and hemozoin.

Effect on fetus :

Febrile illness, placental parasiteamia and complicated malaria can adversely affect the fetal outcome.

Placental parasiteamia can result in poor placental perfusion and affect the fetal nutrition and oxygenation

I. Abortion : particularly in high grade fevers
II. Preterm birth: because of febrile illness, heavy placental parasiteamia or complicated malaria. Low birth weight and IUGR; placental parasiteamia causing chronic hypoxia. In endemic areas, malaria is estimated to be responsible for 20% of low-birth weight (LBW) infants, the greatest single risk factor for infant mortality. However, malaria can cause both intrauterine growth restriction (IUGR), related to the sequestration of malaria parasites in the placenta, and preterm labour (PTL), which is associated with symptomatic maternal illness in the third trimester Intrauterine death.
III. Still birth
IV. Neonatal morbidity
V. Neonatal deaths
VI. Congenital malaria: Transplacental infection is effectively prevented by the placenta, however recent reports suggest there is a correlation between placental parasiteamia and congenital infection ranging from 0-52%.
VII. Growth remains low in the first 6 months of life.

Effect on mother: severe anemia and complicated malaria with cerebral malaria, hepatic and renal failure are more common in pregnant as compared to non pregnant women.

Risk of death is more in pregnant as compared to non pregnant women

Management/Treatment

1. Hospital admission
2. Drug treatment for malaria (intravenous and oral) (artesunate, quinine, clindamycin, chloroquine, atovaquone-proguanil)
3. Antipyretics for fever.
4. Screening for anemia.
5. Management plan for follow-up.
6. Management of pregnancy-related complications
   - Monitoring for hypoglycaemia
   - Clinical assessment of pulmonary oedema and acute respiratory distress
   - Slow transfusion or exchange transfusion for anaemia
   - Suspicion of secondary bacterial infection if patient becomes hypotensive
7. Management of common obstetric problems with acute symptomatic malaria
   - Multidisciplinary approach to fetal compromise
   - Malaria treatment to prevent stillbirth and premature delivery
   - Tests for congenital malaria (placental histology and placenta, cord, and baby blood films)
   - Maternal counseling about vertical transmission of malaria

Managemnet of Uncomplicated Malaria

Earlier, any fever case was considered as malaria, until proven otherwise and presumptive treatment with chloroquine was initiated. Now, as per the drug policy 2011, presumptive treatment is no longer followed. The treatment regimen currently followed under the programme is as follow

Treatment of malaria :

Treatment of P Vivax malaria		
Drug Used	**Regimen**	
Chloroquine *, ** Available as tablet of 150 mg base	10 mg base salt/ kg body wt on day 1, 10 mg base salt/ kg body wt on day 2 & 5 mg base salt /kg body wt on day 3 (4 tab +4 tab + 2 tab Or 10 mg/ kg at 0 hour, 5 mg/ kg at 12, 24 and 36 hour (4tab +2+2+2 tab)	During pregnancy radical treatment with primaquine is not recommended
Amodiaquine	10-12 mg / kg body wt /day X 3 days	
Treatment of uncomplicated Plasmodium falciparum malaria in pregnancy		
Quinine * (National guideline 2010, India)	10 mg/kg body weight /day 7 days	Treatment of choice in first trimester, hypoglycemia is not so common in first trimester
Quinine**(WHO guideline)+Clindamycin	10 mg/kg body wt tds X 7 days + 10 mg/kg body wt bd X 7 days	Quinine monotherapy if clindamycin is not available
Plamodium falciparum malaria sensitive to ACTs (Artemisinin combination therapies)		
Artesunate + Clindamycin	4 mg/kg body wt bd X 3days + 10 mg/kg body wt X 7 days	In second and third trimester In first trimester if the only treatment immediately available or if quinine and clindamycin treatment fails
Artesunate + Sulphadoxine and Pyrimethamine * Each SP tab contains 500mg S and 25 mg P	4 mg/kg body wt/d X 3 days (4 tablets) + 25 mg /kg body wt+1.5 mg/kg body wt (3 tablets on day 1)	National policy 2010 India recommends it for 2nd and 3rd trimester in pregnancy Effective in areas where the 28 days cure rate with SP alone
Artesunate Available as 50 and 100 mg tablet + Amodiaquine available as 153 mg base/tablet Or Fixed dose formulation • 25/67.5 mg/ tablet • 50/135 mg / tablet • 100 / 270 mg / tablet	4 mg base/kg body wt /d X 3 days + 10 mg base/ kg body wt / d 3 days	4 tablets/day 4 tablets / day 8 tablet/d 4 tablets/d 2 tablets/d

Artesunate + lumefantrine Available as a fixed dose formulation	1.5 mg/kg/d + 9 mg/kg/d	For body wt 25-34 kg -3 tab/d X 3 day > 34 kg 4 tab /d x 3 days
Artesunate + Mefloquine	4 mg base/kg /d 3 day + 25 mg base / kg body wt (total)15 mg /kg body wt on day 110 mg /kg body wt on day 2 Or 8 mg /body wt /d X 3 day	
Second line therapy failing ACT treatment		
Artesunate Or Quinine + Clindamycin	2 mg/ kg /d X 7 day Or 10 mg/kg / TID X 7 days + 10 mg/kg/twice a day X 7 days	

Points to bear in mind while on oral antimalarial therapy :

1. First dose may be DOT
2. Drugs should be preferably be taken after meals
3. If patient vomits within 30 minutes of taking drug , repeat the dose
4. If condition does not improve or deteriorate in 48 hours , immediate medical attention should be taken

WHO recommendation for treatment of Pl. falciparum malaria in pregnancy

First trimester :

- Quinine plus Clindamycin to be given for 7 days (Artesunate plus Clindamycin for 7 days is indicated if this treatment fails);
- an ACT is indicated only if this is the only treatment immediately available, or if treatment with 7-day quinine plus Clindamycin fails or uncertainty of compliance with a 7-day treatment.

Second and third trimesters :

- ACTs known to be effective in the country/region or Artesunate plus Clindamycin to be given for 7 days, or quinine plus Clindamycin to be given for 7 days.
- Lactating women:
- lactating women should receive standard antimalarial treatment (including ACTs) except for dapsone, primaquine and tetracycline.

Treatment of severe malaria during pregnancy[12]

Artesunate	2.4 mg/ kg body wt IV or IM at the time of admission (time =0 hr), at 12 hour, at 24 hour, then once a day Once oral treatment started ACT X 3 days
Quinine	20 mg/kg IV in 5% Dextrose over 4 hours Maintenance 10 mg/kg IV infusion over 4 hours every 8 hourly starting at 8 hour after starting the first dose(infusion rate should not be more than 5 mg/kg/hr Once oral therapy starts-Quinine at 10mg base salt /kg body wt 8 hourly X 7 days including the days of Iv therapy Along with Clindamycin 10 mg/kg body wt twice a day X 7days

Other artimisinin derivative that can be used are

Artemether	3.2 mg/kg /IM state than 1.6 mg/kg body wt /d Once oral started full course of ACT
Arteether	150 mg IM Once oral started full course of ACT

Perenteral therapy once started should be continued for 24 hours even if case is able to take oral medicines

The following treatment should not be administered to patients with severe malaria:

1. Corticosteroids and non-steriodal anti-inflammatory agents (ibuprofen, aspirin)
2. Other agents given for cerebral edema (urea, mannitol)
3. Low molecular weight dextran
4. Epinephrine (adrenaline)
5. Heparin
6. Epoprostenol (prostacyclin)
7. Pentoxifylline (oxpentifylline);
8. Hyperbaric oxygen;
9. Cyclosporine (cyclosporin A.)

Managemnet of Complicated Malaria

Adjunctive therapies in malaria:

For the following clinical manifestation and complications adjunctive therapies are needed.

Complication or manifestation	Management
Coma	Maintain ABC Air way : lateral position, exclude other causes of coma, (hypoglycemia, infection and any medicineavoid heparin, adrenalin)
Hyperpyrexia	Tepid water sponging, fanning , antipyretic,
Convulsions	Check blood glucose Iv Or rectal diazepam Maintain air way
Hypoglycemia	Glucose containing fluid infusion
Anemia	Blood transfusion if severe anemia**
Acute renal failure	Check for fluid balance and urinary sodium if ARF diagnose manage accordingly or consider for hemodialysis or peritoneal dialysis
DIC	Fresh blood transfusion if available Platelet concentrate, Fresh frozen plasma
Metabolic acidosis	Exclude hypoglycemia , hypvolemia and septicemia Treat accordingly or consider for hemodialysis
Shock	Correct hemodynamic disturbances \rule out septicemia Broad spectrum antibiotics

Fluid management :

A careful fluid therapy is essential as there is a very thin dividing line between over hydration and under hydration in adults. Whereas under hydration can lead to hypotension and shock, worsening acidosis and renal perfusin and causing renal failure an over hydration can result in pulmonary edema. Both the situation can cause deterioration of maternal condition. Therefore, wherever possible for better monitoring central venous line insertion and CVP monitoring for fluid therapy is best. (Target 0-5 Cm H2o). Other parameters to be monitored are JVP, peripheral perfusion pressure, skin turgidity and urine output.

** Blood transfusion: in severe anemia it should be tailor made as there is no general recommendation. The complication is more severe in acute anemia as compared to chronic anemia in high endemic area.

Exchange blood transfusion: no definite recommendation about the EBT is given by WHO.

Common errors in diagnosis and management of severe malaria

Common errors in the diagnosis and management of the patient with severe malaria can have a fatal outcome. Many of these errors and subsequent deaths can be avoided with diligence and awareness.

a. The most common error is failure to consider malaria or severe malaria in a patient with either typical or atypical illness;
b. Failure to elicit a history of malaria exposure, i.e. recent travel history, from the patient or relatives;
c. Failure to identify *P. falciparum* in a dual infection with *P. vivax* or to recognize mixed morbidities

(malaria and influenza or viral encephalitis, hepatitis typhus, etc.), especially failure to diagnose other associated infections (bacterial or viral respiratory diseases);

d. Failure to calculate quinine dose based on body weight and giving the same dose for all adult patients;

e. Failure to monitor the rate of quinine infusion;

f. Failure to recognize respiratory distress (metabolic acidosis) or hypoglycemia in a patient with severe malaria;

g. Failure to perform ophthalmoscopic examination for the presence of papilloedema and retinal hemorrhages;

h. Failure to monitor fluid balance.

Errors in management

a. Delay in starting antimalarial therapy this is the most serious error, as delays in starting treatment may be fatal.

b. inadequate nursing care

c. incorrectly calculated dosage of antimalarial medicines

d. inappropriate route of administration of antimalarial agents (see inside front cover flap)

e. intramuscular injections into the buttock, particularly of quinine, which can damage the sciatic nerve

f. failure to switch patients from parenteral to oral therapy after 24h, or as soon as they can take and tolerate oral medication

g. use of unproven and potentially dangerous ancillary treatment

h. failure to review antimalarial treatment for a patient whose condition is deteriorating

i. failure to re-check blood glucose concentration in a patient who develops seizure or deepening coma

j. failure to recognize and treat minor ('subtle') convulsions

k. failure to recognize and manage pulmonary oedema delay in starting renal replacement therapy

l. failure to give antibiotics to treat possible meningitis presumptively if a decision is made to delay lumbar puncture

m. fluid bolus resuscitation in children with severe malaria who are not severely dehydrated

Obstetric Management :

There are risks of abortion, Preterm labour, intrauterine growth retardation, and intrauterine death in malaria because of febrile illness, severe anemia, placental malaria, poor feto placental perfusion and because of complications of malaria. Therefore, accurate diagnosis and timely management is essential.

Induction of labour and caesarean section should be done as per obstetric indication.

Mangement in Lactating Mothers

All lactating mother should receive the standard treatment for malaria including ACTs except dapsone, primaquine, and doxy cycline

Chemoprophylaxis :

Chloroquine prophylaxis : 500mg every week to all pregnant women and to those travelling in endemic area one week after they return from the endemic areas. Folic acid supplementation should be continued.

Intermittent preventive treatment in pregnancy using Sulphadoxine Pyramethamine[11]

According to an updated WHO policy recommendations (2012) for prevention of malaria in pregnancy in areas of high endemicity particularly south African countries IPT-p SP is effective despite of the fact some of the pl falciparum parasite carry quintuple mutation linked to SP resistance. The recommendation for the IPT-p SP are as follow :

I. In areas of moderate to high transmission zone it should be recommended to all pregnant women at each scheduled antenatal visits (4 antenatal care visits as per WHO recommendation)

II. First IPT-p SP should be started as early as possible in the second trimester

III. Each SP dose should be administered at least 1 month apart

IV. Last dose can be administered upto the time of delivery without any safety concerns

V. Folic acid at a daily dose equal to more than 5 mg should not be administered along with the Sp, as it counteracts the effectivity of the SP routine 0.4 mg prophylaxis can be taken

VI. If 5 mg folic acid is given it should be withheld for 2 weeks after the start of SP to have better efficacy.

VII. Iptp - SP should not be given to women receiving co-trimaxazole prophylaxis

VIII. Ideally IPT-p SP should be administered as a directly observed therapy DOT

IX. There is currently insufficient evidence for general recommendation for the use of Iptp -SP outside South Africa

Monitoring of IPTp-Sp effectiveness and safety of multiple doses is essential and should be continued.

Up until 2007, giving chloroquine to prevent the malaria in pregnancy was in the guideline of India, it was dropped in 2008. Government of India guideline 2010 mention use of insecticide treated nets as preferred preventive measure of malaria in pregnancy in India.

Using SP for prophylaxis is considered not to be appropriate for India because the epedemiolology of malaria is very different and drug resistance is observed in North eastern states of India.[15]

Malaria vaccine

Malaria vaccine continues to be a prospective future intervention needed to control malaria. Selective anti-malarial vaccines that are under different phases of trial.

Selective malaria vaccines under various stages o trial are as follows

Stages	Target stage	Antigen	Candidate vaccine
Pre-erythrocytic stage	Sporozoite	Circum sporozoite protein	RTS, S
	Hepatocyte	Circum sporozoite protein	ADHU 35
Erythrocyte	Merozoites	AMA -1	AMA1-AS02
	Merozoites	MSP-1	MSP-1
Multiple stages	Sporozoite Hepatocytes Merozoites	FP9/MVA Polyprotein	Six antigen

There are currently no licensed vaccines against malaria or any other human parasite. The research vaccine against P. falciparum, RTS, S/AS01, is most advanced. This vaccine is currently being evaluated in a large clinical trial in 7 countries in Africa. A WHO recommendation for use will depend on the final results from the large clinical trial. These final results are expected in late 2014, and a recommendation as to whether or not this vaccine should be added to existing malaria control tools is expected in 2015.[16]

Future prospects in the control of malaria include replacing the existing mosquitoes with malaria proof strains.

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Cultivate detachment. Anything you get attached to will only hold back the natural flow of your life

Urinary Tract Infections in Pregnancy

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INVITED ARTICLE

UTIs account for approximately 10 percent of office visits by women, and 15 percent of women will have a UTI at some time during their life. In pregnant women, the incidence of UTI can be as high as 8 percent.[1,2]

UTI is defined as the presence of at least 100,000 organisms per milliliter of urine in an asymptomatic patient, or as more than 100 organisms/mL of urine with accompanying pyuria (> 7 white blood cells [WBCs]/mL) in a symptomatic patient. A diagnosis of UTI should be supported by a positive culture for auropathogen, particularly in patients with vague symptoms.

Urinary tract infections (UTIs) occur commonly during pregnancy. UTIs include asymptomatic bacteriuria, acute cystitis, and pyelonephritis.

Pathogenesis

Infections result from ascending colonization of the urinary tract, primarily by existing vaginal, perineal, and fecal flora. Beginning in week 6 and peaking during weeks 22 to 24, approximately 90 percent of pregnant women develop ureteral dilatation, which will remain until delivery (hydronephrosis of pregnancy). Increased bladder volume and decreased bladder tone, along with decreased ureteral tone, contribute to increased urinary stasis and ureterovesical reflux.[1] Additionally, the physiologic increase in plasma volume during pregnancy decreases urine concentration. Up to 70 percent of pregnant women develop glycosuria, which encourages bacterial growth in the urine. Increases in urinary progestins and estrogens may lead to a decreased ability of the lower urinary tract to resist invading bacteria. This decreased ability may be caused by decreased ureteral tone or possibly by allowing some strains of bacteria to selectively grow.[1,3] These changes, along with an already short urethra (approximately 3-4 cm in females) and difficulty with hygiene due to a distended pregnant belly, increase the frequency of urinary tract infections (UTIs) in pregnant women.

Bacteriology

E coli is the most common cause, accounting for approximately 80-90% of cases. It originates from fecal flora colonizing the periurethral area, causing an ascending infection. Other pathogens include *Klebsiellapneumoniae* (5%), *Proteus mirabilis* (5%), *Enterobacter* species (3%), *Staphylococcus saprophyticus* (2%), Group B beta-hemolytic*Streptococcus* (GBS; 1%), *Proteus* species (2%), etc.

GBS colonization has important implications during pregnancy. Intrapartum transmission that leads to neonatal GBS infection can cause pneumonia, meningitis, sepsis, and death. Infection with *S saprophyticus,* an aggressive community-acquired organism, can cause upper urinary tract disease, and this infection is more likely to be persistent or recurrent.

Urea-splitting bacteria, including *Proteus, Klebsiella, Pseudomonas,* and coagulase-negative *Staphylococcus,* alkalinize the urine and may be associated with struvite stones. Chlamydial infections are associated with sterile pyuria and account for more than 30% of atypical pathogens.

Asymptomatic bacteriuria-

Asymptomatic bacteriuria is commonly defined as the presence of more than 100,000 organisms/mL in 2 consecutive urine samples in the absence of declared symptoms. Untreated asymptomatic bacteriuria is a risk factor for acute cystitis (40%) and pyelonephritis (25-30%) in pregnancy. Incidence of asymptomatic bacteriuria during pregnancy ranges from 2–10 %.Risk factors include: age (1% increase/decade of life), parity, sexual activity, h/o chlamydia infection, lower socioeconomic status, history of recurrent UTI, DM, sickle cell disease (renal damage), anatomic or functional GU abnormalities. Thus, routine screening for bacteriuria is advocated

Screening

The American College of Obstetrics and Gynecology recommends that a urine culture be obtained at the first prenatal visit.[5] A repeat urine culture should be obtained during the third trimester, because the urine of treated patients may not remain sterile for the entire pregnancy.[5] The recommendation of the U.S. Preventative Services Task Force is to obtain a urine culture between 12 and 16 weeks of gestation (an "A" recommendation).[6]

In randomized controlled trials, treatment of pregnant women with asymptomatic bacteriuria has been shown to decrease the incidence of preterm birth and low-birth-weight infants.[7]

Rouse and colleagues[8] performed a cost-benefit analysis of screening for bacteriuria in pregnant women versus inpatient treatment of pyelonephritis and found a substantial decrease in overall cost with screening.

Urine Culture

The gold standard for detection of bacteriuria is urine culture, but this test is costly and takes 24 to 48 hours to obtain results.A number of rapid tests have been evaluated against urine culture in test evaluation studies. These include :

- reagent strip tests which test for one or more of the following:
  - nitrite
  - protein
  - blood
  - leucocyte esterase
- microscopic urinalysis
- Gram stain with or without centrifugation
- urinary interleukin
- rapid enzymatic screening test (detection of catalase activity)
- bioluminescence assay.

The increased number of false negatives and the relatively poor predictive value of a positive test make the faster methods less useful; therefore, a urine culture should be routinely obtained in pregnant women to screen for bacteriuria at the first prenatal visit and during the third trimester.[5,6]

Urine specimen collection

For urine collection, a midstream clean catch is adequate, provided that the patient is given careful instructions. If the patient is unable to void, too ill, extremely obese, or bedridden, a catheterized specimen should be collected. Routine catheterization is not recommended, because of the risks of introducing bacteria into the urinary tract. The specimen should be sent for evaluation as soon as possible. Specimens that are allowed to sit at room temperature may have falsely elevated colony counts. Refrigerate the specimen at 4°C if it cannot be transported immediately

Treatment of ASB- All pregnant women should be treated when bacteriuria is identified.

Behavioral methods

- Avoid frequent baths
- Wipe front-to-back after urinating or defecating
- Wash hands before and after using the toilet
- Clean the perineum with water only
- Use liquid soap to prevent colonization from bar soap

Antibiotic therapy : Appropriate oral antibiotic regimens include the following :

- Cephalexin 500 mg 4 times daily

- Ampicillin 500 mg 4 times daily
- Nitrofurantoin 100 mg twice daily
- Sulfisoxazole 1 g 4 times daily

Ampicillin resistance is found in 20 to 30 percent of *E. coli* cultured from urine in the out-patient setting.[9] Nitrofurantoin (Macrodantin) is a good choice because of its high urinary concentration. Alternatively, cephalosporins are well tolerated and adequately treat the important organisms. Fosfomycin (Monurol) is a new antibiotic that is taken as a single dose (3 gm). Sulfonamides can be taken during the first and second trimesters but, during the third trimester, the use of sulfonamides carries a risk that the infant will develop kernicterus, especially preterm infants.

All antibiotics should be given for 7-10days to ensure cure. A recent study found that a one day course of nitrofurantoin is less effective than a seven day course for treating asymptomatic bacteriuria in pregnant women.[10] A repeat culture one to two weeks after completing therapy is required to ensure eradication of bacteriuria.

Acute cystitis

Acute cystitis involves only the lower urinary tract; it is characterized by inflammation of the bladder as a result of bacterial or nonbacterial causes (eg, radiation or viral infection). Acute cystitis develops in approximately 1% of pregnant patients, of whom 60% have a negative result on initial screening. Signs and symptoms include hematuria, dysuria, suprapubic discomfort, frequency, urgency, and nocturia without evidence of systemic illness. These symptoms are often difficult to distinguish from those due to pregnancy itself.

Acute cystitis is complicated by upper urinary tract disease (ie, pyelonephritis) in 15-50% of cases.

A urine sample should be sent for culture and, in the case of a pregnant woman, empiric treatment is required while waiting for the results. Antibiotic choice should cover common pathogens and can be changed if required after the organism is identified and sensitivities are determined.

A seven day treatment period is required to ensure eradication. Recurrent infections may have serious consequences for pregnant women therefore a longer course of antibiotics is used to avoid the higher rate of relapse with short courses.[11]A follow up urine culture can be requested one to two weeks after the antibiotic course has been completed to ensure eradication. Paracetamol can be used to relieve pain associated with acute cystitis.[12]

Acute Pyelonephritis

Pyelonephritis occurs in 2 percent of pregnant women,most often in the 2nd and 3rd trimesters; up to 23 percent of these women have a recurrence during the same pregnancy.[13]A diagnosis should be considered if presence of bacteriuria is accompanied by systemic symptoms or signs such as fever (> 38°C), shaking chills,flank pain ,CVA tenderness and nausea or vomiting. Symptoms of lower UTI such as frequency and dysuria may or may not be present.[11]

Pyelonephritis in pregnancy can have serious consequences such as maternal sepsis, pre-term labour and premature delivery and requires prompt and aggressive treatment.[11] Hospitalization is generally considered standard of care, although outpatient management may be considered in reliable, healthy patients less the 24 weeks GA with strict follow up (cover with IM ceftriaxone x 2 doses 24 hrs apart). IV hydration and parenteral antibiotics are indicated for at least 24 hrs. Further support for outpatient therapy is provided in a randomized clinical trial that compared standard inpatient, intravenous treatment to outpatient treatment with intramuscular ceftriaxone (Rocephin) plus oral cephalexin.[14] Response to antibiotic therapy in each group was similar, with no evident differences in the number of recurrent infections or preterm deliveries.

Antibiotic therapy may be initiated before obtaining the results of urine culture and sensitivity. Common regimens include cefazolin +/-gentamicin, cefuroxime or ceftriaxone. Intravenous antibiotics are usually continued until the patient has been afebrile for 48

hours. Oral antibiotics are then used for 10–14 days.[15]

If fever continues or other signs of systemic illness remain after appropriate antibiotic therapy, the possibility of a structural or anatomic abnormality should be investigated. Persistent infection may be caused by urolithiasis, which occurs in one of 1,500 pregnancies,[16] or less commonly, congenital renal abnormalities or a perinephric abscess.Diagnostic tests may include renal ultrasonography or an abbreviated intravenous pyelogram

Recurrence and Prophylaxis

UTIs recur in approximately 4 to 5 percent of pregnancies, and the risk of developing pyelonephritis is the same as the risk with primary UTIs. A single, postcoital dose or daily suppression with cephalexin(250mg) or nitrofurantoin(100mg) in patients with recurrent UTIs is effective preventive therapy.[17] A postpartum urologic evaluation may be necessary in patients with recurrent infections because they are more likely to have structural abnormalities of the renal system.[13,16,18] Patients who are found to have urinary stones, who have more than one recurrent UTI or who have a recurrent UTI while on suppressive antibiotic therapy should undergo a postpartum evaluation.[16,18]

Complications

The primary complication of bacteriuria during pregnancy is cystitis, though the primary morbidity is due to pyelonephritis. Other complications may include :

- Perinephric cellulitis and abscess
- Septic shock (rare)
- Renal dysfunction (usually transient, but as many as 25% of pregnant women with pyelonephritis have a decreased glomerular filtration rate)
- Hematologic dysfunction
- Hypoxic fetal events due to maternal complications of infection that lead to hypoperfusion of the placenta
- Premature delivery leading to increased infant morbidity and mortality
- Approximately 2% of women with severe pyelonephritis during pregnancy have evidence of pulmonary injury due to systemic inflammatory response syndrome and respiratory insufficiency. Endotoxins that alter alveolar-capillary membrane permeability are produced; subsequently, pulmonary edema and acute respiratory distress syndrome develop.

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Dr. Anjali Deshpande

Hepatitis in Pregnancy

Acute viral hepatitis is the most common liver disease and most common cause of jaundice in pregnancy. The important risk in many types of hepatitis is vertical transmission to newborn.

Jaundice is a characteristic feature of liver involvement. The clinical signs and symptoms of various types of viral hepatitis are more and less same but the laboratory virus testing and Liver function tests differentiate the conditions.[1]

The hepatitis is caused by hepatitis viruses A, B, C, D, E, and G.

Liver function tests used areurine bilirubin and urobilinogen, total and direct serum bilirubin, alanine aminotransferase (ALT) and/or aspartate aminotransferase (AST), alkaline phosphatase (ALP), prothrombin time (PT), total protein, albumin, complete blood cell (CBC) count, and in severe cases, serum ammonia testing[2]

Hepatitis A

Hepatitis A virus (HAV) infection is the most common form of viral hepatitis. HAV is a small, non enveloped, single-stranded RNA virus and classified within the genus Hepatovirus of the picornavirus family.[3] HAV is an icosahedral capsid, 27 nanometers in diameter. HAV is spread by ingestion of contaminated water and food and is shed in stool for 2to 3 weeks before and one week after the onset of jaundice. This virus is transmitted by the fecal-oral route.[2] The incidence of acute HAV infection in pregnancy is approximately 1:1000 women. Outbreak occur in the areas of poor sanitation and overcrowded population. Infected workers in the food industry may also be source of outbreak. The feces contain highest concentration of HAV viral particle & it is highest in late incubation period and early prodromal period. HAV is not shed in other body fluids in significant number. The viremia is also transient so blood born transmission is rare. Vertical transmission of HAV during the pregnancy or puerperium is rare.[4,5]

Pathophysiology and transmission

HAV replicates exclusively in the cytoplasm of the infected hepatocytes by a mechanism involving an RNA-dependent RNA polymerase.[3,5] The inflammation and necrosis of liver is because of immune cell response. The resulting inflammatory response leads to hepatitis and necrosis and appears to be T-cell mediated. The process is reversible with restoration occurs within 8-12 weeks In pregnancy, there is no maternal-fetal transmission of HAV, as anti-HAV immunoglobulin (Ig) G antibodies formed as response cross the placenta and provide protection to the infant.

Serology

IgM immunoglobulin M appears in blood at the onset of symptoms. It is a marker for acute infection. As IgM titer rises fecal shedding of virus ends. IgM response becomes low after few months and then IgG anti HAV starts appearing and it persist for years together providing lifelong immunity and protection.

Clinical management

There is no value of Antibiotics in the treatment of HAV infection.

Also antiviral agents, corticosteroids, have no effect in the management of the acute disease. The administration of immunoglobulins may help in chronic case.

Majority of patients are treated on outpatient basis.

In acute phase patient needs hospitalization for fever, malaise, vomiting, weakness and abdominal pain. Supportive therapy is for maintaining adequate fluid and nutritional balance. There are no specific restrictions on diet.

Complications like hepatic encephalopathy, coagulopathy are associated with significant maternal and fetal morbidity.

Antenatal care remains same. Acute HAV infection may cause preterm labour. In cases of coagulopathy there is risk of PPH. Breast feeding is not a contraindication in HAV infection.

Prognosis

HAV infection does not lead to chronic or persistent hepatitis. Fatality rate is very low 0.1%.

Maternal mortality is seen in cases of massive necrosis of the liver, Encephalopathy, coagulopathy.

In the preexisting Hepatis B infection, mortality is more.

Patient education and prevention

Prevention of HAV transmission is done by good hygiene, clean water supply, avoidance of food contamination, vaccination.

Preexposure vaccination - Inactivated HAV vaccine is safe in pregnancy. Post exposure immunoglobulin should be given within 2 weeks of exposure to reduce severity of disease. Immunoglobulin is also safe in pregnancy. A single intramuscular dose of 0.02 mg/mL given within 2 weeks of exposure provides protection for 3 months in 80-90% of individuals.[20]

Hepatitis B

Hepatitis B disease is caused by HBV, an enveloped partially double-stranded, circular DNA genome and from the family hepadnavirus. The core is surrounded by a lipoprotein coat or envelope, which is the HbsAg.[6] The envelope lipoprotein, is produced in excessive amounts and released into the circulation as HBsAg

The average incubation period is 90 days from time of exposure to onset of symptoms, but may vary from 6 weeks to 6 months

HBV interferes with the functions of the liver during the replication in liver cells.

HBV does not cross the placenta because of its size, and it cannot infect the fetus unless there have been breaks in the maternal-fetal barrier. Perinatal transmission from the mother to baby during labour is important mode of transmission. If a pregnant woman is an HBV carrier and is also positive for hepatitis B "e" antigen (HBeAg), her newborn baby has a 90% likelihood of becoming infected. Most HbsAg carriers are asymptomatic but potentially infectious.[6]

Patient develops jaundice with loss of appetite, nausea, vomiting, fever, abdominal pain. Some may have dark urine and gray stool. About 1% of cases result in acute liver failure and death. Approximately 25% of infected infants will become chronic carriers.
Important, modes of HBV transmission is trough contact with infected blood, body fluids, and by sexual intercourse, use of infected needles or blood transfusion. A break in the skin or mucosal barrier is required for transmission.[6]

HBV infection is transient in about 90% of adults, approximately 5-10% of adults progress to become asymptomatic carriers and develop chronic hepatitis,cirrhosis and risk ofhepatocellular carcinoma.[6]

Infectivity

The concentration of HBV is high in blood, wound discharge, semen, vaginal discharge, and saliva.

The virus is minimally detected in urine, feces, sweat, tears, and breast milk.

Lab diagnosis :

1) Surface antigen and antibodies (HBsAg and anti-HBs, respectively) the presence of HBsAg indicates that the woman is potentially infectious
2) Core antigen and antibodies (HBcAg and anti-

HBc, respectively)

3) HBeAg antibody detection indicative of infectivity and disease severity.

The risk of maternal-fetal transmission can be as high as 90% among women positive for HBsAg who are also positive for HBeAg.

Anti-HBc is first antibody to appear & diagnose acute HBV infection. Patients of hepatitis B should be tested for hepatitis D virus (HDV), HCV and HIV infections.

Chronic HBV infection lasts for more than 6 months, with persistently positive HbsAg and anti-HBc IgG with absence of an anti-HBs response.

HBeAg is often present and correlates with elevated levels of HBV DNA. After liver becomes cirrhotic, ALT concentrations decreases but there is rise in serum transaminases, bilirubin, antinuclear (ANA), antimitochondrial (AMA).

Clinical management

Antenatal care remains same with 2 doses of Tetanus toxide and iron, folic acid and calcium supplementation.

Treatment with antiviral is recommended for patients with HBV DNA levels persistently greater than 10,000 copies/mL[35] antiviral are notteratogens but informationis limitedduring pregnancy.[36] Lamivudine has been used in the second trimester in attempt to prevent perinatal transmission of hepatitis B virus infection with mixed success

- Avoid hepatotoxic drugs such as acetaminophen worsens liver damage.
- Avoid alcohol.
- Not to share toothbrushes and razors.
- Inform the health professionals about status hepatitis B carrier.
- Baby should be given hepatitis B vaccine at birth, one month, and six months of age as well as H-BIG at birth.
- Discuss the risk for transmission with their partner.
- Liver function testing is recommended for women who are HbsAg positive.

Intrapartum Management

Standard precautions with blood and body secretions should be implemented.

Avoid the use of fetal scalp electrodes during fetal monitoring. Avoid fetal blood sampling

Mode of Delivery

Vaginal delivery with universal precautions is preferred. Caesarean section is indicated for obstetric indications.

Postpartum Management

Instruct the woman to take standard precautions for blood and body secretions.

Breastfeeding

There is no evidence that breastfeeding increases the risk of HBV transmission provided the neonate receives HBV

All women with hepatitis B are encouraged to breastfeed their babies.

Advise HBV carrier women not to participate in breast milk donation.[7]

Breastfeeding is not recommended with some medications used in HBV treatments e.g.

Lamivudine.

Prevention

Pregnancy is not a contraindication to vaccination.

For vaccination of adults : 1-mL dose by intramuscular injection into the deltoid muscle, at initial visit, then one month and six months after the first dose, for a total of three doses.

Preexposure prophylaxis

Preexposure immunization by hepatitis B vaccine is recommended for high-risk individuals & health care professionals & workers.

Post exposure prophylaxis

Post exposure immunization with hepatitis immunoglobulin HBIG for babies of HBsAg positive as there is risk of becoming chronic carriers is high 90%.

If HBIG is given within 24 hours after birth, the risk of HBV infection can be reduced to 20%.

HBIG plus HBV vaccine administered within 24 hours after birth, HBIG and vaccination are 85-95% effective in preventing HBV infection and the chronic carrier state.

Newborn child must be given first dose of hepatitis B vaccine and one dose of hepatitis B immune globulin (HBIG), within the first 12 hours of life and additional doses of hepatitis B vaccine at one and six months of age to provide complete protection.

Household contacts, siblings and husband should be screened for HBV infection and vaccination is advised

Hepatitis C

Infection by Hepatitis C causes chronic hepatitis, cirrhosis, and hepatocellular carcinoma (HCC) .Approximately 75% of patients are chronically infected and asymptomatic and responsible for transmission. 40% of infected patients recover completely and 20% of the carriers develop cirrhosis, and out of these 20% develop liver cancer. [7,8]

Transmission is by IV drug use, sexual transmission, blood transfusion. Acute HCV infection leads to symptomatic hepatitis in 20-30% of patients. In pregnancy the prevalence of HCV is estimated to be about 1%, highest amongst black.[9]

Pathophysiology and transmission

HCV is a partially double-stranded RNA virus, mutates frequently secondary to changes in structural proteins of the viral envelope. Antibodies against HCV do not produce immunity against the disease.

Maternal-fetal transmission

Transfer of HCV infection in pregnancy occurs as a result of vertical or horizontal transfer. The prevalence of HCV among pregnant women is approximately 1% & mother-to-infant transmission is 4-7%. Transfer of HCV infection to female infants may be twice than to male infants.[11]

Perinatal transfer could potentially occur before or during delivery& depends on viral load more 100,000 copies/mL is associated with an increased risk.

Approximately 25% of people who contract HCV are able to clear the virus naturally within 12 months without developing any immunity.

Factors which increase risk for vertical transmission of HCV include co-infection with HIV, rupture of membranes for more than 6 hours, and higher viral load.

Antenatal Management Screening For Hcv

All antenatal women should be subjected for HCV status.

The initial screening test assesses for the presence of antibodies to HCV

Polymerase Chain Reaction (PCR) should be advised to detect the presence of the virus in the blood, the viral load, and the genotype of virus.
Liver function tests (LFTs) should be performed ..

Intrapartummanagement

Standard precautionsshould be implemented for all women during delivery.

Avoid procedures that may increase risk of vertical transmission of HCV.

Postnatal Management

Encourage women to have immunization for Hepatitis A and B.

Encourage breast feeding:

Planned cesarean section is preferred to prevent maternal-fetal transmission by up to 60%.[12]

HCV RNA can be very unreliable for up to 1 year after infection due to fluctuations concentration, measuring HCV antibodies and serum transaminases concentration at baseline& the nat 0,1,3, and 6 months after exposure.

The most widely used form of treatment is a combination of pegylated interferon (PEG-IFN) and ribavirin to suppress viral replication in more than 50% of cases but in pregnancy it is contraindicated due to IUGR and IUFD

Hepatitis D

Hepatitis D is caused by hepatitis delta virus (HDV), a defective RNA virus infects preexisting HBV.

HDV infection is transmitted by contact with infected blood or blood products, drug users or sexual contact & rarely perinatal transmission.

Diagnostic studies

HBsAg positive

Anti-HDAg antibodies

Alanine aminotransferase (ALT) and aspartate aminotransferase (AST) are elevated,

Clinical management and prognosis

No antiviral therapy is effective against acute or chronic HDV infection.

Hepatitis E

Hepatitis E is caused by the hepatitis E virus (HEV).

HEV is transmitted by fecal–oral route due to contaminated water. The infection is mild and self-limited.

HEV infection is usually mild to moderate in severity, with a mortality of 0.4-4%.

Pregnant patients have a more severe illness due to attenuated cellular immunity causes fulminant hepatitis with mortality up to 20% with high risk of neonatal mortality.[13]

Pathophysiology and transmission

HEV is excreted from the liver via the common bile duct into the duodenum of the small intestine, viral shedding in feces occurs during the incubation and early acute phase.

The period of infectivity extends for up to 14 days after the onset of jaundice. There is no sexual transmission

Diagnostic studies

Presence of IgM anti-HEV.

Clinical management and prognosis

Most HEV infections are self-limited except in pregnancy. During pregnancy maternal mortality occurs in 20% of patients & PNM up to 33%.

Hepatitis G

In 1966, the GB virus (GBV) was identified in a young surgeon named G. Barker.

3 related viral genomes: GBV-A, -B, and -C.

GBV-C **was** the virus identified as the hepatitis G virus (HGV) and capable of replicating in humans.

HGV infection is seen in co infection with hepatitis C virus (HCV).

Pathophysiology and transmission

HGV has been detected in hepatocytes, peripheral blood lymphocytes and monocytes, vascular endothelial cells, and other tissues[14]

Most cases of HGV infection are transferred through contaminated blood products.

Perinatal transmission.

Several factors appear to influence maternal-infant viral transmission. These include maternal viral count and co infection with HCV or HIV. The rate of maternal-infant transmission is approximately 75-80%.[14]

Diagnostic studies

The basic marker for HGV diagnosis is RNA detectable by real-time–polymerase chain reaction (RT-PCR) amplification

Management and prevention

In general, most patients remain asymptomatic and do not require specific treatment. HGV is a parenterally transmitted infection. Cases of acute post transfusion hepatitis have been reported with increased aminotransferase levels, positive HGV RNA. Pooled blood products are common source of infection.

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Maturity means taking responsibility for our own happiness and choosing on concentration what we have got, rather than on what we have not.

Tuberculosis in Pregnancy

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Introduction

Mycobacterium tuberculosis infects about 32% of the World's population. Tuberculosis has been a major cause of illness and death worldwide for ages and still continues to be so as a major health problem. In 2011, there were an estimated 8.7 million new cases of TB (13% co-infected with HIV) and 1.4 million people died from the disease. TB is one of the top killers of women, with 500 000 deaths annually.[1] The greatest disease burden is during the child bearing years, that is between 15-49 years with 80% of all deaths from TB occurring in this age group. India is one of the highest TB burden countries of the world and it accounts for one fifth of the diseased population. (Fig I) Though it mostly affects the lungs, it can affect all the organs of the body including Genital Organs. (Fig II)

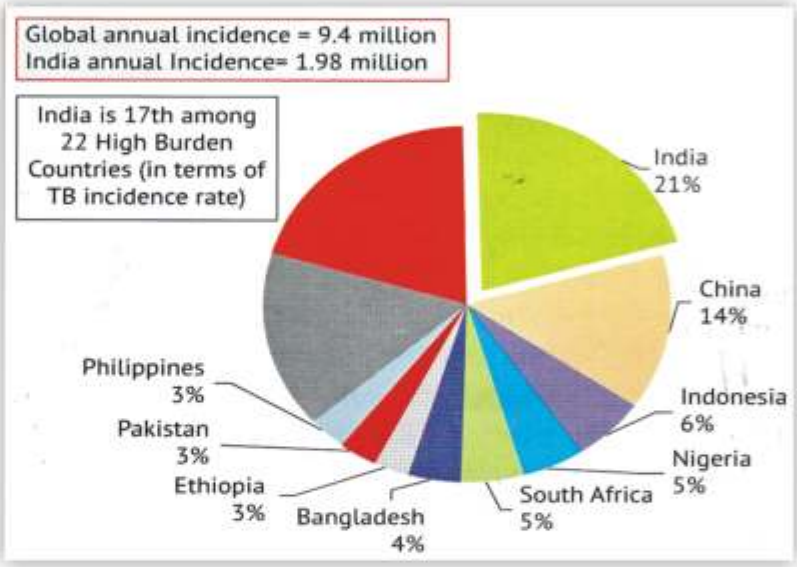

Fig. I : World's TB Burden WHO data, 2009.[2]

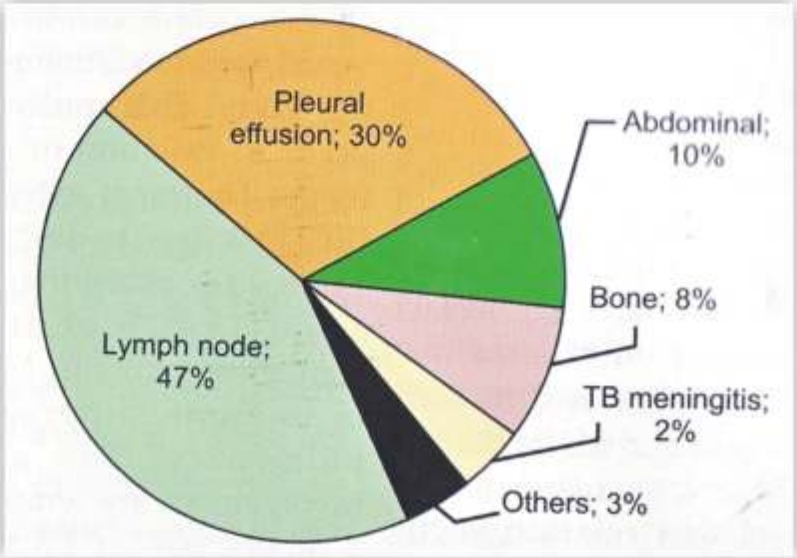

Fig. II - Shows the EPTB Incidences

Govt. of India, Ministry of Health and Family Welfare had issued a notification on7th May 2012 stating that all health care providers shall notify every TB case to local authorities ie DHO/CMO/Municipal health officer of Municipal Corporation/Municipality every month in a given format with immediate effect.

Very few studies are there about the incidence of tuberculosis in pregnant women. The prevalence rate in pregnant population varies between 2 to 5%. And it is not much different from the general population of that country. (Table I)[3,4,5,6,7,8,9]

Table I - Prevalence of tuberculosis in pregnancy

Authors	year	%
Browne and Browne	1960	1
Deshmukh et al (3)	1964 (Bombay, India)	5
Sikand (4)	1964 (Delhi, India)	2
Schaeffer (2)	1975	2
Tripathy and Tripathy (5)	1993 (Orissa, India)	2
Kothari A, et al	2006 (UK)	.25
CDC American white	1987, Atlanta, America	.006
American Africans		.03
American Asians		.05

Though tuberculosis is a prehistoric disease, it is no older than pregnancy. Over the millenniums, investigators have studied the interaction between the two, and in myriad of ways how the two interact, has been examined extensively. Hippocrates (10) believed in the beneficial effects of tuberculosis on pregnancy. This view continued over the years. Galen and other early and middle age scientists believed in it. In the mid 19th century, a diametrically opposing view emerged.[11,12,13]. leading to the development of the dictum .'For the virgin no marriage, for the married no pregnancy, for the pregnant no confinement and for the mother no suckling. Abortion was considered a viable option.[14]

However, this opposite view soon began to unravel, as new studies started confirming the views of previous scientists. Even before the advent of medications to treat tuberculosis, evidence accumulated suggesting that tuberculosis did not worsen the outcome of pregnancy. In 1943, Cohen[15] opined, that pregnancy do not increase the tuberculous infection. Hadvell (16) in his study of 250 pregnant women with radiographic evidence of tuberculosis noted that 9% improved, 7% worsened and 84% remained unchanged during pregnancy. Stewart and Simmonds found no difference in the 5 year tuberculosis survival rates of women who were pregnant versus those who were not pregnant.[17] Crombe[18] reported an increased relapse rate. Abortion, stillbirth, premature delivery, congenital tuberculosis and excessive PPH were not uncommon in the pre chemotherapy era. But today with good chemotherapy, none of the above is seen in increased numbers compared to non-tuberculosis pregnant women.

Effects of Pregnancy on tuberculosis

Child bearing, more so child rearing had adverse effects on the course, prognosis and relapse of tuberculosis in pre chemotherapy era.

But presently with good chemotherapy, there is no differences between a pregnant woman and a non pregnant woman, as regards the course, prognosis and relapse of tuberculosis. From different studies and from our study, it is conclusively proved that, if the patient. takes adequate treatment for tuberculosis, pregnancy does not predispose the patients to a greater risk than the non pregnant population. The relapse rate is not increased even if they become pregnant for 3 to 4 times.[6]

Effects of Tuberculosis on pregnancy

Similarly tuberculosis also do not have a deleterious effect on the outcome of pregnancy if treated early There are no statistical difference in duration of gestation, preterm labour, and other complication of pregnancy labour and puerperium between the control and treated group.[6, 19,20,21]. There is also no increased risk of congenital anomalies in the treated group. However, the effects depends on so many factors like stage of pregnancy when management starts, nutritional status of mother, presence of concomitant disease, immune status and co existence of HIV infection, availability of facilities for early diagnosis and treatment and the primary site of the tuberculosis. The results are good with pulmonary

tuberculosis. Among the extra pulmonary tuberculosis, lymphadenitis is the most common form and has no adverse effect on the maternal and foetal outcome. The adverse perinatal outcomes are more pronounced in women with advanced disease, late diagnosis, and incomplete or irregular drug treatment Intestinal, spinal, genital and meningeal tuberculosis are associated with an increased frequency of maternal disability, fetal growth retardation and infants with low Apgar scores.[22, 23] Jana et al in an extensive non randomized review expressed the same view though they highlighted the difficulties of diagnosing tuberculosis during pregnancy more so regarding the extra pulmonary tuberculosis. They concluded, as active TB poses grave maternal and perinatal risks, early, appropriate and adequate anti-TB treatment is a mainstay for successful pregnancy outcome. The current knowledge gaps in perinatal implications of maternal TB can be addressed by a multicenter comparative cohort study.[24]

Clinical presentation

Similar symptoms and signs between TB and pregnancy like tachycardia, anemia, raised ESR and low serum albumin level, as well as dissimilar parameters (like increase in weight during pregnancy and decrease due to TB, hypertension in the former and hypotension in the latter etc) confuse the clinical presentation of tuberculosis in pregnancy. But, usually, the clinical presentation of tuberculosis in the pregnant women is similar to that in the non-pregnant patients. Cough, weight loss, fever, fatigue and hemoptysis are the usual features, but may be asymptomatic in up to 20% of women. Other features like lethargy, abdominal distension, and irritability and skin lesions may also be seen. Extra pulmonary tuberculosis is also fairly common and has been observed in 20% of cases. Lymphadenitis is the most common form of extra pulmonary tuberculosis. Other forms of extra pulmonary tuberculosis such as intestinal, spinal and meningeal tuberculosis are associated with an increased frequency of maternal disability, fetal growth retardation and infants with low Apgar scores. Patients co infected with HIV have a greater incidence of extra pulmonary tuberculosis. Multi drug resistant tuberculosis (MDR-TB) should be as common during pregnancy as in the non-pregnant patients, although this is not documented. However pregnant mothers with MDR TB have increased risk of maternal and neonatal complications.

Screening

As usual screening for tuberculosis is done by Monteux test and the interpretation is done by CDC guidelines PPD Size more or 5 mm is considered positive in patients with known or suspected HIV infection, recent close contacts with an active case, clinical or radiographic evidence of tuberculosis. More or 10 mm is taken as positive in intravenous drug abusers, Residents of health care institutions, shelters, and prisons, health care workers, immigrants from high prevalence countries, diabetes mellitus, renal failure patients, of postgastrectomy or intestinal bypass patients, certain hematologic and reticulo endothelial diseases, immuno suppressed patients, silicosis patients, malnourished patients and chronic alcoholics More or 15 mm is considered positive in all low risk patients.

The recent two tests for screening are T-SPOT- TB Test and QuantiFERON - TB Gold Test. They are serological tests. Both use ESAT–6 and CFP 10 antigen, the tests substrate is whole blood in quantiFERON Gold and PBMC (Peripheral blood mononuclear cells) in T-SPOT- TB Test, the outcome measure being serum concentration of IFN_Gamma produced by T cells in the former and number of IFN Gamma producing T cells in the latter. They came with big promise, but could not deliver. IGRAs are more costly and technically complex to do than the TST. Given comparable performance but increased cost, replacing the TST by IGRAs, as a public health intervention in resource-constrained settings, is not recommended by WHO since 2011.

Diagnosis

High degree of suspicion completed with relevant investigations are necessary for correct diagnosis. If the PPD is positive (Fig III), a careful history should be taken focusing on signs and symptoms of tuberculosis, any past or present contacts, history of a negative PPD

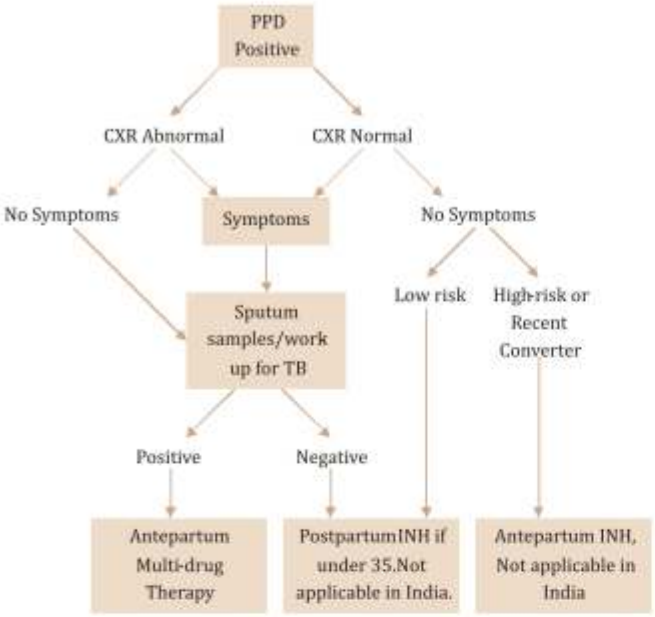

Fig. III - Algorithm for investigation and treatment of tuberculosis.

in the past 2 years, and risk factors for immuno suppression. If there are no symptoms suspicious for active TB and no evidence of immunosuppression, a shielded chest radiograph (CXR) can be done in the second trimester. If symptoms or immunosuppression are present, a shielded CXR should be done immediately, even in the first trimester.

If the CXR is read as suspicious or positive for active TB, two sputum samples must be collected on two separate occasions to send for smear and culture to identify acid fast bacilli Histopathological examination of biopsy material also clinches the diagnosis. FNAC/FNAB, also helps in diagnosis, but negative findings do not exclude tuberculosis.

Management

Treatment must be multi disciplinary, which consists of a chest physician, general practitioner, pediatricians, health visitors, social workers, and of course the gynecologist and obstetrician. The ideal time to give advice concerning the risk and benefit of drug use during pregnancy is at a preconception counseling clinic. But unfortunately most requests for information come after the pregnancy has began, usually after the exposure has occurred.

Treatment is usually chemotherapy. Short course chemotherapy is the treatment of choice. The 2 EHRZ, 4 HR or 2EHR, 7 HR regimens, with variations here and there are used. (Table II)

Table II - WHO, Recommended doses

Drugs	Daily doses (mg/kg)	Route	Thrice weekly dosage (mg/kg/dose
Isoniazid(H)	5 (4-6)	Oral	10 (8-12)
Rifampicin®	10 (8-12)	Oral	10 (8-12)
Pyrizinamide(Z)	25 (25-30)	Oral	35 (30-40)
Ethambutol(E)	15 (15-20)	Oral	30 (25-35)
Streptomycin(S)	15 (12-18)	IM	15 (12-18)

Revised National TB Control Programme (RNTCP) and Directly Observed Treatment, Short Course (DOTS)-

The concept of directly observed therapy has been known for many years. Hospitalization for part or whole course of chemotherapy is one of giving supervised chemotherapy. It is neither practical nor feasible. Higher dose SCC intermittent therapy given in thrice weekly (2 E3H3R3Z3, 4H3R3) is given as now been advocated by WHO. This is called DOTS. The patient takes the drugs under the supervision of a health worker. This ensures the regularity of consumption of drugs.

We personally do not advocate DOTS regimen of RNTCP, because if the patients misses one dose of the regimen, it will be more harmful than a single day regimen missing one dose, as it is very difficult to diagnose as well as monitor a case of MDR tuberculosis. WHO is going to implement daily DOTS regimen very soon. (Table No. II)

Pulmonary and extra pulmonary disease is treated with the same regimens. Some experts recommend 9-12 months of treatment for TB meningitis given the serious risk of disability and mortality and 9 months of treatment for TB bones or joints because of the difficulties in assessing treatment response. Unless drug resistance is suspected, adjuvant corticosteroid treatment is recommended for TB meningitis and pericarditis. (25, 26). Breastfeeding should be given. Risks of adverse effects to the newborn from the antituberculous drugs are minimized if the mother breastfeeds before taking the drugs, or expresses and

keeps the milk until needed. Breast milk contains low levels of pyridoxine and INH causes pyridoxine deficiency. Pyridoxine supplementation is recommended for all pregnant or breast feeding women taking isoniazid[27]. (Table No. III)

Table III - Effects of First line anti TB drugs on the fetus and newborn.

Drug	Teratogenic effects	Pregnancy data	Safety	Breast Feeding
Isoniazid.(H)	NIL	Present in fetal blood	Yes	Pyridoxine 10mg/day to decrease peripheral neuropathy, yes
Rifampicin(R)	NIL	Present in fetal blood	Yes	yes
Ethambutol(E)	NIL	-	Yes	Monthly visit for eye testing. Yes
Pyrizinamide(Z)	NIL	-	Yes	yes
Streptomycin(S)	Ototoxicity	Present in fetal blood	No	No

Follow Up

During treatment of patients with pulmonary TB, a sputum specimen for microscopic examination should be done at completion of the intensive phase of treatment. If smear positive at month 2, obtain sputum again in month three. If smear is positive at month 3, culture and DST(Drug susceptibility testing.) should be done. In extra pulmonary tuberculosis, clinical monitoring is the usual way of assessing the response to the treatment. As in the pulmonary smear negative disease, the weight of the patient is a useful indicator.[28] In addition, it is essential that patients have clinical evaluations at least monthly to identify possible adverse effects of the anti-tuberculosis medications and to assess adherence.

MDR Tuberculosis

Though the incidence of single and multiple drug resistant TB are increasing throughout the world, the real incidence of MDR tuberculosis in pregnancy is not known so also the effects of pregnancy on the disease and the vice versa. The literature available is very scanty and whatever is available they are case reports or study of few cases from which no definite conclusions can be drawn.

The general guidelines given in the programmatic management of drug resistant tuberculosis[29] are as follows. Pregnant patients should be carefully evaluated taking into account gestational age and severity of the DR-TB. The risks and benefits of treatment should be carefully considered, with the primary goal of smear conversion to protect the health of the mother and the child. When therapy is started, three or four oral drugs which are sensitive to the infecting strain should be used and then reinforced with an injectable agent and other drugs immediately post partum.

Formula food is preferred to breast feeding. Till the mother is sputum positive, the baby should be taken care of by others. Whenever the mother and child are together, they should be in a well ventilated room and the mother must use a mask.

In our opinion, the obstetrician should suggest for termination of pregnancy. If the patient still insists on continuing the pregnancy, all the risk and benefit of giving second line drugs to be explained to them and a written consent is taken from the patient that she wants to continue the pregnancy. 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 will be considered as XDR TB. It is obvious, in this type of tuberculosis, pregnancy is contraindicated, if it occurs, MTP is a must.

HIV, Pregnancy and Tuberculosis

Most of the data regarding the pulmonary complications of HIV infection come from studies in non-pregnant patients. Apart from routine antenatal tests, screening for other sexually transmitted

diseases should be done. As chest X-ray does not give a classical picture of pulmonary tuberculosis, the gold standard of diagnosis of pulmonary tuberculosis in HIV is sputum examination, that too repeatedly, as direct smears for AFB is often negative Extra pulmonary tuberculosis is much more common in HIV positive cases. No invasive procedure like cordocentesis etc should be done as it increases the vertical transmission rate. Hence a high degree of suspicion coupled with relevant investigation is necessary for correct diagnosis.[30,31,32,33]

As regards treatment, for tuberculosis, the short course chemotherapy like 2 EHRZ + 7HR to be given as soon as the disease is detected along with antiretroviral therapy, the regimen being AZT+3TC+NVP. Or TDF +33TC or FTC+NVP or triple NRTI regimen (AZT+3TC+ABC) or (AZT+3TC+TDF). (zidovudine (AZT) tenovr disoproxy fumarate (TDF) lamivudine (3TC) emtricitabine (FTC), nevirapine (NVP). Now NACO and RNTCP collaborating together to treat these cases.

Labor and delivery in Tuberculosis with Pregnancy

Close monitoring of labor and delivery should be done. Pulse and respiratory rate should be checked frequently. Prophylactic forceps or prophylactic vacuum delivery should be. done wherever necessary. LSCS is done for obstetrics reasons, not for tuberculosis.

The neonate

There is no statistically significant increase in congenital malformation in children born to mothers with tuberculosis. True congenital tuberculosis is rare, the risk to neonate being the acquisition of the same shortly after birth.[34] At times the fetus has multiple primary foci in the gut or the lungs. The criteria for diagnosis of congenital tuberculosis are lesions in the first week of life, primary hepatic complex or caseating hepatic granulomas and tuberculous infection of the placenta or the maternal genital tract[35], the overall mortality for congenital TB has been reported as 38% in the untreated and 22% in the treated. Delay in diagnosis contributes to high risk of mortality. As usual the treatment is chemotherapy for 6 months.

Conclusion

TB is treatable, preventable, and a curable disease, neither the diagnosis nor the management poses much of a challenge. However the challenge is still there. We are not able to control tuberculosis, though the tuberculosis control program has started from a long time.. The advent of HIV has a warning that the disease may reach epidemic proportions. In the new millennium, the vision of the Govt of India is a 'TB Free India ' Works are going on in this respect to achieve the goal by 2015. For patients with pregnancy having active tuberculosis, therapy should be initiated as soon as the diagnosis is established. irrespective of the duration of pregnancy, The treatment of choice is short course chemotherapy, 2 EHRZ+4HR in mg/kg body weight on daily regimen basis and preferably in fixed dose combinations.

Key Recommendations.

1. Tuberculosis affects one third of population of the world, India sharing 21% of the burden.
2. Number one infectious killer of women in child bearing group.
3. The whole of India is covered under RNTCP Programme.
4. Sero Diagnostic Test Kits are no longer used to diagnose tuberculosis. India banned test kits from 7-6-2012. This we were telling for the last 15 years, that it does not diagnose tuberculosis.
5. Though Tuberculosis and pregnancy share most of the symptoms, if a basic symptom of tuberculosis is taken into account it is not difficult to diagnose.
6. IGRA is not recommended for screening by WHO from 2011 in developing Counties.
7. The treatment of choice, Short course Chemotherapy daily under supervision. It is better to consult a chest physician.
8. If the disease is diagnosed early and treated early there are no adverse effects of tuberculosis on fetal and maternal outcome. Specially in

glandular and pulmonary Tuberculosis.

9. The first line drugs can be given in first trimester of pregnancy and while breast feeding except streptomycin.
10. HIV, Tuberculosis and pregnancy is a deadly combination. Now NACO and RNTCP are treating the cases together and the outcome is good.
11. In MDR Tuberculosis, second line drugs are used which are terratogenic. The best option is to terminate the pregnancy. But if the patient insists in continuation of pregnancy, then a written consent must be obtained. In XDR Tuberculosis with pregnancy, termination is a must.
12. Still Tuberculosis is a Social taboo. People do not want to disclose that they are suffering from tuberculosis, so also the pregnant women. A meticulous history taking is a must in a busy clinic which seems impossible.

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Whatever any one says or does means nothing about your worth as a human being.

HIV in Pregnancy

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Introduction

The biological & sociocultural reasons make women all over the world susceptible to infection by HIV. As the epidemic is rising, it is becoming an important cause of maternal mortality, but ***pregnancy does not have an adverse effect on the natural history of the course of the disease.***

HIV is a retrovirus containing reverse transcriptase. This enzyme allows the virus to transcribe its RNA genome into DNA, which then integrates into host cell DNA. It targets CD4 lymphocytes, causing progressive immunosuppression. ***When CD4 lymphocytes fall below a critical level, infected individuals become more susceptible to opportunistic infections and malignancies***. Transmission from mother to child (MTCT)can occur during pregnancy, delivery and breast feeding. **The MTCT rates vary from 15-20%.**

There are two types of HIV : 1 and 2. Both have different biological & molecular characteristics and geographical distribution. HIV 1is more common & prevalent. HIV2 is found in some parts of West Africa and has a slower course. This knowledge has led to the development of a number of new antiretroviral drugs and treatment protocols. The demonstration of efficacy of these drugs in containing viral replication has changed the world's outlook on HIV/AIDS from a ***"virtual death sentence***" to a "***chronic manageable disease***".

Treatment with a combination of three or more anti-retroviral drugs, known as ***highly activeanti-retroviral therapy (HAART),*** has resulted in adramatic decline in morbidity and an increase in life expectancy. The three classes of anti-retroviral drug most commonly used in pregnancy are nucleoside reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors and protease inhibitors.

The human immunodeficiency virus (HIV) epidemic continues to take a heavy toll on women and children worldwide. In 2008, 33.4 million individuals were living with HIV, of whom 15.7 million were women and 2.1 million were children under 15 years of age. Globally, HIV is the leading cause of death in women of reproductive age. The adult HIV prevalence in India has been estimated to be 0.31% (0.25–0.39%) in 2009. Since nearly all HIV infections in children are acquired from their mothers, the global epidemiology of HIV in children reflects that of HIV in women. Overall, about 15-20% of children who acquire HIV infection from their mothers are infected during the antenatal period, 50% during delivery and33% through breast feeding.[2]

Nearly all such infections can be prevented by PMTCT programmes providing highly effective ART and ARV prophylaxis interventions. With these interventions, the risk of MTCT can be reduced to less than 5% (or even lower) in breast feeding populations (from a background risk of 35%) and to less than 2% in non-breastfeeding populations (from a background risk of 25%). The use of single dose NVP, which is still being used in many settings, significantly reduces peripartum transmission but is associated with the acquisition of viral resistance and is much less effective than combination and longer ARV prophylaxis regimens. Moreover, this regimendoes not cover the breast feeding period.

INVITED ARTICLE

Management of HIV +Ve Pregnant Women

Screening : All pregnant women are recommended screening for HIV infection. ELISA or Rapid tests are recommended as the first-line HIV test for antenatal screening. Rapid HIV tests use rapid-test deliver results within 20 minutes of the sample being taken. It should however be always confirmed with the Western Blot Test.

Antenatal Care of Women who are HIV Positive

Management should be by a multidisciplinary team, including an HIV physician, obstetrician, specialist midwife, health advisor and paediatrician. HIV status of their partner should be assessed. Routine antenatal care including ultrasonography as per recommendations and screening for structural and chromosomal abnormalities should be carried out.

Vaccination

Hepatitis B and pneumococcal vaccination is recommended for all individuals who are HIV positive and can be safely administered in pregnancy. Influenza vaccination can also be safely administered in pregnancy and the decision to immunise depends on the time of year.

Once a pregnant woman with HIV is identified, ART should be started based on the CD4 cell count and WHO clinical staging. ***Assessment of the CD4 cell count is currently the cornerstone of determining ART eligibility.*** In settings where CD4 cell counts are not available, evaluation of the WHO clinical stage alone can be used to determine ART eligibility.

Clinical Staging of Disease :

Clinical stage 1

- Asymptomatic
- Persistent generalized lymphadenopathy

Clinical stage 2

- Moderate and unexplained weight loss (<10% of presumed or measured body weight)
- Recurrent respiratory tract infections(such as sinusitis, bronchitis, otitis media, pharyngitis)
- Herpes zoster
- Recurrent oral ulcerations
- Papular pruritic eruptions
- Angular cheilitis
- Seborrhoeic dermatitis
- Onychomycosis (fungal nail infections)

Clinical stage 3

- Unexplained chronic diarrhoea form longer than one month
- Unexplained persistent fever (intermittent or constant for longer than one month)
- Severe weight loss (>10% of presumed or measured body weight)
- Oral candidiasis
- Oral hairy leukoplakia
- Pulmonary tuberculosis(TB) diagnosed in last two years
- Severe presumed bacterial infections (e.g. pneumonia, empyema, meningitis, bacteraemia, pyomyositis, bone or joint infection)
- Acute necrotizing ulcerative stomatitis, gingivitis or periodontitis
- Unexplained anaemia (< 80 g/l), and or neutropenia (<500/µl) and or thrombocytopenia (<50 000/ µl) for more than one month

Clinical stage 4

- HIV wasting syndrome
- Pneumocystis pneumonia
- Recurrent severe or radiological bacterial pneumonia
- Chronic herpes simplex infection (orolabial, genital or anorectal of more than one month's duration)
- Esophageal candidiasis
- Extrapulmonary tuberculosis
- Kaposi's sarcoma
- Central nervous system toxoplasmosis
- HIV encephalopathy

Investigations :

Before initiation of therapy

- CD$_4$ count

- Plasma HIV RNA (viral load)
- Complete blood count
- Liver and renal function tests
- Serology for Hepatitis A, B and C
- VDRL and Urinalysis
- Fasting Blood sugar and serum lipids

Based on clinical staging and CD4 count, decision regarding starting of treatment or anti-retroviral prophylaxis is taken.

The preferred first-line ART regimen in pregnancy comprises of:

- AZT is started from as early as 14 weeks of gestation.
- NVP/3TCis given at the start of labour.
- AZT + 3TC until 7 days after delivery
- If maternal AZT was given for more than 4 weeks antenatally, AZT alone may be given during labour and delivery.

EFV should not be started in the first trimester, and NVP should be used instead. EFV may be used in second and third trimesters.

Daily Nevirapine is given to the neonate from birth until one week after all exposure to breast milk has ended or for 4 to 6 weeks if breastfeeding ceases before 6 weeks.

The purpose of treatment in pregnancy is to prevent transmission to the child as well as treat the mother. The indications of starting the medication are same as that in non-pregnant adults.

However, if a woman who is already on treatment and conceives, needs a closer watch as well as a team approach in management as there is a need to balance the advantage of continuing the treatment for the mother's sake and the disadvantage of affecting the period of organogenesis in the developing foetus.

The treatment should be started in:

1. Stage 1 & 2. When CD4 counts <200.
2. Stage 3. When CD4 counts <350.
3. Stage 4 irrespective of CD4 counts.

Mode of Delivery :

A decision about mode of delivery should be made by 36 weeks of gestation.

Delivery by elective caesarean section at 38 weeks to prevent labour and/or ruptured membranes isrecommended for :

a. Women taking HAART who have plasma viral load >50 copies/ml.

b. Women taking ZDV monotherapy as an alternative to HAART

c. Women with HIV and hepatitis C virus coinfection.

d. Delivery by elective caesarean section for obstetric indications or maternal request should be delayed until 39+ weeks in women whose plasma viral load is <50 copies/ml, to reduce the risk of transient tachypnoea of the new born.

- A ***planned vaginal delivery*** can be offered to women taking HAART who have a plasma viral load of <50 copies/ml.

Precautions to be taken during delivery

Vaginal Delivery

- HAART should be prescribed and administered throughout labour.
- Minimise INTERNAL examinations
- Avoid undue prolongation of labour
- Avoid routine episiotomies
- Avoid methergin in women receiving protease inhibitor or Efavirenz.
- Cleansing with chlorhexidine if >4 hours of rupture of membranes.
- All blood and amniotic fluid should be wiped quickly from infant.
- The umbilical cord should be cut quickly under gauge cover.
- Invasive procedures such as fetal blood sampling and fetal scalp electrodes are contraindicated.
- If labour progress is normal, amniotomy should be avoided unless delivery is imminent.
- Amniotomy and possible use of oxytocin may be considered for augmentation of labour.
- If instrumental delivery is indicated, low-cavity forceps are preferable to ventouse.

Elective Caesarean Section :

- If intravenous ZDV is indicated, the infusion should be started 4 hours before beginning the caesarean section and should continue until the umbilical cord has been clamped.
- The surgical field should be kept as haemostatic as possible and care should be taken to avoid rupturing the membranes until the head is delivered through the surgical incision.

Postpartum management of women who are HIV positive

- Women should be given supportive advice about formula feeding.
- An immediate dose of oral cabergoline should be given to suppress lactation.
- Women taking HAART should have their medication prescribed and administered.
- Guidance about contraception should be given in the immediate postpartum period.
- MMR and varicella zoster immunisation may be indicated, according to the CD4 lymphocyte count.

Management of the Neonate

All neonates should be treated with anti-retroviral therapy within 4 hours of birth.

- Prophylaxis is recommended only for neonates at high risk of HIV infection.
- HIV DNA PCR (or HIV RNA testing) should be performed on day 1, 6 weeks and 12 weeks of age and on other occasions if additional risk (e.g. breast-feeding).
- If all these tests are negative and the baby is not being breastfed, the parents can be informed that the child is not HIV-infected.
- A confirmatory HIV antibody test is performed at 18 months of age.
- Infants >72 hours old, born to untreated HIV-positive mothers, should immediately be put on three drug therapy for 4 weeks.
- Zidovudinemonotherapy is recommended if maternal VL is >50 HIV RNA copies/mL at 36 weeks' gestation or thereafter before delivery.
- Three-drug infant therapy is recommended for all circumstances other than above where maternal VL at 36 weeks' gestation/delivery is not >50 HIV RNA copies/mL.

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Screening for Fetal Infection in Antenatal Care

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Viruses like cytomegalovirus (CMV), rubella, varicella-zoster, parvovirus B19 and parasites like Toxoplasma gondii can be transmitted from a pregnant woman to her fetus and can affect fetal development[1]. These Infections are more serious in pregnant than non-pregnant women because of the potential for vertical transmission to the fetus or infant.

Various factors determine the likelihood of fetal infection and the risk to the fetus: the duration of gestation, recurrence, the immunologic status of the mother. Clinically specific symptoms are not diagnostic but increase the likelihood of fetal involvement in the presence of a documented recent maternal infection. Pre-pregnancy or routine antenatal screening for presence of, or susceptibility to, some of these infections and appropriate management can prevent adverse fetal or prenatal outcome.[1]

Diagnostic tests need to be carried out following maternal exposure to an infectious pathogen, finding sonographic markers of fetal infection during a routine ultrasound scan or, more rarely, symptomatic maternal infection. Evidence of fetal infection relies on the identification of the organism or detection of its antigens in fetal compartments (amniotic fluid, fetal blood) or the detection of organism specific immunoglobulin (Ig)M antibodies in the maternal blood. Knowledge of the specific diagnostic methods available is crucial for accurate diagnosis, counseling and treatment. In cases of suspected fetal infection, clinicians need to be familiar with the risk and spectrum of associated fetal damage, the benefits and limitations of prenatal diagnosis and the effectiveness of potential treatment in order to determine an appropriate management plan. Care in such cases is optimally provided by a multidisciplinary team involving obstetricians, neonatologists and fetal medicine specialists.

Congenital CMV infection

Congenital CMV infection is one of the most common congenital infections, with a reported incidence of 1-2%[2]. It is one of the leading causes of childhood deafness and mental retardation. Primary infection is usually asymptomatic or a mild illness characterized by fever, lethargy and malaise. Some patients have mononucleosis like syndrome with cervical lymphadenopathy, pneumonia and hepatitis.

Congenital CMV is mainly related to primary maternal infection, where the risk of vertical transmission is 40% in the first and second trimesters; fetal damage occurs in about 25% of these cases. Transmission occurs in about 80% of cases in the third trimester but it is usually asymptomatic after 27 weeks of gestation[3]. In recurrent infection (reactivation of an existing infection or reinfection with a different strain), the transmission rate is in the region of 1–2.2%.

Sequelae of fetal infection

Neonatal congenital CMV results in ocular defects (chorioretinitis, microphthalmos, cataracts and optic atrophy), sensorineural deafness, hepatosplenomegaly, jaundice, thrombocytopenic purpura, pneumonitis and fetal growth restriction. The risk of damage in fetuses infected as a result of primary maternal infection is about 25%.

Approximately 10% of infected fetuses are clinically symptomatic at birth and a further 10–15% of those asymptomatic at birth will develop some long-term sequelae, primarily sensorineural hearing loss[4,5].

Maternal diagnosis is traditionally based on serology testing for CMV-specific immunoglobulin M (IgM) and IgG. It is most helpful if paired samples are available, particularly if the woman's serostatus can be confirmed prior to conception or at the time of booking.

Diagnosis of fetal infection

Ultrasonographic findings are helpful but not diagnostic because CMV has features in common with other intrauterine infections and with other fetal disease. Moreover, these abnormalities are observed in less than 25% of infected fetus. The most frequently reported sonographic findings are IUGR, cerebral ventriculomegaly, ascites, intracranial calcifications, oligohydroamnios, microcephaly, hyperechoic bowel etc. If primary infection or reactivation of maternal CMV is confirmed, prenatal diagnosis can be offered to determine the risk of fetal infection. Fetal diagnosis is based on the detection of CMV in amniotic fluid, usually by PCR. Amniocentesis should be delayed for a minimum of 6-7 weeks after maternal seropositivity is confirmed to allow accumulation of CMV to detectable levels in amniotic fluid. Since fetal diuresis is not established until approximately 18–20 weeks of gestation, results can be negative from amniocentesis[6].

Human parvovirus B19

Human parvovirus B19 has a predilection for rapidly dividing cells, mainly the erythroid cell precursors, thereby interrupting red cell production. Adult infections are frequently subclinical but may present as erythema infectiosum (fifth disease), which consists of transient fever, malaise and arthralgia. In contrast, congenital parvovirus B19 infection can cause profound fetal haemolytic anemia, leading to cardiac failure, hydrops and intrauterine death[7,8].

Approximately 60% of adults have serological evidence of prior infection with B16 and the presence of human parvovirus IgG appears to confer lasting immunity. The primary infection rate in pregnant women, as measured by the frequency of seroconversion, is about 1.1% per year. Transplacental transmission occurs in 15% of cases before 15 weeks of gestation and 25% between 15–20 weeks: this rises to 70% towards term[7,8].

Testing for parvovirus B19 during pregnancy is most commonly the result of a history of recent maternal exposure or the finding of fetal hydrops during sonographic examination. The incubation period is 5–7 days following exposure and women are infectious for 3–10 days post-exposure or until the rash appears. Symptoms peak around day 9 and the rash may appear up to 18 days after exposure[9].

Sequelae of fetal infection

Fetal infections results in miscarriage, anemia, nonimmune hydrops and intrauterine death. There is a 9% excess fetal loss rate before 20 weeks of gestation. The risk of hydrops is low (3%) but it has a fatality rate of 50%. It usually occurs about 5 weeks after maternal infection and spontaneous resolution may occur 1–7 weeks after diagnosis. The risk of intrauterine death in parvovirus B19 IgM-positive mothers is 10% and most deaths occur 4–6 weeks following the onset of maternal symptoms but they can occur up to 3 months later.[8]

Maternal infection is diagnosed mainly by serological means, but detection of the parvovirus genome by PCR may be helpful in some cases. Once again, it is useful if paired samples are available from prior to and after the infection.

Fetal infection can be diagnosed by detection of human parvovirus B19 IgM or viral DNA as described above, using amniotic fluid or fetal blood. In the absence of signs of fetal anemia, however, the value of testing is of uncertain clinical importance.

Once maternal infection has been confirmed, monitoring of the fetus using serial ultrasound examinations should be undertaken. These should start 4 weeks after the onset of illness or date of seroconversion and then be done at 1- to 2-weekly intervals for up to 12 weeks. The aim of monitoring is

to identify signs of potential fetal anaemia, which include ascites and hydrops. Recently, measurement of fetal middle cerebral artery peak systolic velocity (MCA-PSV) was shown to be useful in identifying cases of moderate or severe anaemia.[10,11]

Toxoplasmosis

Toxoplasma gondii is a parasitic infection that can be acquired by ingestion of toxoplasma tissue cysts in undercooked meat or from infectious oocysts which are excreted by cats or which are present in contaminated soil/water[12]. The prevalence of toxoplasma antibodies in women of childbearing age varies with country of residence and age of group studied but ranges from 10–96%. Primary infection is often asymptomatic (60–70%) but some women suffer malaise, fever or lymphadenopathy.

Fetal transmission risk increases with gestational age at seroconversion (from 1% before 4 weeks, between 4–15% at 13 weeks, to 60% at 36 weeks). Conversely, the risk of congenital abnormality is inversely related to the gestation at maternal infection, such that the severity is greatest when infection occurs during the first trimester. Thus, the combined risk of having an affected fetus, given proven maternal primary infection, is highest in the middle of pregnancy, at 13–28 weeks[13,14].

Sequelae of congenital infection

Toxoplasmosis mainly affects the central nervous system and eyes and can cause microcephaly, ventriculomegaly, hydrocephalus and chorioretinitis. The child may experience the following: learning difficulty; convulsions and spasticity; and chorioretinitis and blindness. Any organ can be affected, however, and other consequences of congenital toxoplasmosis include hepatosplenomegaly, anaemia, rash, pneumonitis and jaundice[13].

Diagnosis of maternal infection

The approach is mainly serological and based on testing for toxoplasma-specific IgG and IgM. Again, analysis of paired samples from before and after infection is very useful. A combination of tests will help determine the timing of infection; the interpretation of these should be made in conjunction with an accurate record of maternal history.

Diagnosis of fetal infection

Fetal diagnosis is based on the detection of toxoplasma gondii DNA in amniotic fluid. Amniocentesis should be considered from 16 weeks of gestation, as a positive result would lead to treatment with spiramycin regimen. It must, however, be appreciated that, since fetal diuresis is not fully established until 18–20 weeks of gestation and accumulation of toxoplasma to detectable levels may not occur for up to 6 weeks after maternal seroconversion, a negative result prior to this may necessitate a repeat procedure. Cordocentesis to detect fetal immunoglobulin M (IgM) has been used but has significantly lower sensitivity for the detection of fetal infection.[14,15]

Toxoplasma IgM usually appears within 2 weeks of exposure and it can persist for up to 18 months but the length of time that IgM is detectable varies between individuals and with the assay used. IgM measured using EIA can be detectable for 3–6 months; when measured using ISAGA it is detectable for 12–15 months. The false positive rate is approximately 2% and, therefore, positive tests on a sample should be repeated. Toxoplasma IgG usually appears approximately 2 weeks after exposure and is lifelong. Measurement of IgG reactivity on sequential samples may be informative. Toxoplasma IgG avidity of 30% indicates infection within the preceding 3 months, whilst 40% indicates infection 6 months previously[15].

Since the negative predictive value of PCR is not 100%, monthly ultrasound follow-up should be initiated even in cases of negative amniocentesis. In cases where the amniotic fluid is positive for toxoplasma DNA, transmission to the fetus is assumed. The risk of an affected fetus should be assessed in conjunction with timing of maternal infection, although it should be seen as an evolving risk that can only be influenced by spiramycin administration. Ultrasound features described include

ventriculomegaly, hydrocephalus, microcephaly, intracerebral calcification, cataract formation and ascites.

Rubella

The rubella virus has become less of a problem since the introduction of routine vaccination. Infection in pregnancy is rare but the proportion of women of childbearing age thought to be susceptible to the rubella virus is in the region of 1–2%. The incubation period is 14–21 days and women are infectious from 7 days before until 7 days after the onset of the rash. Maternal rubella infection is generally asymptomatic or a mild illness of malaise, headache, coryza and lymphadenopathy, followed by a diffuse, fine maculopapular rash. In contrast, the effects on the fetus can be devastating if infected in the first trimester. Vertical transmission occurs during maternal viraemia; the risk of fetal infection is 90% before 12 weeks of gestation, about 55% at 12–16 weeks and it declines to 45% after 16 weeks. The risk of congenital defects in infected fetuses is 90% before 12 weeks, 20% between 12–16 weeks and, thereafter, deafness is a risk up to until 20 weeks. Reinfection can occur and is more likely after prolonged or intense exposure and with vaccine-induced, rather than natural, immunity. It is usually subclinical, however, and the risk to the fetus is thought to be 5%[16].

Sequelae of fetal infection

The congenital rubella syndrome involves a wide spectrum of clinical features. In order of decreasing frequency, manifestations include hearing loss, learning disability, cardiac malformations and ocular defects. Multiple defects and those affecting the central nervous system, eye and heart appear only to occur when transmission takes place before 16 weeks. Other consequences include fetal growth restriction, hepatosplenomegaly, jaundice, thrombocytopenic purpura, anaemia and rash. Many infants with the congenital rubella syndrome experience late manifestations, including endocrinopathies, late onset deafness, ocular defects and neuro-developmental problems[16].

Diagnosis of maternal infection

Diagnosis is serological but accurate interpretation of results is crucially dependent on appropriate diagnosis of maternal infection and appropriate timing of testing in relation to the onset of the rash.

Diagnosis of fetal infection

The need for prenatal diagnosis will be determined by the gestation at which the infection is likely to have occurred. Commonly used serological tests for rubella IgM EIA . Different assays have different sensitivities for detecting IgM and, therefore, the test must be repeated if negative and taken within 7 days of appearance of the rash. There is a false positive rate associated with IgM assays and the predictive value of a positive test has declined as a result of the low prevalence of the disease. The diagnosis of acute rubella infection from rubella-specific IgM must be made with caution and with reference to history of rash, exposure, history of vaccination and previous rubella testing[17].

Rubella IgG EIA

Women are screened for the presence of rubella IgG antibodies at the beginning of pregnancy. Those with a level 10 iu/ml are considered susceptible to rubella infection. IgG is usually present 1 week after the onset of rash but may be detected earlier using different assays.

Rubella IgG avidity

This may help distinguish between recent and distant infection. High avidity indicates an infection 6 months ago, whereas low avidity antibodies are found in recent infections up to 3 months previously. Infection and severe malformation occur in the first 12 weeks, it would be reasonable to consider termination of pregnancy. After 16 weeks of gestation, the risks to the fetus are minimal. Prenatal diagnosis is probably best reserved for infections occurring between 12–16 weeks, when there is a 55% risk of transmission and a 20% risk of congenital rubella syndrome.[17]

There is no standard test for prenatal diagnosis of rubella infection but most commonly reverse transcriptase PCR (RT-PCR) is used for the detection

of viral nucleic acid in amniotic fluid. Fetal blood can also be tested rubella-specific IgM. Sensitivity improves where testing was delayed for more than 6 weeks after maternal infection. For these reasons, a negative result may warrant further amniocentesis or fetal blood sampling at a later gestation. The fetus should also be monitored with serial monthly ultrasound scans.

Varicella

Primary infection is common in pregnancy and is estimated to occur in 3 per 1000 pregnancies.[18]

Primary infection is characterised by fever, malaise and a distinctive pruritic maculopapular rash that becomes vesicular and then crusts before it heals over. The incubation period is 10–21 days and patients are infectious from 48 hours prior to the onset of the rash until the vesicles crust over. In a prospective study 46 of 1373 women who had primary varicella during the first 36 weeks of pregnancy, the risk of fetal varicella syndrome was 0.4% prior to 13 weeks of gestation and 2% between 13–20 weeks. Whilst there does not appear to be any risk to the fetus when maternal infection occurs between 20–36 weeks of gestation, in utero infection may present as shingles in the first few years of life. After 36 weeks, or when delivery occurs within 4 weeks of maternal infection, up to 50% of babies are infected and about a quarter of neonates develop clinical varicella.[19]

Sequelae of fetal infection

Fetal varicella syndrome is characterized by limb defects, dermatomal skin scarring and damage to the eyes and central nervous system. The most common symptoms are skin lesions (scars and skin loss) in 76%, ,neurological defects (cortical atrophy, spinal cord atrophy, limb paresis, seizures, microcephaly, Horner syndrome, encephalitis and dysphagia) in 60%, eye diseases (microphthalmia, chorioretinitis, cataracts and optic atrophy) in 51% and limb hypoplasia in 49%. Other abnormalities include fetal growth restriction, muscle hypoplasia, gastrointestinal and genitourinary defects, developmental delay and, more rarely, cardiac defects.

Conclusion

The approach to the prenatal diagnosis of congenital infection varies according to the gestational age and the likely infectious agent. An essential common step is to confirm maternal infection, most frequently serologically, by testing for pathogen-specific IgG and IgM. The interpretation of results can be difficult, particularly in the absence of a pre pregnancy sample, such that seroconversion from IgG negative to IgG positive cannot be demonstrated. The risk of transmission to the fetus and the chance of fetal damage relate specifically to the pathogen and gestation at infection. Amniocentesis to test for the presence of DNA by PCR is the mainstay of diagnosis of fetal infection in most cases but the timing of the test in relation to the likely point at which transmission occurred is crucial. Furthermore, the detection of virus alone is not synonymous with fetal damage and a negative result does not completely exclude the possibility of fetal infection. Ultrasound surveillance is the primary tool for determining the degree of damage but it, too, has limitations in accurately predicting the outcome for the baby. There are few therapeutic options for the infected fetus and these are currently limited to intrauterine blood transfusion in cases of anemia due to parvovirus infection and maternal antibiotics.

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Everyone loves to talk to someone

who truly listens to what they are saying.

Viral Infections during Pregnancy

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Rubella or German measles in pregnancy

Rubella is caused by a fragile, single stranded RNA virus, spread via respiratory droplets or in utero transmission. The incubation period is 2 to 3 weeks. Malaise, fever, conjunctivitis, lymphadenopathy (postauricular and suboccipital) with a pink macular rash starting on the forehead and spreading over the trunk and limbs. Rarely secondary bacterial pneumonia, arthralgia, encephalitis and thrombocytopenia may occur.

Diagnosis is clinical and serological testing for rubella IgG and IgM is easily available. Confirmation by viral culture of urine, nasopharynx and cerebrospinal fluid is rarely necessary. Rubella specific IgG indicates previous infection or immunisation and IgM indicates active disease and high risk of fetal infection.

During pregnancy, rubella infection does not confer increased risk to the mother, but severe teratogenic effects on the fetus are well known. The vaccine is live attenuated and contraindicated during pregnancy. Therefore testing for rubella is mandatory during preconception and vaccine should be offered to the non immune woman. Pregnancy should be avoided for one month after the vaccine. Ideally, routine booking tests in pregnancy should include serological testing for presence of rubella antibodies. Non immune women should be warned against contact with affected people. Immunization in infancy at 15 months (MMR) will bring down the incidence in community.

The fetal infection induces severe anomalies and permanent disability. The earlier the gestational age of exposure, the greater the fetal morbidity of 80% in first trimester 1 and 25% in second trimester. The congenital defect of 'Congenital rubella syndrome' is a spectrum of cataract, retinopathy, microphthalmia, glaucoma, patent ductus arteriosus, pulmonary valve lesions and sensorineural deafness. Apart from this, there is emerging evidence in favour of higher risk of schizophrenia in adulthood due to adverse effect of prenatal infection on critical brain development.

When a pregnant woman presents with non-vesicular rash compatible with a viral infection, irrespective of previous history of infection or vaccination, she should be tested for rubella and parvovirus infection. Postpartum vaccination should be considered in non immune women especially who are desirous of future pregnancies. If infection is confirmed in the first trimester3, termination of pregnancy should be offered. Later in pregnancy, evidence for fetal infection should be sought. Fetal blood sampling for rubella specific IgM, and rubella specific RNA identified using reverse transcriptase – poltmerase chain reaction. (RT-PCR). There is no prenatal treatment once the fetus is affected.

Parvovirus Infection in pregnancy (Erythema infectiosum or Fifth's disease)

The human parvovirus B19 is a single stranded DNA virus. In non-immune pregnant women the disease is often asymptomatic, or a mild widespread rash, with minimal affects on the fetus. In women with pre-existing illness, however, the virus attacks the haemopoetic system, for eg. immunocompromised women may have chronic bone marrow failure, and those with sickle cell anemia can have aplastic crisis. Spontaneous

miscarriage and intrauterine fetal demise have been associatedin less than 5% of all infected women. The infection is not teratogenic, but can cause transient severe pancytopenia/anemia in the fetus resulting in hydrops or cardiac dysfunction from acute myocarditis.

Management : All pregnant women presenting with febrile illness and a non vesicular rash should be tested for rubella and parvovirus B19 infection. Women who test positive should be ideally promptly referred to a fetal medicine unit. The mother during illness requires only non specific supportive therapy of hydration, hygiene and rest. Additional prenatal visits, blood tests, and ultrasound to pick up fetal anemia and growth restriction are needed. The anemic hydropic fetus may be salvaged by aggressive in utero transfusions of red cells which will effectively prevent hydrops[2]. Infantile red cell aplasia has been reported following in utero transfusions and hence these babies need follow up.

Chickenpox (Varicella) in pregnancy

Varicella Zoster Virus (Chicken pox virus) is a DNA virus of the herpes family that is highly contagious and transmitted by respiratory droplets and by direct personal contact with vesicle fluid or indirectly via fomites.[1] Varicella, the primary infection with herpes varicella zoster virus (VZV), in pregnancy may cause maternal mortality or serious morbidity. It may also cause fetal varicella syndrome (FVS), or varicella infection of the newborn, it is characterised by fever, malaise and a pruritic rash that develops into crops of maculopapules which become vesicular and crust over before healing. The incubation period is 1–3weeks and the disease is infectious 48 hours before the rash appears and continues to be infectious until the vesicles crust over.Following the primary infection, the virus remains dormant in sensory nerve root ganglia but canbe reactivated to cause a vesicular erythematous skin rash in a dermatomal distribution known as herpes zoster (HZ), or shingles. Though the risk of acquiring infection from an individual with herpes zoster in non-exposed sites is less, however, exposed zoster should be considered to be infectious.[2]

Varicella prevention :

Preconception advice

In a woman seeking preconceptual advice,the varicella immune status can be determined by obtaining a past history of chickenpox and by checking the serum for varicella antibodies in those who have no history of previous infection If a woman of reproductive age is vaccinated, she should be advised to avoid pregnancy for 3 months and to avoid contact with other susceptible pregnant women should a post-vaccination rash occur.

During pregnancy : A previous history of chickenpox infection is 97–99% predictive of the presence of serum varicellaantibodies.[3] Therefore, In the pregnant woman at her initial antenatal visit, a history of previous chickenpox/shingles should be taken and restrict advice to women who have no history of previous infection. Such women must be advised to avoid contact with chickenpox and shingles during pregnancy and to immediately inform healthcare workers of a potential exposure and of course undergo postpartum vaccination. Routine serum testing for VZV IgG in these Women and postpartum vaccinationof those who are seronegativewas found to be cost effective in some situations,[4] If a pregnant woman gives a history of contact with chickenpox or shingles, history must be carefully verified the type of VZV infection, the timing of the exposure and the closeness and duration of contact.It would be ideal to subject the woman to a blood test for confirmation of VZV immunity. If the pregnant woman is not immune to VZV and she has had a significant exposure, she should be given VZIG as soon as possible. VZIG is effective when given up to 10 days after contact. Irrespective of whether VZIG is given, the pregnant woman should be managed as potentially infectious for 3 to 4 weeks.

Obstetric management : Timing and mode of delivery must be individualised. Delivery during the viraemic period is hazardous. The maternal risks are bleeding, thrombocytopenia, disseminated intravascular coagulopathy and hepatitis. There is a high risk ofvaricella infection of the newborn with

significant morbidity and mortality.[5,6] Supportive treatment and intravenous aciclovir is therefore desirable, allowing resolution of the rash, immunerecovery and transfer of protective antibodies from the mother to the fetus. Whenever caesarean section is called for due to obstetric emergencies epidural anaesthesia may be safest and a site free of cutaneous lesionsshould be chosen for needle placement.[7]

Precautions for healthcare worker: when women with varicella are admitted, the immune status of healthcare workers in maternity and neonatal units should be determined byhistory of past infection and by serological testing if the history is negative or equivocal.

Non-immune healthcare workers should be offered varicella vaccination and if they have had significant exposure to infection they should be reallocated to minimise patient contact from 8–21 days.

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Life is not an emergency,

unless you make it so.

Accept compliments,

Give compliments.

VACCINATION DURING PREGNANCY

DR. HEMA J SHOBHANE, Assistant Professor MLB Medical College Jhansi.

Indicated

- Purified tetanus toxoid 0.5ml in arm with interval of 1-2months.
- Hepatitis B *hepatitis B recombinant vaccine 1ml, im,at 0,1,6 months
- Hepatitis A*inactivated at 0, and 6-18 months.
- T dap between 27-36 weeks
- Rabies*pre- cell culture vaccine 1ml im at0,7,28 days. post exp -6 doses 0,3,7,14,28, and 90 days.
- Influenza (inactivated)*
- Small pox post exposure*
- Meningococcal*
- Polio*

Contraindicated

- Human Papilloma virus
- BCG
- Influenza (LAIV)
- MMR -avoid pregnancy for 28 days.
- varicella
- Zoster
- Japanese Ecephalitis
- Small Pox pre-exposure
- Anthrax - low risk of exposure

*Indicated only in high risk group

Infections in Pregnancy

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1. Laboratory indices of poor prognosis of malaria during pregnancy are all except
   a) Hemoglobin <7.1gm/dl
   b) Blood sugar <40mg/dl
   c) S. Creatinine > 3.0mg/dl
   d) PCV > 30%
2. Drug contra-indicated for managing malaria during pregnancy is
   a) Halofantrine
   b) Amodiaquine
   c) Quinine
   d) Proguanil
3. Intra-partum antibiotic prophylaxis for preventing Group B Streptococcus (GBS) neonatal infection is indicated in all of the following cases except:
   a) Intra-partum fever (temperature >100.4° F/ 38 °C)
   b) Delivery of twins
   c) Labour < 37weeks
   d) Amniotic membrane rupture >18hrs
4. Intra-uterine Parvovirus B 19 infection can cause all of the following except
   a) Fetal anemia
   b) Hydrops
   c) Fetal death
   d) Congenital anomalies
5. The following antiretroviral drug for managing HIV is teratogenic
   a) Nevirapine
   b) Zidovudine
   c) Efavirenz
   d) Ritonavir
6. "Rose spots" are small, pale red, blanching, slightly raised maculae appearing on chest and abdomen early in the onset of
   a) Tuberculosis
   b) Malaria
   c) Syphilis
   d) Typhoid
7. Antiviral medications useful for managing influenza during pregnancy are all except
   a) Acyclovir
   b) Oseltamivir
   c) Amantadine
   d) Zanamivir
8. Risk of complications like pneumonia following infection with H1N1 (swine flu) influenza virus in pregnant women is ..... times more than non-pregnant
   a) Two
   b) Four
   c) Six
   d) Ten
9. All of the following are live attenuated vaccines which are contra-indicated for administration during pregnancy except
   a) MMR vaccine
   b) Varicella vaccine
   c) Pneumococcal polysaccharide vaccine
   d) Small pox (vaccinia) vaccine
10. Sonographic findings of fetal ventricular dilatation, ascites, pleural/pericardial effusion, intracranial calcification, increased placental thickness, hepatomegaly & / or intra-hepatic calcifications can be seen in case of infection due to
    a) Toxoplasma gondii
    b) Herpes Simplex Virus (HSV)
    c) Syphilis
    d) Rubella
11. All of the following can be used for treating candidiasis during

QUIZ

pregnancy except

a) Nystatin
b) Clotrimazole
c) Fluconazole
d) Miconazole

12. Rubella is associated with ..... % risk of congenital malformations if acquired in the first trimester of pregnancy

a) 25
b) 40
c) 80
d) 100

13. ..... is approved for treatment of hepatitis B infection during pregnancy to achieve suppression of replication and achieve remission

a) Ganciclovir
b) Lamivudine
c) Acyclovir
d) Oseltamivir

14. Termination of pregnancy is advisable in none of the following first trimester viral infections during pregnancy except

a) Human parvovirus B19
b) Measles
c) Mumps
d) Rubella

15. While interpreting serological results of Toxoplasmosis the following combination indicates past infection and absence of current / recent infection

a) IgG negative / IgM negative
b) IgG negative / IgM positive
c) IgG positive / IgM negative
d) IgG positive / IgM positive

16. Vaginal delivery can be considered for an HIV positive woman on antiretroviral therapy when her HIV RNA viral load is 1000 copies/ ml. *True/ False*

17. Fetal varicella syndrome (FVS) only occurs with primary varicella infection during pregnancy & not with activation of pre-existing virus from its dormant state. *True/ False*

18. Asymptomatic bacteriuria during pregnancy should be treated because one fourth of these women can go on to develop acute pyelonephritis during pregnancy. *True/ False*

19. Concurrent administration of hepatitis B immunoglobulin (HBIG) and hepatitis B vaccine (HBV) does not diminish the immunologic response to vaccine. *True/ False*

20. Inadvertent exposure to chicken pox or rubella vaccine during pregnancy is an indication for termination of pregnancy. *True/ False*

References

1. High Risk Pregnancy Management Options. James DK et al, 4th edn, Saunders 2011
2. Protocols for High Risk Pregnancies. Queenan JT et al, 5th edn, Wiley-Blackwell, 2010
3. Medical disorders in pregnancy- an update. Konar H, Kushtagi P, 1st edn, Jaypee, 2006.

ANSWERS

1. d (PCV <20%)
2. a
3. b
4. d
5. c
6. d
7. a
8. c
9. Pneumococcal polysaccharide vaccine is not a live vaccine
10. a
11. c
12. c
13. b
14. d
15. c
16. False (vaginal delivery can be considered if viral load is <50 copies/ ml)
17. True
18. True
19. True
20. False

Free Rural Health Camps a Boon

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Serve the poor is the best worship of GOD.

- Swami Vivekananda.

Despite India's declining maternal mortality ratio, huge disparities present between different states and between districts in the same state. This disparity is due to differential levels of socioeconomic development. Due to this several initiatives, including a project to scrutinize why mothers die in remote rural areas, are undergoing to try to change the situations. New Delhi, Dec 11, 2012: survey data on maternal mortality ratio (MMR) is available from the report of Registrar General of India Sample Registration System (RGI-SRS) at three year intervals and is not provided every year. The latest available data on MMR is for the period 2007-09. During this period, this MMR of India was 212 per 100,000 live births. As per the same source, data for infant mortality rate (IMR) in India is available for the year 2009 was 50 and for 2010, it was 47. Most of these deaths could have been averted.

"The birth of a child is an important event in a family, but because families sometimes lack the necessary knowledge and awareness", says an official in the Ministry of Health and Family Welfare. The knowledge barrier is not the only concern, rugged terrain, unpaved roads, lack of transport at the critical hours, poor communication and poor health infrastructure are also some of the key barriers between pregnant women in remote village in India and good quality health care.

Free health checkup camps which are being organized in the rural areas are a boon for villagers as their financial condition doesn't allow them to avail good medical facility. Free health camps are conducted in the rural areas where people are neither able to afford medical treatment nor having any basic knowledge regarding health and hygiene. So, through these programs people are given various tips on health issues. Besides these, basic health problems and sickness are managed with free medicines. The rural health checkup camp program should be conducted in its targeted areas with the hired doctor from the government or private sectors. Infect, these programs have been great benefits to many such people who couldn't reach to the nearest local hospitals.

FOGSI has done a lot in order to help the needy beneficiaries in conducting such activities. In many places Mother and Child Care; AIDS/HIV awareness program are conducted continuously

Free Rural Health Checkup Camps and Benefits

Education and Awareness Programs;

The main problem was lack of awareness of dangers signs among rural families and lack of vehicle to take them to the health centers in time. Danger Sign (which can lead to a maternal death) are ignored because many villagers do not recognize them as such. Anemia is widespread, but there is little awareness about the clinical signs of it, its significance and way to tackle it. A team of senior consultants are from the FOGSI, IMA and other medical association with local doctors, bringing specialist medical opinion to the patients. This is beneficial for patients who cannot afford to travel long distance or

require immediate medical attention. In this manner a large number of people in rural areas suffering from serious illnesses have been treated and have received medical attention from the best of tertiary hospital doctors.

Various health programs for villagers providing basic education on health and hygiene are organized frequently. The programs focus on knowledge sharing about prevention and control, risk factors associated with disease and education for a healthy lifestyles and dietary habits. The program aim sat reducing target disease patterns in the areas.

Diagnostic aid by rural health camps;

During these health checkup camps the basic investigative facilities like BP monitoring, Hb estimation, blood sugar investigations, screening of cervical and breast cancer have been provided to update the patients about her health status.

Free medicine distribution;

Rural health camps help in distribution of tablets of iron, calcium. Antibiotic and antifungal drugs are given for vaginal discharge and PID. Distribution of tablets of albebdazole against worm infestation. Distribution of OC Pills, and condoms for family planning, free of cost is a great help for poor village people.

Comprehensive health services

Free rural health checkup camps provide curative, preventive, promotive and referral, to a large number of people in selected intervention areas.

Rural Health Checkup Camps and its Limitation

The regular continuous health checkup camps in a particular area are more beneficial in comparison to occasional camps in that particular area.

It is very vital that the general population is educated about health and related issues. This helps in ensuring a healthier tomorrow when one can take preventive steps and thereby reduce risk of ill health. Many health education programs are running well and these programs are customized so that they can be well understood by the local people and are also explained in the local language.

About half of total maternal deaths occur because of hemorrhage and sepsis. A large number of deaths are preventable through safe deliveries and adequate maternal health care by awareness and education regarding dangers sign. More than half of all married women are anemic and one third of them are malnourished and the gap can be filled by distribution of iron to all and awareness for prevention of anemia.

Key Message

Even after decades of freedom, India is struggling to provide basic health services to its people. Free rural health camps are get to reach out to pregnant women in underserved areas, ensuring that they receive the three essential antenatal checkups and distribution of iron tablets with immunization against tetanus and sensitizing them about the importance of institutional deliveries.

Education to people regarding the inappropriate practices such as delayed initiation of breast feeding, delayed clothing, and early bathing, not seeking care when newborn is sick and applying harmful materials on cord stump increase the risk of newborn deaths.

Thus "free health checkup camps are being organized in the rural areas are a boon for villagers as their financial condition does not allow them to avail good medical facility and by giving awareness and education traditional practices can be quit from community.

SAFE MOTHERHOOD DAY CELEBRATION - 11th APRIL

Safe Motherhood Day celebration at Duffrin Hospital Gorakhpur, Public & Health care giver meet

Safe Mother Hood Day Public awareness program in outdoor of Queen Mary Medical College Lucknow

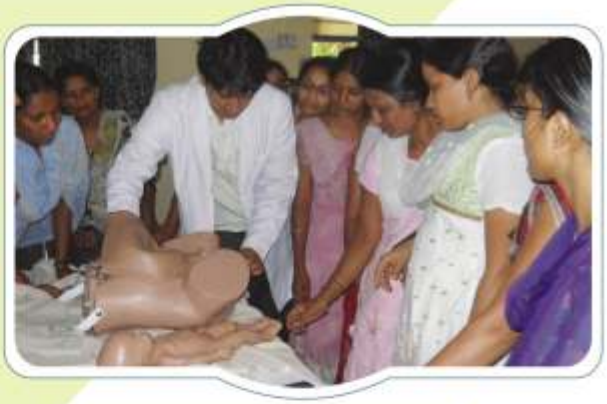
Press Conference & Inauguration of Safe Motherhood Day at YWCA, Thodupuzha

Rural Health Awareness Program and Health Camp at Jhansi

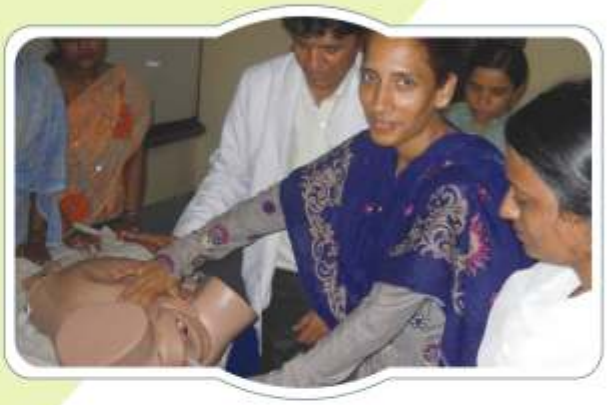
Series of rural camps in villages of Patna

In Bundelkhand region continued health program in remote villages by Dr. Hema Shobhane & Jhansi Obs & Gynaec Society

Rural Health Check-up Camp by Dr. Ranjana Khanna and Allahabad Obs & Gyn. Society



Dr. Rama Raju
and
his team members
conducting
training program
for
nurses in
obstetric care



Merrut series of
village health
check up camps
organized by
Dr. Bharti Maheshwari
&
team

Dr. Gracy Thomas
and
his team members
conducted Adolescent
Health Education
at Mulavukad PHC
and
Morning Star College,
Ankamaly

Notes

Forthcoming issue ...

Dear Readers and FOGSIAN friends,

It is our pleasure to communicate that forthcoming issue of safe motherhood bulletin is on following topic -

Safe Obstetric Practice

We request your contribution in form of articles, atypical case situation and quiz.

Besides for column India Speaks and project please share your experiences and projects.

Please mail your societies activities in field of safe motherhood for publication. mailing address **dr_sadhanag@yahoo.com**

Hearty thanks

Dr. Sadhana Gupta

Chairperson Safe Motherhood Committee

FOGSI (2011-2013)

We thankfully acknowledge the contribution of

Sun Spectra Division

LUPIN Pharmaceuticals

Jagson Pal Pharmaceuticals

for their contribution in Safe Motherhood Bulletin.


Behold a Girl,
Begin a Tomorrow