Nigerian Journal of Paediatrics 1981; **8** (**4**): 103-106

Fatal Supraventricular Tachycardia in a 13-Month old Infant

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Summary

Fadahunsi O, Mordi VPN and Ogundipe O. Fatal Supraventricular Tachycardia in a 13-month old Infant. *Nigerian Journal of Paediatrics* **1981; 8: 103.** The case of a 13-month old female child with supraventricular tachycardia and heart failure associated with atrial septal defect is reported. It is suggested that she might be an example of the chronic sustained type of ectopic atrial tachycardia. The importance of paying particular attention to heart rate in any child with cardio-respiratory distress and obtaining an electrocardiogram promptly is emphasized.

Introduction

ECTOPIC tachycardia is an uncommon phenomenon in infancy and childhood. When it does occur, it is usually the supraventricular type of paroxysmal tachycardia, recognised as the most serious of the abnormal cardiac rhythms of infancy since it causes heart failure within a few hours of onset and may cause death in 48 hours if unrecognised.[1] We report here, the first documented death from ectopic atrial tachycardia in a child seen at the Lagos University Teaching Hospital.

Case Report

OS, a female Nigerian infant, aged 13 months, was brought to the paediatric clinic during an attack of breathlessness which had already lasted 24 hours and was beginning to cause anxiety to her parents by its persistence and apparent worsening inspite of the "usual antibiotic and bronchodilator therapy".

The past history revealed that she had a normal delivery at term, and weighed 3.9 kg. Pregnancy and the early neonatal period were uneventful. She was the sixth child of normal parents, and none of the siblings had any cardio-respiratory problems. She had had several episodes of acute breathlessness before, the first in the third week of life for which she was admitted to hospital and treated successfully for "acute bronchiolitis". Following a period of apparently normal development, further attacks of breathlessness began at the age of six months and recurred with increasing frequency, culminating in the present episode. On the few occasions that medical assistance was sought, a diagnosis of "wheezy bronchitis" was assumed in the absence of definite confirmatory signs, and antibiotics and bronchodilators prescribed. Chest radiographs were

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reported as normal. A heart rate of 160 per minute was recorded on one occasion but an electrocardiogram was not done.

On examination, she was very breathless, restless and grey with a feeble pulse rate of over 200 per minute. An electrocardiogram (Fig.) confirmed the tachycardia and showed it to be ectopic in origin. She was immediately placed semi-recumbent, in an oxygen tent, given parenteral diazepam, 2mg, and the first one third of the digitalizing dose of digoxin, 0.06 mg per kg, in the first 24 hours. She appeared to improve clinically over the next few hours but died suddenly, 7 hours after admission.

Autopsy revealed an atrial septal defect of the ostium secundum type, 1.8 cm in diameter. There was moderate right atrial hypertrophy and enlargement.

Discussion

Various authors have in the past, made a distinction between simple paroxysmal atrial tachycardia occurring mainly in young infants below the age of six months and chronic supraventricular tachycardia affecting the older child. Simple supraventricular tachycardia is estimated to occur in about one in twenty-five thousand children.[2] Radford, Izukawa and Rowe[3] recently drew attention to instances of severe cardiac failure at birth from congenital paroxysmal atrial tachycardia and of their ten cases, one had an associated ventricular septal defect. Three of six infants with "near miss' sudden infant death reported by Keeton *et al*[4] were found to have simple paroxysmal atrial tachycardia. None had associated congenital heart disease.

Chronic supraventricular tachycardia is a rarer phenomenon and tends to affect the older child. Morgan and Nadas[5] reported 10 cases with chronic repetitive or persistent tachycardia. Keane, Plauth and Nadas[6] reported 16 cases collected over a period of 28 years, while Jacobsen *et al*[7] have reported 9 cases, eight of whom were aged between 8 months and 12 years. These authors have emphasized its occurrence in older children as well as the rarity of associated congenital or other heart disease. A characteristic feature of the condition is the variability of the heart rate, occurring either as a result of frequent interruption by normal sinus rhythm in the "repetitive" type, or the mysterious frequent change in rate in spite of persistence of the ectopic focus in the "sustained" type.[5 6 7] Moderate tachycardia of less than 200 per minute occurs in most instances but infrequent interruption by rates more than 250 per minute also occurs. Jacobsen and colleagues[7] are of the view that the favourable long-term prognosis in these children from the point of view of frequent attacks of cardiac failure, in contrast to infants with simple paroxysmal tachycardia, is a result of this moderation in heart rate.

Certain features in our patient suggest that she might have suffered from the chronic sustained type of supraventricular tachycardia. Although one electrocardiogram was recorded only during the terminal illness, it showed a tachycardia which changed in rate from 150 per minute to 300 per minute at frequent intervals. Ectopic but supraventricular excitation foci are reflected in all the tracings by the abnormal P waves, and complete take-over by nodal rhythm coincided with the change in heart rate from 150 to 300 per minute. The history of recurrent attacks of breathlessness since the age of 18 days would suggest that the child perhaps, had supraventricular tachycardia since early life.

The autopsy in our patient revealed a large atrial defect undiagnosed during life. Atrial septal defect which was diagnosed at necropsy in our patient is one congenital malformation of the heart that is frequently associated with atrioventricular conduction disorders.[8] However, symptomatic tachyrrhythmias have only been described in adults with atrial septal defect and in 10 to 20 per cent of those whom the tachyrrhythmia contributes to the terminal heart failure, in the third or fourth decade of life.[9]

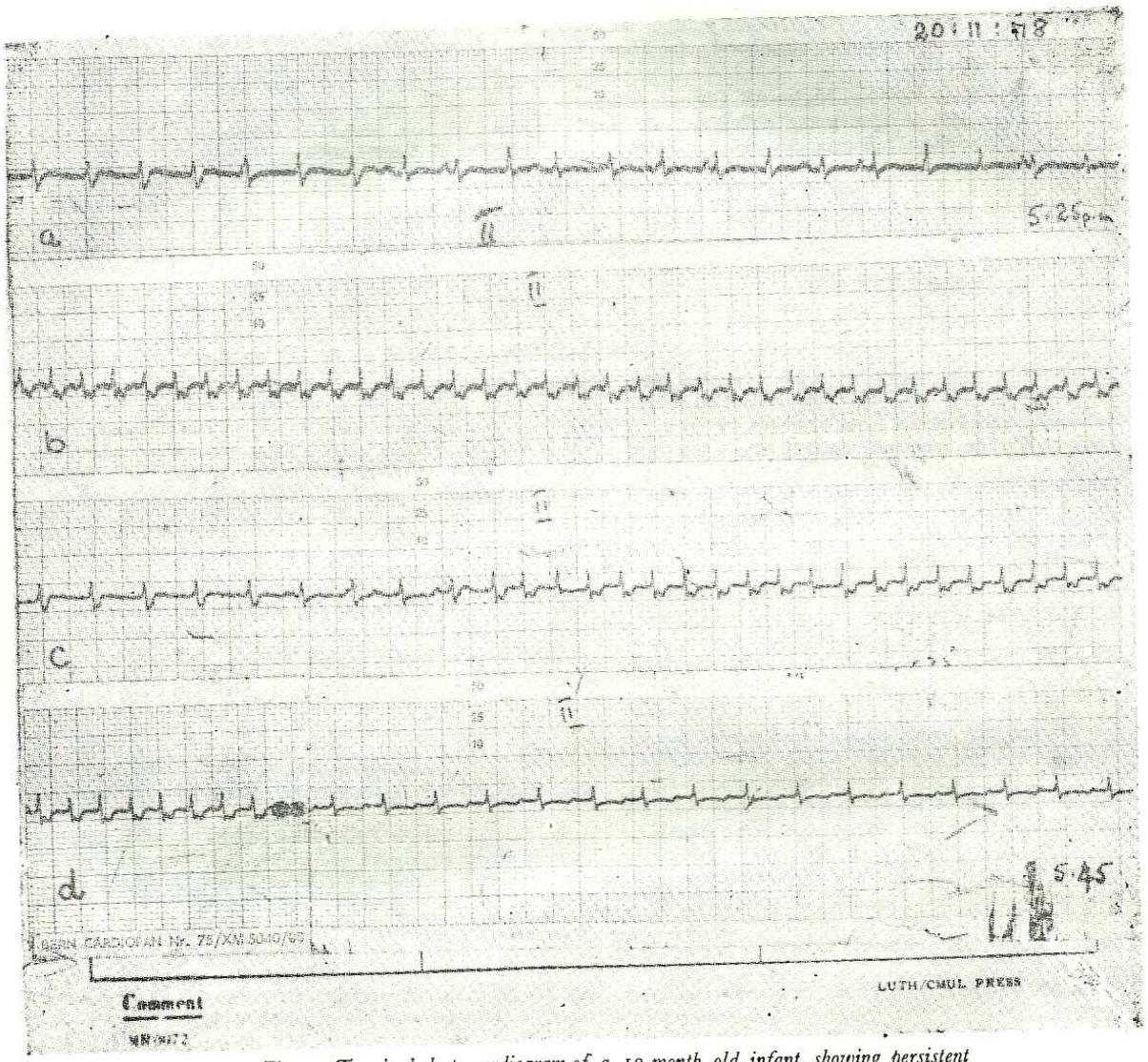

Fig. *Terminal electrocardiogram of a 13-month old infant, showing persistent supraventricular ectopic foci of excitation; atrial rate of 150 per minute in (a), and nodal rate of 300 per minute in (b).*

The present case illustrates chronic sustained supraventricular tachycardia in early childhood, associated with atrial septal defect, and causing death from acute cardiac failure. It also emphasizes the importance of noting inappropriate tachycardia and undertaking electrocardiographic studies promptly in such a situation.

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Accepted 26 August 1980