CASE REPORT

Infant born with Robert's syndrome without prenatal care in a developing nation

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SUMMARY

Maternal and child well-being during pregnancy can be attributed to receiving optimal prenatal care. However, in developing nations, there are many barriers to receiving this. We present a primigravid female aged 29 years with severe abdominal pain. She was in active labour at 40 weeks and completely unaware of her pregnancy; hence, she did not receive any prenatal care. The baby was born with significant birth deformities that were consistent with Robert's syndrome. Although early detection could not preclude the development of this disorder, proper care would have facilitated in receiving genetic counselling and proper understanding of the prognosis. In this case, we discuss the various barriers to receiving prenatal care and measures taken for improvement in developing nations.

CASE PRESENTATION

A primigravid female aged 29 years residing in a poor urban district in Mexico presented to the emergency room with symptoms of severe diffuse abdominal pain. The pain began several hours prior to her encounter and gradually became more frequent with increasing intensity. Review of symptoms was otherwise unremarkable. She also had vaginal spotting and weight gain for the past 8 months. She denied history of diabetes mellitus, hypertension, heart disease and other medical diseases. Family history was reviewed and unremarkable. She denied cigarette smoking, alcohol abuse and substance abuse. She was of a very low socioeconomic background, and unemployed. She denied history of recent sexual encounters, multiple sexual encounters, consanguinity, fevers, radiation exposure and thalidomide exposure. She had never received any medical care, as she was previously in a good state of health.

Physical examination was significant for distended abdomen with fundal height of 30 cm and fetal heart tones, consistent with pregnancy. Vaginal examination revealed complete dilation and effacement of the cervix. Abdominal ultrasound revealed fetal heart rate of 107 bpm and gestational age of 40 weeks. An emergency caesarean section was performed as she developed late decelerations and the fetus presented in pelvic presentation.

The infant was a male weighing 2170 g with an APGAR score of 4/6. Physical examination revealed hypertelorism, prominent nasal bridge, nasal alar hypoplasia, oblique palpebral fissures, cleft palate, retrognathia, upper and lower limb phocomelia, hypoplastic limbs (figures 1–4) and oligodactyly (figure 5). Blood glucose was 54 mg/dL, creatinine

was 0.5 mg/dL and calcium was 4.5 mEq/L. Chest radiograph revealed cardiomegaly (figure 6). Echocardiogram was not performed. Cytogenetic analysis confirmed Robert's syndrome with a locus assigned to chromosome 8p21.1. The infant was managed in the neonatal intensive care unit with supportive measures. He was then transferred to a tertiary care hospital for further management on the second day of life.

GLOBAL HEALTH PROBLEM LIST

- Improper prenatal care can result in increased maternal and fetal morbidity and mortality. Women with high-risk pregnancies are more susceptible to maternal mortality and congenital malformations in infants.
- Developing nations face many challenges with shortages of resources and shortage of physicians, midwives and maternity hospitals. This can preclude access to receiving prenatal care.
- Low socioeconomic status and poor education can result in poor awareness and inadequate nutritional intake during pregnancy.
- Traditional and cultural factors, including birth performed by local birth attendants or family members, can influence women not to receive prenatal care.

GLOBAL HEALTH PROBLEM ANALYSIS

Prenatal care, or antenatal care, is preventive care women receive to prevent, detect and treat health problems during pregnancy. It is considered a crucial element in the prevention of maternal and infant mortality worldwide. The WHO recommends at least 4 prenatal check-ups throughout the course of pregnancy.¹ However, only 70% of women receive prenatal care worldwide, while 95% of women in industrialised countries receive prenatal care.² In this case, our patient did not receive any prenatal care because she was unaware of her pregnancy.

The WHO reports that only 29–36% of African, 20–61% of Asian and 69–89% of South American women receive prenatal care.³ Maternal mortality is 3–4 times more likely in women who do not receive prenatal care. Infants born from mothers who do not receive prenatal care are three times more likely to have low birth weight and five times more likely to die, in comparison to women who receive it.⁴ Improper preconception and prenatal care can result in higher numbers of pregnancies with chromosomal abnormalities.⁵ In addition, women with high-risk pregnancies who do not receive prenatal care are at an even higher risk for mortality compared with women who do receive it.⁶

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Figure 1 Plain film demonstrating hypoplastic upper extremity and lower extremity limbs.

Figure 2 Deformed digits and hypoplastic extremities.

Figure 3 Hypoplastic upper and lower extremities.

Figure 4 Plain film of hypoplastic humerus.

Low socioeconomic status can cause many challenges for pregnant women. In addition, when the government does implement programmes to aid low-income families, poor regulation can lead to theft in underdeveloped nations where corruption prevails. In a Canadian study (N=76 440), low income was associated with higher rates of gestational diabetes, preterm labour, small-for-gestational age live births and postnatal death.⁷ Many of these conditions are preventable with proper prenatal care. However, cost of care often prevents women from receiving appropriate interventions during pregnancy. In Mexico, an incentive-based welfare scheme called Progresa, in which poor families received cash transfers if they attended preventive health services, prenatal clinics and schools.⁸ Disparities of socioeconomic status in our patient resulted in lack of awareness of prenatal care and caused her to overlook its importance.

Proper education and awareness of appropriate treatments and preventive measures carries an important role during pregnancy. A study by Dai *et al*⁹ found that women with higher

education who receive prenatal care had a protective effect on the risk of low birth weight. Another study in eastern Sudan found that younger teenage women who did not complete secondary education did not seek prenatal care, compared with older women.¹⁰ Measures have been taken to increase awareness and improve education to receive preconception and prenatal care. Alcalay *et al*¹¹ utilised various means of prenatal care to women with low incomes through messages broadcasted on posters, calendars, brochures and radio songs in Tijuana, Mexico. Fotso *et al*¹² found that broad actions to increase women's autonomy, improving livelihood of households and promoting young women's education and awareness to positively impact the perception of maternal healthcare in resource-poor urban locations.

Traditional and cultural practices often prevent women from receiving the recommend prenatal care. Communities tend to follow their cultural beliefs that traditional birth attendants should conduct pregnancy and delivery. In certain cultures,

Figure 5 Oligodactyly.

Figure 6 Plain film demonstrating cardiomegaly.

pregnancy is regarded as a healthy state of being, hence medical and preventative care is not required. Identified barriers across different cultures include overlooking warning signs of pregnancy, harbouring a negative attitude towards their pregnancy, not taking prenatal vitamins because prior births were normal without care, fear of doctors, fear of parents finding out about adolescent pregnancy, fear of deportation of illegal immigrants, refusal to change their habits of smoking or drug abuse.¹³ One study in Nigeria found that cultural beliefs were so strong, that even educated women did not seek prenatal care.¹⁴ Interventions to overcome these barriers include training of indigenous health workers to further educate women on proper care during pregnancy, implementation of awareness programmes, providing psychosocial support and education on importance of allopathic medications.^{4 13 15}

We have identified important barriers to receiving prenatal care and interventions undertaken to help decrease

consequences of poor care. Worldwide, infant and maternal mortality has considerably decreased from 1990 to 2015.¹⁶ This will likely continue to decline as healthcare becomes more affordable, approachable and accepted throughout the world for pregnant women. Although Robert's syndrome could not be prevented from occurring in our patient, genetic counselling and screening could have prepared the mother for the sequelae of emotional distress, and facilitated understanding of her baby's condition and prognosis. Early detection would also allow for consultation and care from a paediatric team to prepare sufficient materials and support for the malformed infant.

Patient's perspective

- ▶ I was very surprised to learn that I was pregnant. After I delivered my baby, I was extremely worried for his health, as the doctors told me his condition will not allow him to survive. I was told that he will pass away in the next few hours. I informed the doctors to make him as comfortable at peace if possible.
- ▶ We were very surprised when the baby lived for more than 2 days. We were transferred to another hospital that took care of small infants like my son. If I knew I was pregnant and had better care, I might have been more knowledgeable to handle this.

Learning points

- ▶ Prenatal care is a vital element in the prevention of maternal and infant morbidity and mortality, early identification of chromosomal abnormalities and treatment of medical diseases that can complicate pregnancy.
- ▶ Poorly educated women and low-income populations have higher rates of maternal and infant morbidity and mortality secondary to receiving poor prenatal care, compared with educated and higher income populations.
- ▶ Although there has been a considerable decrease in maternal and infant mortality worldwide, traditions related to cultural beliefs still serve as a barrier to receiving prenatal care and needs further intervention to increase preconception and prenatal awareness.
- ▶ The implementation of assistance programmes by the government for low-income people is helpful, but these types of programmes should be well regulated because corruption prevails in many underdeveloped countries, where there is lack of personnel and material, resulting theft of economic resources.

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