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Haemophilus influenzae type B genital infection and septicemia in pregnant woman: a case report

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PEER REVIEW

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Comments

This case report of *H. influenzae* type B genital infection and septicaemia is good because such infections have been reported infrequently in literature and would serve to alert obstetricians and microbiologist that *H. influenzae* should be considered as a potential maternal, fetal, and neonatal pathogen. Details on Page 209

ABSTRACT

Haemophilus influenzae (*H. influenzae*) type B a non-motile, aerobic, gram negative cocobacillus is a commensal of upper respiratory tract. Genitourinary infection due to *H. influenzae* has been reported but bacteremia associated with such infection appears to be rare. We report a case of 19 years young primigravida with complaints of amenorrhea of 32 weeks and 5 days, pyrexia, abdominal pain and blood stained discharge per vaginum. *H. influenzae* type B was recovered from the genital tract as well as blood of the mother indicating maternal septicemia. Septicemia caused by *H. influenzae* type B in pregnant women following vaginal colonization and infection is rare. It has been reported in many parts of world over the years; to the best of our knowledge this is the first reported case from Nepal. *H. influenzae* should be considered as a potential maternal, fetal, and neonatal pathogen.

KEYWORDS

Haemophilus influenzae type B, Maternal genital infection, Septicemia

1. Introduction

Haemophilus influenzae (*H. influenzae*) type B is primarily a respiratory commensal with potential to be a pathogen for not only respiratory tract, but other sites as well. It is rarely isolated from the normal genitourinary tract[1]. It is not only a maternal genitourinary tract pathogen but also a potential pathogen to the neonates. Genitourinary infection due to *H. influenzae* has been reported but bacteremia associated with such infection appears to be rare[2]. This case is reported as the vaginal infection in a lady leading to septicemia and premature labour.

2. Case report

A 19 years young primigravida reported with complaints of amenorrhea of 32 weeks and 5 days, fever since 2 days, abdominal pain and blood stained discharge per vaginum since one day. She had no other illness in the past. She did not consume tobacco or alcohol. She had attended antenatal clinic irregularly, was vaccinated against tetanus and had taken iron and folate supplements. She had no history of blurring vision, pedal edema or loss of consciousness. On examination she was found to be averagely built and nourished. There was mild anemia but no lymphadenopathy

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or pedal edema. Her pulse was 100/min, regular, temperature 38.8 °C, and blood pressure 110/80 mmHg in supine position. Examination of respiratory, circulatory, gastrointestinal systems did not reveal any abnormality. Abdominal examination revealed uterus corresponding with period of gestation. There were no uterine contractions. Fetal parts were felt well, with fetus in cephalic position, head was not engaged. Fetal heart rate was 170/min, regular. Per speculum examination revealed blood stained discharge.

Ultrasound examination of abdomen revealed live single fetus, in cephalic position. Gestational age corresponded with 30 weeks and 3 days. Expected fetal weight was within normal limits [(1651±248) g]. Other fetal measurements were within normal limits. Fetal heart rate was 175/min. Amniotic index was 11.77. The placenta was found to be Grade II. No congenital abnormality was detected.

Hematological investigations of the patient showed hemoglobin level of 9.4 g/dL and leukocytosis $13.1 \times 10^9/L$ with 75% polymorphs. High vaginal swab, urine and blood specimen were collected for microbiological investigations. Screening for HIV, HBsAg, HCV, and VDRL were negative. The patient was suspected to have sepsis and after collecting suitable specimen, she was empirically treated with injection of ceftriaxone, injection of metronidazole for 2 d followed by cefixime tab and metronidazole tab for 6 d.

Grams stain of mother's high vaginal swab showed number of pus cells but no bacteria. *H. influenzae* type B was isolated on culture and confirmed by serotyping. The organism was sensitive to ciprofloxacin, ceftriaxone, ampicillin, chloramphenicol but resistant to cotrimaxazole and azithromycin. *H. influenzae* type B with same antibiogram was also isolated from blood culture of the mother on 5th day of incubation. No pathogens were isolated from urine and stool specimen of the mother.

A female baby weighing 1.5 kg was delivered by emergency lower segment caesarean section under spinal anesthesia. Apgar scores at 1 min and at 5 min were 9/10 and 10/10 respectively. Clinical examination of the baby did not reveal any congenital abnormality. During clinical follow up over 36 h the baby suckled well, passed stool and urine regularly, muscle tone was normal, cry was normal, pulse, respiratory rate and body temperature were within normal limits. There were no complaints about baby by the mother. The baby did not reveal any clinical signs of septicemia.

3. Discussion

H. influenzae type B, a non-motile, aerobic, Gram negative cocobacillus, is a commensal of upper respiratory tract. Usually pathogenic strains express type B capsular

polysaccharide, one of six antigenically distinct capsule (A–F) found on encapsulated strains. It is a secondary invader of respiratory tract in children[3]. It is also an important etiology of neonatal meningitis. Genital tract infection due to *H. influenzae* type B is not common. A survey of cervical or high vaginal swab cultures among normal and pregnant women yielded *H. influenzae* in less than 1%[1,4]. More recently, non typeable *H. influenzae*, particularly biotype IV, have been recognized as obstetric and gynecologic pathogens[5,6].

The puerperal sepsis caused by *H. influenzae* type B has been reported, though the incidence is low[7,8]. Evidence has demonstrated that the *H. influenzae* isolates that cause maternal infections are often the result of an ascending infection that possess a specific tropism for genital tract[9]. There are cases of neonatal bacteremia due to *H. influenzae* type B reported in association with maternal genitourinary tract infections[10,11]. Bacteremia during pregnancy was associated with a 10% fetal mortality[12]. Septicemia during pregnancy is a rare occurrence, but it is associated with an unexpectedly poor fetal outcome and a high mortality rate.

Perinatal infection due to *H. influenzae* type B is associated with severe morbidity and mortality. It is a rare intrauterine infection, but its importance and prevalence is perhaps increasing as reflected by the growing number of reported cases in the last 25 years. Two possible mechanisms of transmission of *H. influenzae* to fetus during pregnancy are hematogenous spread with subsequent infection of placenta or amniotic fluid, or an ascending infection from the cervix and vagina.

The source of *H. influenzae* type B infection of mother in this case was not well established and baby did not reveal any clinical signs of septicemia. *H. influenzae* was recovered from the genital tract as well as blood of the mother indicating maternal septicemia. Prospective studies of maternal vaginal flora using appropriate culture techniques could help to determine the prevalence, transmission, potential morbidity and treatment guidelines of *H. influenzae* in pregnant women.

This case report is to alert obstetricians and microbiologist that *H. influenzae* should be considered as a potential maternal, fetal, and neonatal pathogen. Since *H. influenzae* can cause significant morbidity and mortality, incorporating a screening protocol to detect colonization by potential pathogens like Group B streptococci, enterococci, haemophilus, and staphylococci may have beneficial effects. It will be helpful in reducing the maternal and neonatal morbidity and mortality.

Conflict of interest statement

We declare that we have no conflict of interest.

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The authors would like to acknowledge the patient who consented to publication and written informed consent was taken from the patient for publication of this case report.

Comments

Background

H. influenzae represents a significant cause of antepartum and post-partum sepsis, neonatal meningitis, fetal death in utero and premature rupture of membranes. *H. influenzae* serotype B being the most pathogenic for humans is responsible for respiratory infections, ocular infection, sepsis and meningitis. Genitourinary infection due to *H. influenzae* has been reported but bacteremia associated with such infection appears to be rare.

Research frontiers

Considering the fact that infections with *H. influenzae* type B causing genital infection leading to septicaemia are rare, it appears to be a case being reported for the first time from Nepal.

Related reports

Genital tract infection due to *H. influenzae* type B is not common. A survey of cervical or high vaginal swab cultures among normal and pregnant women yielded *H. influenzae* in less than 1% as reported by Laura *et al.* (2010) and Marti (2012). The puerperal sepsis caused by *H. influenzae* type B has been reported, though the incidence is low reported by Mhisti *et al.* (2006). Evidence has demonstrated that the *H. influenzae* isolates that cause maternal infections are often the result of an ascending infection that possess a specific tropism for genital tract as reported by Elizabeth *et al.* (2009).

Innovations & breakthroughs

Septicemia caused by *H. influenzae* type B in pregnant women following vaginal colonization and infection is rare. It appears to be a case being reported for the first time from Nepal.

Applications

This case report is to alert obstetricians and microbiologist that *H. influenzae* should be considered as a potential maternal, fetal, and neonatal pathogen. It should be a part of the screening protocol for potential pathogens. It will be helpful in reducing the maternal and neonatal morbidity and mortality.

Peer review

This case report of *H. influenzae* type B genital infection and septicaemia is good because such infections have been reported infrequently in literature and would serve to alert obstetricians and microbiologist that *H. influenzae* should be considered as a potential maternal, fetal, and neonatal pathogen.

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