

## Case reports

# Generalised Coxsackie A9 infection in a neonate presenting with pericarditis

M TALSMA, M VEGTING, J HESS

*From the Department of Pediatrics, Division of Pediatric Cardiology, University Hospital, Groningen, The Netherlands*

**SUMMARY** Coxsackie A9 virus was isolated from a neonate presenting with a massive pericardial effusion. Delivery had occurred after maternal infection. The virus was cultured from the cerebrospinal fluid, urine, and faeces of the infant and from the faeces of the mother and a sibling. Despite signs of generalised infection with pericarditis, meningitis, pneumonitis, and hepatitis, recovery was complete.

Enteroviral infections in neonates are relatively common. Of the infections caused by the enterovirus group over 90% are due to echoviruses and Coxsackie B viruses and a small minority to Coxsackie A viruses. Although seldom encountered, this latter virus may cause a severe illness with a fatal outcome. Even then, cardiac involvement is rare.<sup>1</sup>

We report the case of a neonate with generalised Coxsackie A9 viral infection presenting with a massive pericardial effusion who fully recovered.

### Case report

A 6 day old male infant was referred because of progressive cardiomegaly. The infant was born after a pregnancy of 33 weeks' gestation. The mother was 28 years old, gravida 2. In the week before delivery both the mother and a sibling had pyrexia, diarrhoea, and a transient rash on the trunk. Labour started, and after three days a male infant was born (weight 2.4 kg) despite the intravenous administration of ritodrine hydrochloride. The Apgar scores were 5 and 6 after one and five minutes respectively. Because of respiratory distress with hypercapnia and acidosis the child had to be intubated and ventilated with a high inspired oxygen content. An arterial umbilical catheter was inserted and ampicillin and gentamicin were

given prophylactically. After 40 hours the infant was extubated. Because of an inspiratory stridor and possible glottal oedema dexamethasone was given intravenously. At the age of 5 days the infant's condition suddenly deteriorated. His temperature rose to 38.5°C, and he had diarrhoea and a generalised rash. Sepsis was suspected and blood cultures were performed. Antibiotic treatment was changed to penicillin and chloramphenicol. On the sixth day a chest radiograph showed cardiac enlargement.

On admission to this hospital the child was pink and breathing 30% oxygen. He was slightly tachypnoeic. The peripheral arterial pulses were normal, and there was no pulsus paradoxus. Systolic blood pressure in the right arm was 75 mm Hg. No murmurs were heard, and the heart sounds were clear. Hepatomegaly was present (3 cm below the right costal margin). Neurological examination was normal and no rash was seen.

The following laboratory data were obtained: white blood cell count 15 300/mm<sup>3</sup> with 78% polymorphonuclear leucocytes and 11% band forms. Arterial blood gas analysis showed pH 7.22, PCO<sub>2</sub> 7.86 kPa (59 mm Hg), PO<sub>2</sub> 8.93 kPa (67 mm Hg), and sodium bicarbonate concentration 22 mmol/l. Electrolytes and urea and creatinine concentrations were within normal limits. Serum aspartate aminotransferase and serum alanine aminotransferase activity was normal on admission but raised after two days (103 IU/l, and 111 IU/l respectively). Creatine phosphokinase concentration was normal (43 IU/l). The cerebrospinal

Requests for reprints to Dr M Talsma, Department of Pediatrics, University Hospital, Oostersingel 59, 9713 EZ Groningen, The Netherlands.

fluid contained 110 cells/mm<sup>3</sup> with 37% polymorphonuclear leucocytes and 43% monocytes. Cultures of cerebrospinal fluid, blood, and urine for bacteria remained negative. The electrocardiogram was normal. Chest radiographs showed severe enlargement of the heart. The lungs were clear. Echocardiography showed a massive pericardial effusion. Cardiac contractility was not impaired. Coxsackie A9 virus was isolated from the cerebrospinal fluid, urine, and faeces of the infant and also from the faeces of the mother and a sibling. Serial serological examination of both mother and sibling showed an appreciable rise in neutralising antibody titres against the isolated virus to 1/355 and of the infant to 1/2818.

During the following week the child fully recovered, the tachypnoea disappeared, and the size of the heart and liver became normal. After 10 days the white blood cell count, blood gas analysis, transaminase values, cerebrospinal fluid, chest radiography, and echocardiogram showed no abnormalities. The child was discharged. Follow up until the age of 5 months showed no abnormalities. A neurological examination was normal.

## Discussion

Since Coxsackie virus was isolated by Dalldorf and Sickles in 1948 from humans with central nervous system disease,<sup>2</sup> there have been few reports of serious neonatal Coxsackie A9 infections. In older children and adults this viral strain has been recovered from the stools of healthy subjects and has been associated as a causative agent with several illnesses ranging from mild disease, such as a moderate fever and rash, to severe cardiac disease.<sup>3</sup> Both single and epidemic infections have been reported. In contrast to other strains, however, the aetiological role of Coxsackie A9 virus in patients with pericarditis or myocarditis with a non-fatal outcome has not been proved. In infants Coxsackie A9 virus infection has been related to aseptic meningoencephalitis, hepatitis, and pneumonia.<sup>4</sup> In neonatal infections the route of transmission has not been established. Flamm demonstrated in rabbits that when injected intravenously Coxsackie A9 virus reached the blastocyst early and the amniotic fluid later in pregnancy.<sup>5</sup> Such transplacental transmission is supported by the fact that maternal Coxsackie A9 infection during pregnancy results in a higher incidence of congenital malformations of the digestive tract.<sup>6</sup>

In our patient the history suggested transplacental transmission, but since the incubation time for enteroviral disease is one to 10 days this could not be

confirmed. Generalised infection in infants usually has a fatal outcome. Our patient had meningitis, and since there was no cardiac tamponade, the hepatomegaly and the rise in transaminase activity indicate viral infection of the liver as well. Furthermore, the respiratory acidosis on admission and the persistent hypercapnia suggest a pneumonitis. The virus was isolated from the urine, stools, and cerebrospinal fluid, and a fever and a rash occurred. In addition, there was cardiac involvement, although this was restricted to the pericardium since signs of myocarditis were not present (normal electrocardiogram, normal contractility on echocardiography, and normal values of creatine phosphokinase). This probably resulted in a relatively benign course of the disease.

Since treatment against the Coxsackie A9 virus is not available, it must be symptomatic, such as increased inspired oxygen concentrations in case of pneumonitis and fluid restriction and diuretics in cases of cardiac failure due to myocarditis. The benefit of giving digitalis is debatable because the diseased myocardium may have an increased and unpredictable sensitivity for this drug, resulting in severe arrhythmias. To avoid circulatory failure due to cardiac tamponade in infants with pericarditis, pericardiocentesis must be performed. In our patient there was a massive pericardial effusion but no signs of tamponade. Because of the risks of pericardiocentesis in infants, this procedure was not performed on diagnostic grounds either.

Isolation of a patient with a suspected Coxsackie infection has been recommended.<sup>6</sup> Nevertheless, because of the high rate of subclinical infections and an often prolonged period of virus excretion (up to three months) the efficacy of this measure may be questionable. The unusual clinical presentation of our patient may have been influenced by the administration of dexamethasone before admission, since corticosteroids may aggravate the course of the infection and are therefore contraindicated.<sup>3</sup> At the time of administration, however, a viral infection was not suspected. The infection could have had a biphasic course.<sup>4</sup> If so, the first phase in our patient would have been respiratory disease followed by apparent recovery, and the more severe second phase pericarditis, meningoencephalitis, and hepatitis.

Although complete recovery in our patient appears likely, long term follow up may indicate possible sequelae associated with meningitis and pericarditis. Neonatal enteroviral infections with cardiac involvement invariably have a fatal outcome due to myocarditis. This case illustrates that generalised Coxsackie A9 infection in a neonate may present with pericarditis in the absence of myocarditis, thus explaining the benign course.

**References**

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