Paediatric Rheumatology/Series Editor: P. Woo

Letters to the Editor

Rheumatology 2001;40:939–940

A normal ECG at birth does not exclude significant congenital cardiac conduction disease associated with maternal anti-Ro antibodies

Sir, Isolated congenital complete heart block (CCHB) is a rare complication of pregnancy, strongly associated with maternal anti-Ro/SSA antibody, which is found in up to 91% of cases [1]. The damage occurs during fetal development, heart block generally first being detectable between 16 and 24 weeks of gestation. Only approximately 2% of pregnancies in women with the anti-Ro antibody are complicated by CCHB [2]. Even in women who have had children with CCHB the risk of recurrence is only 16% [1], despite the stability of the antibody over time. One possible explanation is that subclinical damage to the conduction pathway may be occurring in clinically unaffected siblings.

We have recently had a case which illustrates that even clinically significant cardiac conduction disease may not be apparent at birth. We report a woman with Sjögren’s syndrome who has had three children. Her first pregnancy, in 1993, was complicated by a Caesarian section as the fetal heart rate could not be heard and the fetus was small for the dates. At birth it was noted that the newborn girl had CCHB. She has had an endocardial pacemaker since the age of 2 yr and is now growing normally.

The mother had been symptomatic since her late teenage years, with recurrent parotid swelling, joint pains and dry eyes. At the time of the delivery of her daughter she was seen in a connective tissue disease clinic. Keratoconjunctivitis sicca was confirmed by Schirmer’s test, and serology showed a positive anti-Ro antibody and positive rheumatoid factor at 1:64 but a negative anti-nuclear antibody and anti-double-stranded DNA antibodies. A diagnosis of Sjögren’s syndrome was made.

The second pregnancy, in 1994, was uneventful. There was no evidence of heart block during pregnancy and she had an elective Caesarian section at 39 weeks. This boy remains well with no electrocardiographic evidence of a conduction defect.

The third pregnancy, in 1997, was also uneventful, with no cardiac conduction abnormalities detected in utero despite frequent ultrasound monitoring. A boy was born by elective Caesarian section at 39 weeks, and weighed 6 lb 10 oz (3008 g). At birth he was transferred to the neonatal unit for assessment in view of his sister’s CCHB. An ECG showed no evidence of conduction abnormality and the heart rate was 135 beats/min. At 2 yr of age the child had an ECG performed which showed Mobitz type I heart block (Fig. 1). A 24-h tape showed first- and second-degree heart block with a minimum heart rate of 44 beats/min. He has always been asymptomatic and remains so.

Affinity-purified anti-SSA/Ro antibodies from the serum of mothers of children with CCHB have been shown to cause heart block in Langendorff preparations of the human fetal heart [3]. Mice vaccinated with the Ro antigen produce pups with CCHB [3]. Thus, it would appear that the anti-Ro antibody is pathogenic. However, if one proposes that the anti-Ro antibody is pathogenic in CCHB, it needs to be explained why the majority of anti-Ro antibody-associated pregnancies are not affected.

Buyon et al. [4] have looked at fine specificities of antibodies and shown that the anti-52 kDa Ro antibody is more specific in the prediction of CCHB [4]. The additional presence of anti-La antibodies increased specificity but reduced sensitivity. The association between these antibody subsets and CCHB, although significant, was still not strong enough to explain the pathology of the disease.

However, the association remains strong and has led to two working hypotheses. First, CCHB may be due to another associated antibody that has titres which vary over time. Secondly, it has been proposed that a second event, probably fetal, occurs to make the fetal heart susceptible to anti-Ro antibodies crossing from the mother’s circulation. HLA typing in children with and without CCHB has produced conflicting results. However, because even monozygotic twins may be discordant for CCHB [5], it is difficult to implicate genetic susceptibility or even an environmental event in the pathogenesis.

This case draws attention to a third hypothesis: that a proportion of cases are subclinical. In the literature there are reports of first- and second-degree heart block occurring in humans, and the degree of heart block may vary perinatally [6]. In addition, cardiomyopathy may occur, demonstrating that the process is not confined to the conduction pathways. In the mouse model of CCHB, varying degrees of conduction abnormality occur in pups from the same litter [3].

In clinical studies to date, unless a child has been found to have overtly abnormal conduction he or she has been assumed to have no anti-Ro antibody-associated cardiac damage. Generally, this relates to assessment at birth. The present case shows that even clinically...
significant conduction pathway damage may not be apparent at birth.

The authors are supported by a grant from the British Heart Foundation.

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Accepted 18 May 2000

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