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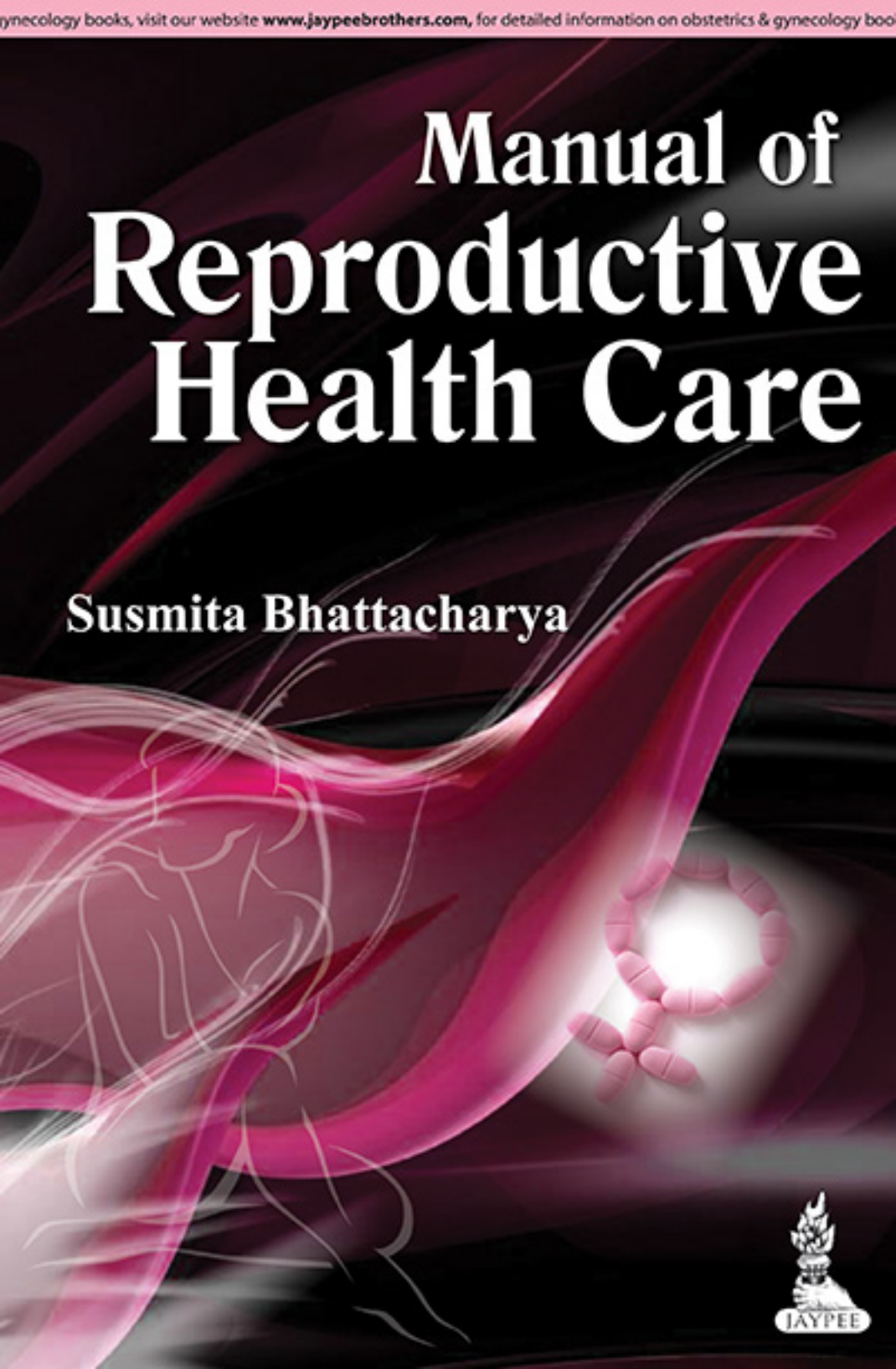
Manual of Reproductive Health Care

Susmita Bhattacharya



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Infections in Pregnancy

Infections during pregnancy are major contributor to pregnancy related complications. The infections in pregnancy can cause pregnancy wastage, abortions, anemia and malnutrition. Infections also lower immunity. Some of the infection may cross placental barrier and cause congenital malformations. Some of the viral infections may be transmitted to the newborn baby during parturition. There are large number of infections which may adversely affect health of pregnant women. Infections during pregnancy may cause infections in fetus which may persist for months after birth. A few of them are discussed subsequently.

MALARIA IN PREGNANCY

Malaria is one of the major public health problems in India. Around 1.5 million laboratory-confirmed malaria cases of are annually reported. Around 50% of the reported cases are due to *Plasmodium falciparum.*

Epidemiological pattern of malaria is changing in India. Malaria incidence is increasing in many parts of the country. In many places where malaria had low endemicity are now facing problem of epidemics of malaria. Yet another disturbing fact is that of increasing proportion of cases resistant to chloroquine.

Epidemic malaria is associated with increased maternal deaths, abortions, premature labor, still births, intrauterine growth retardation and low birth weight. In areas of moderate or high transmission, adults usually have immunity to malaria. During pregnancy this immunity is altered.

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Malaria in pregnancy is associated with placental parasitization. However, pregnant woman may remain asymptomatic and may go unsuspected and undetected. The malaria in this undetected pregnant woman is a common cause of anemia and low birth weight. These complications are seen in primigravida.

The vivax malaria and falciparum malaria both cause adverse effects in pregnancy. Falciparum malaria causes more severe complications. An important feature is that peripheral blood smear is negative despite heavy placental infection.

Clinical Manifestations of Malaria in Pregnancy

Clinical manifestations and severity of the disease varies according to previous immunity to malaria. In areas with low transmission with little or no immunity pregnant women are more likely to suffer from severe disease. They may suffer from hyperpyrexia, hypoglycemia, severe hemolytic anemia, cerebral malaria and pulmonary edema (Table 4.1). In areas with moderate or high transmission because of pre-existing immunity pregnant women rarely suffer from severe disease. The main effects are anemia in mother and low birth weight in baby.

Table 4.1: Clinical features and consequences of malaria

Mother	*Fetus*
• High fever • Hypoglycemia • Anemia severe • Cerebral malaria • Pulmonary edema	• Abortion • Still birth • Prematurity • Low birth weight **New born** • Congenital malaria

(*Source:* Essential Malariology, David A Warrell, Herbert M Gilles [Eds]).

Besides above mentioned complications, other risks are increased susceptibility to pneumococcal infections, urinary tract infections, puerperal sepsis and postpartum hemorrhage.

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Management of Malaria

Malaria in pregnancy is often asymptomatic and peripheral blood smear is negative. This makes diagnosis difficult. However, febrile cases or pregnant women with severe anemia should be treated with antimalarial drug. In non-immune patients prompt treatment is necessary.

Chloroquine is extensively used in treatment of malaria in pregnancy. Chloroquine is well-tolerated and there is no evidence of adverse effects.

Treatment of Plasmodium vivax Cases

Chloroquine-600 mg base (4 tablets) on day one, followed by 600 mg of base on day two and 300 mg on day three or equivalent of 10 mg/kg of body weight on day one, 10 mg/kg body weight on day two and 5 mg/kg body weight on day three.

According to National Drug Policy on Malaria (2010) presumptive treatment with chloroquine is not recommended. All P. vivax cases should be given primaquine to prevent relapse. However, primaquine is contraindicated in pregnancy.

Treatment of uncomplicated P.falciparum malaria in pregnancy:

First trimester: Quinine salt 10 mg/kg three times daily for seven days. It is important to note that quinine may induce hypoglycemia. Pregnant woman should be instructed to take quinine after food, not on empty stomach.

Second trimester and third trimester: Artemisinin Based Combination Therapy (ACT)

Artesunate 4 mg/ kg body weight daily for three days

Plus

Sulfadoxine (25 mg/kg body weight): Pyrimethamine (1.25 mg/kg body weight) on first day.

Widespread resistance to chloroquine is reported in many parts of the world. In chloroquine resistant cases sulphadoxine/ sulphane and pyrimethamine can be used.

In acutely ill cases quinine should be used. Acutely ill patient of malaria should be given intravenous infusion of quinine.

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Experience with treatment with quinine shows that it does not precipitate labor or fetal distress. However, severe malaria increases risk of abortion and still-birth. Major side effect of treatment with quinine is hypoglycemia, hence it is essential to monitor blood glucose level and promptly treat hypoglycemia.

Chemoprophylaxis: In endemic areas chemoprophylaxis with chloroquine can be started as early as possible and should be continued till two weeks after delivery. It has shown beneficial effects by reducing anemia and low-birth weight. Malaria is a serious threat to health of pregnant mother and her newborn baby. It increases risk of maternal and perinatal mortality many folds.

Prevention of malaria through effective malaria control program should receive priority. Community education to eliminate mosquito breeding places will have a long-term effect. All pregnant women should be advised to use insecticide treated mosquito nets and other personal protective measures to prevent mosquito bites.

HIV INFECTION IN PREGNANCY

Acquired immunodeficiency syndrome (AIDS) has become a pandemic. In India, the prevalence of HIV infection varies in different states. In high prevalence states more than one percent of pregnant women are HIV positive.

HIV can be is transmitted by:

- Unprotected sex with HIV positive person
- HIV infected blood transfusion
- Through infected needles
- From an infected mother to her child, during pregnancy, labor, delivery and postpartum through breast milk.

The risk of transmission from mother to baby varies from 10 to 33%. The transmission of HIV from mother to child is affected by some factors. They are viral load, viral genotype and phenotype, resistance of virus, maternal immunological factors, and nutritional status of mother. During delivery prolonged

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rupture of membrane, type of delivery, hemorrhage, and invasive procedures increase the chance of viral transmission.

Pregnancy does not alter the course of HIV infection. HIV has been detected in the cervical discharge of pregnant women. Early spontaneous abortions are also reported in HIV positive pregnant women. Higher incidence of pneumonia, tuberculosis and sexually transmitted infections are reported in HIV positive pregnant women.

Diagnosis of HIV infection is done by serological tests. Most commonly used test used for diagnosis is ELISA test.

Management of HIV Infection in Pregnant Women

Prenatal HIV screening is helpful in early diagnosis and treatment of HIV infection.

A pregnant woman who is detected as HIV positive in first trimester should be counseled and told about option of MTP. If she refuses and wishes to continue pregnancy she will need good antenatal, intrapartum and postnatal care. She will also need emotional support and counseling.

Following examinations will be required:

- Complete and thorough history, general and systemic examination.
- CD4 count
- Serological examination for hepatitis B infection.
- Renal function tests and liver function tests.
- Tests for detection of sexually transmitted diseases.

Pregnant women who are HIV negative but with history of contact with HIV positive partner should be counseled and given support.

Monitoring of weight and nutritional supplementation is necessary for them.

Antiretroviral Therapy

Antiretroviral therapy (ART) is recommended to a HIV-infected pregnant women. The principle is that benefit of ART should not

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be withheld from a pregnant woman, unless the risk of adverse effects on mother, fetus or infant outweighs the expected benefit to the mother. It may so happen that the pregnant woman does not need ART for her own disease; however, antiretroviral drugs are recommended for reduction of risk of transmission of HIV from mother to child.

Antiretroviral Drugs in Non-pregnant Women

While treating HIV positive women in reproductive age group; it is to be kept in mind that she may become pregnant while receiving ART. There is possibility that drugs may be received in early pregnancy before diagnosis of pregnancy. Efavirenz (EFZ) may cause severe birth defects and should be avoided in women who desire to become pregnant. It is necessary to counsel HIV positive women receiving ART about contraception to avoid unintended pregnancy.

Antiretroviral Drugs in Pregnancy

Regimens given to pregnant women should include drugs that are effective in reducing mother-to-child transmission. Zidovudine (ZDC), Lamivudine (3TC), Stavudine(d4T), Didanosine (ddI) and Nevirapine (NVP) are drugs used in pregnancy.

Nelfinavir (NFV) followed by Saquinavir (SQV) is most commonly used protease inhibitors. Antiretroviral drugs should be continued during labor (As per National AIDS Control Organisation guidelines).

Adherence to therapy, some issues: Adherence to recommended treatment plan in HIV positive woman during pregnancy and postpartum period is a challenging task. Many of them may suffer from morning sickness and gastrointestinal upset; ART may increase the symptoms. It may be very distressing to pregnant woman and she may discontinue antiretroviral therapy.

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Non-adherence to treatment has following risks:

- Increase viral load.
- Progression of infection to AIDS.
- Increased morbidity and mortality.
- Increased cost of care.
- Development of drug resistance.

Hence pregnant mother should be counseled and provided support during pregnancy and postpartum period for adherence to treatment.

Management during labor: A pregnant mother who is HIV positive should deliver in hospital. There is risk of transmission to health care staff. Hence person conducting vaginal delivery must observe strict safety precautions. Universal safety precautions are sufficient to prevent transmission to health care staff and there is no need of isolation of positive mother.

Childbirth Strategy in HIV Positive Women

Cesarean delivery reduces the risk of transmission of HIV to newborn, which occurs as baby is exposed to infected blood during delivery. However, it requires trained manpower, infrastructure and facilities which remain a challenge in country like India.

Care of newborn: Antibodies are passively transferred from mother to infant and they persist beyond 15 months. Diagnosis of HIV in infant is possible after 18 months. Infants born to HIV positive mother should be followed by every three months to identify and treat any infection. Besides there is possibility of low birth weight, problems of breastfeeding, inadequate feeding, failure to thrive and infections.

Breastfeeding

According to current WHO/UNAIDS/UNICEF guidelines, women with HIV infection should be explained in detail about risks and benefits of breastfeeding. HIV virus is transmitted through breast milk. Hence mothers may be advised not to

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breastfeed her baby. However, risk of not breastfeeding may be much higher than exclusive breastfeeding. Risk of diarrhea, because of contamination from unclean water, unclean utensils or milk left out for too long is a serious threat. Mastitis and nipple fissure increase the risk that the baby will be infected.

Replacement feeding using animal milk or commercially available formula feeding is the option available to HIV positive mother.

Teaching mother about replacement feeding:

- Ask the mother what kind of milk she chose.
- After delivery, prepare the feed for her; teach her how to prepare feed for baby at home.
- Teach her to wash her hands with soap and water and wash the utensil and cup thoroughly with soap and water.
- Teach her how much milk baby will need for each feed and how many feeds should be given.
- Teach her how to feed by cup and spoon.
- Instruct her to finish the milk within one hour, if baby does not finish the milk by one hour give it to older child.
- Give her written instructions of safe preparation of replacement feeding.
- Explain her risks of replacement feeding (a) risk of diarrhea and (b) risk of growth failure if she gives dilute milk or too few feeds.
- Explain her when to seek care at health center.
- Advice her for regular follow-up for growth monitoring.

Many a time, replacement feeding may not be a practical option.

It may not be affordable in poor socioeconomic groups. There can be social problem associated with mother not breast-feeding her newborn baby. Many a time, HIV status of mother is not known to family members. If mother does not breastfeed her baby, family members and relatives ask for reasons. Fearing discrimination, mother may give mixed feeding, she breastfeeds in presence of others and gives formula feeds when alone. Mixed feeding is harmful; there is increased risk of transmission of virus and also the risk of gastrointestinal

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infections. In such situation exclusive breastfeeding for six months should be advised. If woman requires ART, it should be continued as per schedule. However, effectiveness of antiretroviral drugs in prevention of transmission through breast milk is unknown.

All immunizations should be given to the infant at right time.

Counseling of mothers: Counseling is available to pregnant women through integrated counseling and testing centers (ICTC). These facilities are available at select places under National AIDS control program.

A pregnant woman coming for voluntary testing is given pre-test counseling. She is counseled about need of testing, consequences of testing, confidentiality issues, and limitations of test.

Post-test counseling is given after the test, while handing over test results. If test results are negative she should be given information about mode of spread of HIV, consequences of HIV infection, and prevention of it. This opportunity should be used for educating them about safe sex practices.

Counseling of HIV positive pregnant women: This is very sensitive issue and should be offered by a trained counselor. They have special needs like confidentiality, psychological support, access to MTP and abortion care, special antenatal care, treatment facilities, etc.

Based on above mentioned needs of HIV positive pregnant woman, following actions are required:

- Removal of fear and anxiety, she should be given support for coping with emotional distress.
- The information about effect of HIV on pregnancy.
- Risk of transmission to fetus.
- Option of termination of pregnancy and available facilities for termination.
- Treatment available.
- Information about breastfeeding and risks associated with both breastfeeding and top feeding.
- Follow-up of mother and infant.

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There are issues related to disclosure of HIV status to husband. It is necessary to explain advantages and possible problems after disclosure of HIV status. HIV positive pregnant woman is likely to face discrimination, isolation, neglect, mental and physical harassment and desertion by family members. All these social issues should be dealt with sensitivity.

VIRAL INFECTIONS IN PREGNANCY

Pregnant women are susceptible to viral infections. Viral infections during pregnancy adversely affect the health of pregnant women. In some of the viral infections the pregnant women may be at higher risk of suffering from severe form of disease. In many of the viral infections of pregnant mothers fetus and neonate is also infected. It may infect the fetus in the following ways:

- Maternal infection crossing the placental barrier: The infections which cross the placenta and infect the fetus are: Rubella, cytomegalovirus, HIV, measles, mumps, coxsackie B, hepatitis B, herpes simplex and varicella zoster.
- Through birth passage from maternal blood at birth. Some of the viral infections transmitted in this way are: hepatitis B infection, herpes simplex, HIV, coxsackie B, cytomegalovirus, varicella zoster.

Rubella

Rubella, also known as German measles, is a viral infection. It is prevalent all over the world. In vast majority, it is a mild disease which goes unnoticed. About 95% children in India acquire immunity by15 years of age, through subclinical infection.

Rubella infection in mother during pregnancy seriously affects the fetus. Rubella in pregnant woman is asymptomatic or mild in about half or even two-thirds of the cases. Rubella infection can occur only when pregnant woman does not have protective level of antibodies against it.

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Fetus is at risk of infection during maternal viremia. If infection is acquired in first trimester, spontaneous abortion or still-birth can occur. If the fetus survives, about 80% may get congenital anomaly. Risk is highest if infection is acquired during first eight weeks of pregnancy, which is the critical phase of organogenesis.

Persistent and generalized infection occurs when it is acquired in first trimester. If rubella occurs in between 13 to 16 weeks, congenital anomalies are less common and less severe. After 16 weeks, congenital anomalies are very rare.

In rubella, congenital anomalies are of following types:

- *Transient anomalies:* Low birth weight, prematurity, hepatosplenomegaly, thrombocytopenic purpura.
- *Developmental anomalies:* Sensorineural deafness, mental retardation, insulin dependant diabetes mellitus.
- *Ocular anomalies:* Cataract, glaucoma, retinopathy.
- *Cardiac defects:* Myocarditis, ventricular septal defects, pulmonary stenosis.

Congenital Rubella Syndrome (CRS) refers to triad of congenital cataract, congenital heart disease and deafness. However, it is no longer accepted. Congenital rubella is recognized as serious disease which affects multiple organs. It also causes pregnancy wastage and low birth weight and prematurity.

Diagnosis

Clinical disease in pregnant woman is often atypical. Rash is also seen in Arthropod Borne (ARBO) viral diseases like dengue, and chikungunya.

Pregnant woman with history of exanthema or exposure to a known case of rubella should be tested for specific IgM antibodies. Hemagglutination inhibition test is the most specific test. A positive test suggests active infection. Rising rubella specific IgG titer on serial testing also suggests infection. However, these tests are costly and may not be available.

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Management of Rubella in Pregnant Women

Rubella is a mild disease. The treatment is symptomatic.

If the symptoms suggestive of rubella are reported in pregnant woman till 10 weeks of pregnancy, she should be tested for specific antibodies. If she tests positive MTP should be suggested. Since antibody testing facilities are not available at many places she should be advised MTP if she had history suggestive of rubella.

Prevention: Rubella is a preventable disease. The vaccine widely used for this purpose is MMR vaccine, which is combined Measles Mumps and Rubella vaccine. Most of the developed countries have Rubella immunization program.

In India, MMR vaccine is available and it is used for immunization of children. However, it is not included in national immunization program. Girls who did not receive MMR vaccine in childhood can be given rubella vaccine between 11 to 15 years. Non-immune women can be immunized with rubella vaccine before pregnancy.

Toxoplasmosis

Toxoplasmosis is a parasitic infection and is widely prevalent in India. It has significant consequences in fetus.

Agent of toxoplasmosis is a parasite *Toxoplasma gondii*. Cats are the primary hosts of this infection. Infective organisms are passed in feces of cats. Man is a secondary host of toxoplasmosis. Infection is mostly subclinical in adults. Incidence of toxoplasmosis in pregnant women is reported to be 1 to 10 per 1000 pregnancies. Transmission of infection is related to poor standard of sanitation, poor personal hygiene, presence of pets in house, and more common in poor socioeconomic class.

Maternal infection infects the placenta. It may infect fetus. However, risk of congenital infection is different at different periods of pregnancy. The risk of congenital infection is 5 to 10% in first half of pregnancy and 30 to 50% in latter half.

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Congenitally infected babies are asymptomatic at birth. When infection is acquired in fist half of pregnancy it is severe as it is the critical period of fetal life.

Consequences of Congenital Toxoplasmosis

Fetus: Spontaneous abortion, IUGR, prematurity, congenital hydrocephalus, microcephaly.

Neonatal: Infection in neonate, seizures, hypotonia, lymphadenopathy, hyperbilirubinemia.

Infancy and childhood: Unexplained fever, delayed mile stone, mild-to-moderate mental retardation.

Diagnosis: Detection of IgM specific antibodies indicates recent infection. IgM antibodies more than 1:160 indicates an active toxoplasmosis.

Treatment: Mother should be treated with spiramycin for three weeks. The course of spiramycin should be repeated after two weeks. This will reduce the risk of fetal infection.

Newborn baby is asymptomatic at birth. Antibiotic treatment in infected newborn may reduce the risk of complications in later period in infancy and childhood.

There is large number of infections which affect pregnant women. Many of them cause morbidity in mother and adversely affect fetal health. However, only a few of them are discussed in this chapter.

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Manual of
Reproductive Health Care

Salient Features

- A comprehensive approach to the issues related to reproductive health of women
- Focuses on the prevention of reproductive health problems with community health orientation
- Involves the nutrition in women in a practical way
- Discusses the issues of adolescent girls in detail
- Chapter on abortion care deals with various aspects in a sensitive way and chapter on policies and programs provides background information for efficient and effective delivery of reproductive health services.



Susmita Bhattacharya has done her MBBS and MD (Community Medicine) from Government Medical College, Nagpur, Maharashtra, India. Presently, she is working as Professor and Head, Department of Preventive and Social Medicine, Rajarshi Chhatrapati Shahu Maharaj Government Medical College, Kolhapur, Maharashtra, India. She has been teaching community medicine since past three decades. She has undertaken many projects related to reproductive health, maternal and child health, and nutrition. She has special interest in the field of maternal and child health, reproductive health and nutrition and gender issues.

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