Short reports


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### Congenital varicella resulting from infection during second trimester of pregnancy

Congenital malformation of the newborn infant due to maternal varicella in early pregnancy has rarely been reported. Such a case is presented here with a review and discussion of published reports.

**Case report**

The infant was the third child of a 20-year-old woman. Her first pregnancy in 1970 resulted in the birth of an infant of 36 weeks’ gestation who died at 8 days of age from disseminated herpes simplex infection, confirmed by liver histology and viral culture. The mother was noted to have exophthalmos antenatally, and vulvar herpes shortly after delivery. Her second pregnancy in 1972 resulted in a light-for-dates infant now alive and well. During this pregnancy she developed a subacute thyroiditis (de Quervain’s) at the 15th week, which resolved spontaneously over the next 3 weeks, her thyroid function returning to normal.

Her third pregnancy in 1974 was complicated at 20 weeks by generalized varicella lasting approximately 10 days. 2 weeks after the start of this illness she was admitted because of undiagnosed abdominal pains. She had no vaginal bleeding and was discharged 12 days later, but was readmitted at 30 weeks because of poor fetal growth and her bad obstetric history. Normal fetal growth had been recorded clinically until the time of her varicella infection and urinary total oestrogens and ultrasonic fetal biparietal diameters suggested poor fetal growth thereafter. The pregnancy ended with the spontaneous onset of labour at 34 weeks, a female infant being delivered by Wrigley’s forceps on 13 October.

The infant’s birthweight was 1580 g, length 39 cm, and head circumference 29.8 cm. Apgar scores were 7 at 1 minute and 10 at 5 minutes. Gestational assessment using Dubowitz’s scoring system (Dubowitz, Dubowitz, and Goldberg, 1970) was 34 to 35 weeks, weight being below the 10th centile. Examination showed a left microphthalmia and enophthalmia, crusted vesicular skin lesions on the left hand and forearm, and a healed scar on the left side of the abdomen. She was initially nursed in an incubator, mild symptoms of respiratory distress settling over the first 48 hours. A maximum serum bilirubin of 144 μmol/l was recorded on the third day. Assisted feeding by nasogastric tube was required for the first 4 weeks. A top-up transfusion of 30 ml of packed red cells was given at one month of age, when she had mild dyspnoea associated with a haemoglobin levels of 9.8 g/dl. Subsequent progress was uneventful.

The skin lesions healed with minimal scarring and good function of the left hand over the first 3 to 4 weeks. Examination of the eyes at 7 weeks of age showed corneal diameters of 10 mm on the right and 5 mm on the left. The right fundus appeared normal but the left was obscured by a central cataract. Neurological and developmental assessments have been otherwise normal up to 6 months after birth when outpatient follow-up was lost due to nonattendance.

**Investigations.** The viral titres obtained in the mother’s and infant’s serum are compared in the Table. An initially raised IgM of 0.48 g/l was found in the infant’s serum (11 days after birth) and antivaricella-zoster IgM shown on a sucrose gradient. Skull and chest x-rays were normal. Peripheral blood film apart from the above-noted anaemia was normal. A thyroxine level and T3 index, obtained because of the mother’s

### TABLE

**Viral titres**

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*Serology sample separated by 10- to 14-day intervals.

†Low titre in the mother is compatible with infection 15 weeks earlier.
Exophthalmos and previous thyroiditis, were also normal for the infant's age.

Discussion

The incidence of varicella during pregnancy is low, most women having acquired immunity during childhood. The minimal incidence diagnosed on clinical criteria and serological confirmation reported by Sever and White (1968) is 0.5/1000 pregnancies, compared with 0.8/1000 for rubella. Subclinical rubella infection makes the latter figure a considerable underestimate. The observed incidence may rise to 20/1000 pregnancies during rubella epidemics.

Congenital and neonatal varicella, although uncommon, has been well documented and most recently reviewed by Newman (1965). Most reports have recorded either varicella acquired by the fetus during the last 2 to 3 weeks of pregnancy from maternal viraemia, or postpartum infection of the neonate whose mother was still infectious. Clinical illness in the neonate within 10 days of birth is prenatally acquired, the course being similar to varicella in later life but with a higher mortality of about 20% (Newman, 1965).

Reports of varicella in early pregnancy as a cause of congenital abnormality are few and are somewhat conflicting. Siegel, Fuerst, and Peress (1966) showed no significant increase in early spontaneous abortions, in women who had contracted varicella, unlike those who had had hepatitis, rubella, or mumps. Fox, Krumbriegel, and Teresi (1948) and Brunell (1967) followed up a total of 11 pregnancies complicated by varicella during the second and third trimesters and found no abnormalities in the newborn infants.

However, isolated cases of congenital abnormalities following varicella infection during early pregnancy have been reported. Lafonet and Lynch (1947) described a case following infection in the 8th week of pregnancy, in which the infant showed paralysis, muscular atrophy, defective bone formation, and talipes of the right leg, pilonidal sinus, anal and vesical sphincter incompetence, cerebral atrophy, cerebellar aplasia or hypoplasia, and bilateral optic atrophy. Rinwik (1969) described a case following infection in the 15th to 16th week of pregnancy which had some similarities to the previous case, with zosteriform skin lesion, underdevelopment of the right leg with talipes, neurological changes, and encephalitis. Savage, Moosa, and Gordon (1973) and McKendry and Bailey (1973) separately described 2 light-for-dates infants with localized skin scarring and limb hypoplasia associated with other neurological defects following infection during the first trimester of pregnancy. Savage et al., by electromyography and nerve-conduction studies, showed evidence of denervation to the involved limb. They suggest the muscular-skeletal hypoplasia and other neurological abnormalities described can be related to the neurotropic properties of the varicella-zoster virus. Duehr (1955) described 2 infants following herpes zoster infection in the 3rd and 4th months of pregnancy with microphthalmia, cataract, talipes, and mental retardation. Feldman (1952) suggested that latent infection of the neonate may occur without obvious abnormality at birth following herpes zoster in early pregnancy.

Herpes zoster in pregnancy is an uncommon illness in young women and is sometimes associated with abnormal immune mechanisms. The mother of our infant has an obstetric history suggestive of abnormal or defective immune mechanisms. She has a slightly low IgG level of 6.9 g/l, a weak non-specific enzyme red cell antibody and anti HL-A 2 antibody. Her peripheral blood picture and complement levels are normal, and screening for autoimmune factors and antibodies negative. Unfortunately she refuses investigation of other cellular immune mechanisms, which may be relevant to her obstetric history and abnormalities produced in her last child.

Therapeutic termination of pregnancy after early rubella infection is now considered acceptable practice. Lack of adequate information about varicella infection in early pregnancy prevents any definite recommendation for the termination of such an 'at risk' pregnancy. The collection of additional information may allow the risk to the fetus to be estimated in the future.

Summary

An infant with left microphthalmia, enophthalmia, and cataract with scattered zosteriform skin lesions from maternal varicella at 20 weeks' gestation is described. The mother's abnormal obstetric history is discussed and published reports on congenital and neonatal varicella reviewed.

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References


Blue double light

Improved method of phototherapy

Phototherapy with white light reflected onto one side of the patient has reduced the number of exchange transfusions in newborn infants with rhesus haemolytic disease (Reid et al., 1972; Roth-Maintz and Schellong, 1973; Shennan, 1974; Möller and Ebbesen, 1975). Phototherapy with white light reflected onto both sides of a jaundiced newborn infant has been stated to be highly effective (Isenberg and Fisch, 1973). We have developed a system of reflecting blue light onto both sides of an infant with the hope of further reducing the number of exchange transfusions necessary, and have compared the efficiency of this blue double light with traditional single white light in newborn infants with rhesus haemolytic disease.

Methods

The blue double light was arranged with 6 blue fluorescent bulbs (Westinghouse, special blue, F20T12/BB) 53 cm above and 48 cm beneath a translucent Perspex plate and an airfilled, translucent, disposable mattress (see Fig.). Conventional white light therapy was provided from a unit of 6 fluorescent bulbs (Philips TL 20W/33) 60 cm above mattress level (Möller and Ebbesen, 1975).

Phototherapy was given continuously from the first 1–3 hours of life until serum bilirubin levels fell consistently for at least one day below 204 μmol/l (11.9 mg/100 ml). Capillary blood was collected at 3- or 6-hour intervals for determination of serum bilirubin levels by a spectrophotometric method. Exchange transfusions were performed soon after birth if cord serum bilirubin levels exceeded 68 μmol/l (4.0 mg/100 ml) or cord blood Hb levels were less than 11.9 g/dl. These exchange transfusions were called early exchange transfusions and were performed within the first 12 hours of life. Exchange transfusions performed after that period were called late exchange transfusions and were carried out in all cases if serum bilirubin levels reached 340 μmol/l (20 mg/100 ml). The umbilical vein was catheterized and the infant’s blood was exchanged with 170 ml/kg citrated, freshly-drawn blood. Thereafter kanamycin was administered for 3 days.