

Pre-natal diagnosis of congenital syphilis; a case report

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Abstract

A sixteen-year-old unmarried primigravida was referred from General hospital Hambantota to Teaching hospital, Ragama for specialized management of foetal anaemia and ascites at 32 weeks of gestation. She was diagnosed as secondary syphilis with condylomata lata lesions and had a VDRL titre of R:16 and treated with one dose of intramuscular Benzathine penicillin two days prior to transfer. Ultrasound scan was suggestive of foetal hydrops. Foetal anaemia was suspected and intrauterine transfusion of packed red cells performed successfully. Foetal blood was drawn during the procedure for VDRL and haemoglobin for the diagnosis of congenital syphilis and anaemia respectively. Despite maternal antibiotic treatment and intrauterine management of foetal complications, intrauterine death occurred at 33 weeks of gestation.

Key words: Congenital syphilis, intrauterine diagnosis of congenital syphilis, intrauterine blood transfusion, secondary syphilis in pregnancy, screening for syphilis in pregnancy.

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Full article

Introduction

Syphilis is a sexually transmitted infection and remains a global problem with an estimated two million pregnant women getting infected each year. In Asia-Pacific region, approximately 69% of pregnant women with syphilis experience adverse pregnancy outcomes. Syphilis screening services for pregnant mothers have been offered since early 1950s in Sri Lanka (1).

Syphilis is caused by *Treponema pallidum* subspecies *pallidum* and acquired by sexual contact with the important exception of congenital syphilis, where the infant acquires the infection by transplacental transmission of *T. pallidum*. Transmission to sexual contacts requires exposure to moist mucosal or

cutaneous lesions of primary or secondary syphilis. Person may be able to transmit syphilis through sexual exposure during the first year or two of untreated infection (2). Syphilis is a systemic disease, treponemes spread via the blood stream during the incubation period and women may transmit infection to their foetus in utero. Women remain potentially infectious to the foetus for many years, although risk of infecting a foetus declines gradually during the course of untreated infection. *Treponema pallidum* subspecies *pallidum* is the only pathogenic treponemal subspecies with the capacity to regularly traverse the placenta through penetrating endothelial cells via intercellular junctions. Alternatively, but less likely *T. pallidum* may gain access to the foetal circulation by first traversing the foetal membranes and infecting the amniotic fluid (3). In addition to maternal treatment, symptomatic management of the foetal complications are emerging.

We present a case of congenital syphilis that was diagnosed prenatally during the 3rd trimester of pregnancy which was associated with foetal anaemia and ascites.

Case report

A 16-year-old primigravida was diagnosed with secondary syphilis at 32 weeks of period of amenorrhoea (POA). She was from a very remote area of the country with a poor socio economic background. She was admitted to a local hospital with the complaint of abdominal pain and after detecting vulval lumps, she was tested for syphilis by the area STD clinic and found to be having a high VDRL titre of 1:16 and treatment given as secondary syphilis. The diagnosis was made on the basis of the presence of condylomata lata lesions and positive VDRL and TPPA. One dose of benzathine penicillin was given. As ultrasound findings were suggestive of foetal ascites and Doppler studies detected foetal anaemia, this mother was referred for specialized foetal management to Teaching hospital Ragama.

At presentation to STD clinic Ragama, there were no positive clinical findings other than condylomata lata lesions. Dark ground examination did not show any treponemes. The reason may be the benzathine injection given before. Her sexual history revealed risky sexual exposures with several partners and she had never attended antenatal care services. She was not given care by a primary health care worker, although it is the recommended practice to have home visits for pregnant mothers by the primary health care worker. Maternal blood group was O Rh positive and her haemoglobin level, platelet count and white blood cell count were all within normal limits. Serology test for HIV was negative.

Foetal ultrasound scan revealed a single foetus with ascites and no structural anomalies. Umbilical Doppler flow studies were normal. There was evidence of rising middle cerebral artery peak systolic velocity; initially 74 cm /sec and 87 cm/sec

subsequently which is indicative of hyper dynamic circulation in anaemia. At 32 weeks plus 3 days of POA, ultrasound guided intrauterine transfusion of 30 ml of irradiated O negative packed red blood cells were done. Foetal blood drawn during the procedure revealed haemoglobin concentration of 6.3g/dl, platelet count of 16×10^3 units/litre, and white blood cell count of 15.51×10^3 mm³ which confirmed foetal anaemia. Foetal VDRL titre was 1:64 and TPPA was positive. At that time maternal VDRL titre was 1:8 indicating active infection in the foetus.

At 33 weeks of gestation, intrauterine foetal death occurred due to congenital syphilis. Foetal body was sent for a pathological post-mortem. The dead foetus weighed 3.2 kg. Post-mortem showed Organomegaly in liver, heart, spleen and brain. Multiple tissue samples were taken from involved organs and they showed diffuse changes which were difficult to interpret. A vascular proliferation was noticed in all organs with a cellular predominance.

Patient was transferred back to the local hospital after next dose of benzathine penicillin. From there, intra-dermal implant of Levonogesterol was inserted for contraception. As our patient was a teenager, she was sent to her parents. Two sexual partners of the patient were screened for STIs and epidemiological treatment was given for syphilis.

Discussion

An upsurge in syphilis rates is reported in numerous countries. In USA an analysis of national surveillance data showed an overall increase in reported congenital syphilis to 11.6 cases per 100,000 live births in 2014, up from 8.4 cases per 100,000 in 2012 (4).

Effective prevention and detection of congenital syphilis depends on the identification of syphilis in pregnant women. It is recommended that all mothers should be tested for syphilis in the first antenatal clinic

visit. An additional testing at 28 weeks of gestation and again at delivery is warranted for women who are at an increased risk. Moreover, as part of the management of pregnant women who have syphilis, information concerning ongoing risk behaviours and treatment of sex partners should be obtained to assess the risk of reinfection. No mother or newborn infant should leave the hospital without maternal serologic status having been documented at least once during pregnancy, and preferably again at delivery if at risk.

In our case, mother was not tested for syphilis in early pregnancy due to a deficiency in healthcare system. Mother was from a very remote area of Sri Lanka and her economic and social factors have paved the way to this unexpected scenario. She was admitted to a local hospital with the complaint of abdominal pain and after detecting vulval lumps, she was tested for syphilis by the STD clinic and found to be having a high VDRL titre and treatment given as secondary syphilis.

The diagnosis of congenital syphilis can be difficult as maternal non-treponemal and treponemal IgG antibodies are transferred through the placenta to the foetus, complicating the interpretation of reactive serologic tests for syphilis in neonates. Therefore, treatment decisions frequently must be made on the basis of,

- Identification of syphilis in the mother
- Adequacy of maternal treatment
- Presence of clinical, laboratory, or radiographic evidence of syphilis in the neonate
- Comparison of maternal (at delivery) and neonatal non-treponemal serological test titres using the same test, preferably conducted by the same laboratory
- Any neonate at risk of congenital syphilis should receive a complete evaluation and testing for HIV infection

All neonates born to women who have reactive serologic tests for syphilis should be

examined thoroughly for evidence of congenital syphilis (e.g. non-immune hydrops, jaundice, hepatosplenomegaly, rhinitis, skin rash and pseudo paralysis of an extremity). Pathological examination of the placenta or umbilical cord using specific staining (e.g. silver) or a *Treponema pallidum* PCR test using a CLIA- validated test should be considered. Darkfield microscopic examination or PCR testing of suspicious lesions or body fluids of the baby (e.g. bullous rash and nasal discharge) also should be performed. In addition to these tests, skeletal survey might aid in the diagnosis of congenital syphilis (5).

Chen et al. reported a case of foetal syphilis diagnosed from hydrops and positive IgM, which led to an early treatment with penicillin (6). Secondary anaemia was detected at 28 weeks by MCA-PSV (Middle cerebral artery – Peak systolic volume) monitoring. An intrauterine transfusion was performed successfully and the newborn, delivered at 35 weeks, had no external abnormalities. This case shows us the importance of diagnosing and treating maternal syphilis early, retesting of risky mothers and taking possible interventions for foetal anaemia. Several studies have shown the effectiveness of MCA-PSV for detecting foetal anaemia, especially in foetal infections, by parvovirus B19 or CMV (7).

Zalman Lavine reported a case of a woman presenting with markedly decreased foetal movements at 29 weeks of gestation and foetal hydrops consisting of scalp oedema, hepatomegaly, ascites and polyhydramnios was noted sonographically. Investigations revealed negative antibody and RPR. Emergency caesarean section was performed due to foetal bradycardia. The hydropic neonate was resuscitated yet succumbed at 3 hours of life. Neonatal blood was RPR positive with a titre of 1:16. Postpartum re-examination of the maternal blood with serial dilutions revealed a positive RPR at 1:1024. This emphasizes that negative screening of syphilis may be seen despite overwhelming

infection, a condition that has been termed the “prozone effect” (8).

Guillaume Mace (9) reported 2 cases of congenital syphilis in France where foetal anaemia was diagnosed as a signal of congenital syphilis. First case was a 17-year-old woman referred at 33 weeks of gestation with foetal anaemia, where mother’s syphilis serology was negative during first trimester. At 34 weeks of POA, an amniocentesis was performed and foetal blood taken and in-utero transfusion done. After excluding common causes of foetal anaemia, maternal VDRL and TPPA tests were repeated and results were strongly positive. Baby delivered following emergency section due to reduced FHR. Early neonatal death occurred despite antibiotic therapy. Second case was a 27-year-old woman referred for foetal hydrops and IUGR at 26 weeks of gestation. Her VDRL and TPPA tests were strongly positive in the booking visit. For unknown reason maternal treatment was not initiated at that point and no maternal symptoms were noticed and foetal USS was normal. Upon arrival at 26 weeks an intra-uterine foetal death was observed.

Conclusions

Our case scenario clearly shows the importance of prevention of sexually transmitted infections in pregnancy which is a very comprehensive process starting from education of young males and females on STIs and HIV, preventing infections in young age groups, identification of infections in early

pregnancy and prompt treatment of mothers and treatment of the newborn. Apart from anti-treponemal drugs, intrauterine transfusion is a possible intervention in case of secondary anaemia.

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