Perinatal Treponema Pallidum: Evidence Based Guidelines to Reduce Mother to Child Transmission

Abstract

Universal antenatal screening for T. pallidum is standard in Irish maternity units. The prevalence of adult syphilis has increased in Ireland. We audited the neonatal management of infants exposed to T. pallidum from January 2005 to June 2010. Ethical approval was obtained. There were 55,058 live births during the study period. Fifty-eight women had positive serology and pregnancies that ended in miscarriage or neonatal death. A proforma was used to collect data on maternal criteria included mothers who failed to return for delivery, those who booked late and delivered in the absence of prior treatment or received suboptimal regimens are referred to genitourinary medicine clinics. Poor compliance with infection status in pregnant women. Those who have not been treated previously, who have inadequate documentation of prior treatment when receiving current treatment are referred to genitourinary medicine clinics. Documentation difficulty requiring an interpreter was a specific variable. Data were inputted into a password protected Excel database. Basic statistical analysis was carried out using SPSS 14.0.

Methods

This study received ethical approval from the National Maternity Hospital. Microbiology surveillance data identified all women with confirmed positive serology for T. pallidum over a five-year period from 2005 to 2010. Exclusion criteria included mothers who failed to return for delivery, those who booked late and delivered in the absence of screening and treatment. T. pallidum is an extremely slowly dividing bacterium. To ensure bactericidal levels of penicillin in the foetus, three doses of benzathine penicillin are administered at weekly intervals. The course should be completed at least four weeks prior to delivery. From the paediatric point of view, clinical and laboratory diagnosis is confirmed by the isolation of T. pallidum from the infant's blood, followed by culture and effective diagnostic and treatment strategy for exposed infants. To ensure that transmission has not taken place infants must be followed until completion of investigations as planned (12/15). An average of 96% of infants were diagnosed in antenatal clinics. There was a confirmed case of early syphilis in pregnancy in this last quarter with its associated transmission risk of 77-100%.

Results

There were a total of 55,058 live births during the study period. All women were routinely screened at the time of booking and 58 women had confirmed positive serology for T. pallidum. The current screening test is an enzyme immunoassay (EIA) for T. pallidum IgG. If positive additional confirmatory tests are performed: RIA for T. pallidum IgM and plasma IgA (TRA) and T. pallidum particle agglutination (TPPA). Seventeen pregnancies were excluded from this analysis for the following reasons; 11 did not return for delivery, 4 pregnancies ended in miscarriage, 1 in neonatal death and 1 mother delivered without serology. Forty-one pregnancies were included in the analysis. The incidence of positive serology was relatively static across the time period audited.

Infants were allocated to the management arms of the algorithm based on the mothers treatment history. Serological evidence of infection and the potential for maternal re-infection in pregnancy, which may be suggested, by a co-infected partner or high risk sexual behaviour. It may also be evident from the results of quantitative serology (Figure 1). Infants whose mothers received treatment in the current pregnancy were more likely to complete investigations as planned (12/15) compared to those whose mothers had received treatment in previous pregnancies (6/16) and those whose mothers were untreated (3/15). Infants across all groups were equally likely to be lost to follow up (Table 1). 21 infants were lost to follow up, 3 of who did not return for their appointment, parents refused further tests in 2 cases. In 16 cases return appointments were not arranged although indicated by the algorithm.
Discussion

This study confirms that adherence to the recommended guidelines for follow up of neonates exposed to T. pallidum in utero needs ongoing compliance audit at this institution. The group of infants most likely to have complete follow up were those born to mothers treated in the current pregnancy (Table 1). This may be due to their enhanced contact with antenatal services. In a low prevalence state, positive screening serology reflects latent infection in the majority of cases. It is accepted that the algorithm may lead to over investigation of infants however there is a strong evidence base for its implementation. Improved education of paediatricians working in maternity settings as to the basis for such recommendations may improve compliance and improve infant follow up.

Five infants required a full assessment including lumbar puncture as their mothers were not treated within four weeks of their delivery. All these infants were born at term and their mothers diagnosed at booking. Information was not sought on booking gestation however in general there should be adequate time for diagnosis and effective treatment. Referral to offsite genito-urinary medicine clinics may delay this process. On two occasions mothers stated they had completed treatment however no documentation was available. The absence of this documentation led to inappropriate or delayed investigation of infants. The CDC guidelines suggest that all women treated in pregnancy should be given a treatment card with dates and details of therapy to circumvent administrative delays.

Immigrant populations may not engage as effectively with health services for a variety of reasons. They may not be settled in one area and there may be barriers to effective communication. In this study 11 pregnancies were not included in the analysis, as the mothers did not return for delivery. There was documented communication difficulty requiring an interpreter in five cases. We have no information on the level of communication or understanding in other cases and to what extent this might have led to incomplete assessment of infants. Migrant health is an as yet undeveloped speciality in Ireland and the onus is on all of us to advocate for patients who may not be accessing necessary services. Poor compliance with the algorithm is particularly worrying in high risk populations were re-infection after initial screening is of concern. International research confirms the important contribution of T. pallidum to pregnancy loss. There were four miscarriages of undocumented aetiology in infected mothers. These foetuses were not tested for congenital infection. In the cases of the neonatal death in an exposed infant T. pallidum status was not ascertained. T. pallidum should be considered as a potential aetiological agent for pregnancy loss and neonatal death in exposed infants in order to fully quantify the disease burden in pregnancy.

In 1988 the CDC published a list of barriers to the comprehensive prenatal care necessary to prevent congenital syphilis. These included population factors such as poverty, education level and health care access, communication difficulties, the lack of readily accessible and acceptable treatment strategies, poor organisation of services and lack of understanding among patients of the need for treatment. All of these barriers were identified in our population two decades on. Local audit should be encouraged to assess compliance in individual maternity units nationwide and identify barriers. Based on this audit we would recommend increased education for neonatal and midwifery staff on the evidence based algorithm. Ideally, dedicated staff is necessary to follow pregnancies from diagnosis to infant discharge, where this is not practical enhanced documentation strategies such as chart inserts with detailed perinatal and follow up care plans should be devised. Communication of the importance of follow up should be ensured with an interpreter.

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References
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