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Case report

Case report : *Actinomyces naeslundii* complicating preterm labour in a trisomy-21 pregnancy

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ABSTRACT

Preterm birth is a global concern with considerable morbidity and mortality. Intrapartum infection is a known cause of preterm birth and *Actinomyces* infection is one of the infections contributing to preterm birth. We report a case of preterm birth of a trisomy-21 neonate to a mother with positive *Actinomyces naeslundii* from an intra-operative placental swab sample and discussed the relationship of this bacteria and preterm delivery, and the role of postpartum antibiotics use in this case.

Introduction

Preterm birth is a global health concern that affects up to one in ten pregnancies worldwide [1]. Much research to identify the causes of preterm birth was done to reduce neonatal morbidity and mortality [2,3]. Intrapartum infection is one of the causes and there are extensive studies on intrapartum infections and their treatment to prevent preterm birth [2,4–9].

Actinomyces species is one of the organisms linked to preterm birth [2] and there are many species of actinomyces present on the human body. *Actinomyces naeslundii* is a gram-positive, non-spore-forming, facultative anaerobe usually found as commensals in the human oral cavity. Clinical actinomyces infection commonly involves the cervicofacial area, rarely affects the thoracic, abdominal, and pelvic organs. Pelvic actinomycosis is reported among women with a long duration of intrauterine device (IUCD) use [1]. Actinomycosis is associated with cervical cerclage, dental abscesses, appendicitis, renal actinomycosis, and ovarian abscesses among pregnant women [2]. Actinomyces infection in pregnancy is rare and is linked to preterm deliveries [2]. There is however no evidence of actinomyces causing trisomy-21 as it is in our case.

We report a case of pelvic *Actinomyces naeslundii* with preterm delivery at 32-weeks gestation which coincidentally is a trisomy-21 baby.

Case report

A 37 years old lady, gravida three para two at 32 weeks' gestation, was apparently well prior to admitting to the labor room with increasing contraction pain. She did not have fever, leaking liquor, abnormal vaginal discharge or bleeding. She had two previous lower segment caesarean sections (LSCS) at term gestation because of poor progress during labor in years 2013 and 2017 respectively. Both surgeries were uneventful, and both children are well. She was not using an IUCD, or any other form of contraception and no cervical smear done prior to conception. She had no multiple sexual partners. At the presentation, she was afebrile with unremarkable physical examination, no uterine tenderness, and good dental hygiene. The gravid abdomen demonstrated a fetal breech position. Vaginal examination revealed an unremarkable cervix and os opening of seven centimeters with intact, bulging membrane. A high vaginal swab was taken which did not grow any organism. Cardiotocography showed pathological deceleration. Hence, the patient was subjected to an emergency lower segment caesarean section (LSCS) for breech presentation in labor. Her blood investigations revealed a high white cell count of 23.1 $\times$ 10^9/L (Neutrophil: 89.3 %, Lymphocyte: 8.6 %). The LSCS was uneventful, placenta was complete and normal in appearance, weighed 454 g, and a swab

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taken in the operating room for culture. A 1.55 kg vigorous girl was born with an APGAR score of 10, subsequently nursed in a neonatal intensive care unit (NICU) for prematurity. Empiric antibiotics (benzylpenicillin and gentamicin) were given for the newborn for presumed sepsis, given maternal leukocytosis and neonatal coagulopathy with mild leukocytosis (PT: 18.6 s; INR: 1.7; APTT: 86.3 s; TWC: 11.8 $\times$ 10^9/L (Neutrophil: 50.6 %, Lymphocyte: 39.7 %). The neonate was afebrile, not septic and her blood culture did not grow any organism. Her dysmorphism (hypertelorism with low set ears, polydactyly of the left hand, and protruding tongue) prompted a karyotyping study that confirmed Down syndrome. The neonate also had subclinical hypothyroidism.

Postoperatively, the mother had an uneventful 3-day stay in the hospital. She was prescribed a week's course of cefuroxime and metronidazole upon discharge. At a postnatal clinic review one week later, she was well with no fever or abnormal vaginal discharge, and the LSCS wound was healing well. Intraoperative placenta swab culture returned *Actinomyces naeslundii*. She did not receive antibiotic treatment during this visit as she did not demonstrate any symptom or sign of infection. She remained well during a subsequent review one month later.

Discussion

This case highlights that intrauterine *Actinomyces naeslundii* is possibly associated with preterm birth. The source of infection in this case is unclear as there are no IUCD use or poor dental hygiene, which were known risk factors [1,2]. There was no evidence of maternal urinary tract infection, or sexually transmitted infection, and she had no history of diabetes, smoking, or alcohol consumption.

Subclinical chorioamnionitis caused by *Actinomyces naeslundii* is possible in this case, leading to preterm delivery. There was raised maternal TWC and the infant was having coagulopathy at birth, which could not be explained by any other reason but infection. The blood cultures of the newborn returned negative. However in view that no specimen was taken for cultures from the reproductive tract before conception or intrapartum, we cannot conclude at what stage of conception did this organism began to appear.

The relationship between *Actinomyces naeslundii* and Down's syndrome is somewhat far-fetched as we have no evidence of the mother having this bacteria in her reproductive tract before conception and there was no literature showing such incidences. Furthermore, the age of the mother is a risk factor for Down's syndrome.

The empiric use of antibiotics for the mother post LSCS, with no clear indication or evidence of infection, except for maternal leukocytosis is controversial. There was also no literature on the optimal antibiotic of choice or recommended duration for *Actinomyces naeslundii* infection in the reproductive tract post delivery.

In summary, this case may demonstrate the link between *Actinomyces naeslundii* and preterm birth. Coincidentally this neonate is having Down syndrome. Judicious and correct use of antibiotics at the post-partum period should be emphasized and further studies on the specific treatment for colonized or infected reproductive tract need to be done. Intrapartum diagnosis and treatment of *Actinomyces naeslundii* could possibly prevent preterm birth.

Authors' contributions

HCO, ACKL, DSWN conceptualized and drafted the initial report. All authors reviewed and
approved the final report.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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