
CASE REPORT

Paroxysmal Supraventricular Tachycardia with Wolff-Parkinson-White Syndrome in a Neonate

by

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Abstract

A case of paroxysmal supraventricular tachycardia with Wolff-Parkinson-White syndrome in an Indonesian neonate born in the Departement of Obstetrics, Dr. Hasan Sadikin General Hospital, Bandung, is reported. Tachycardia in the neonate was first noted at the age of 6 days, but the heart rate gradually decreased in 8 hours after oxygen was administered. Electrocardiographic examination revealed a Wolff-Parkinson-White syndrome. A second attack of tachycardia occurred at the age of 2 months and the infant was immediately hospitalized and treated with lanoxin. Serial electrocardiographic examination still revealed the same syndrome. The management and prognosis of supraventricular tachycardia in the neonate is also discussed.

Introduction

Supraventricular tachycardia is a rapid, regular rhythm of sudden onset without any precipitating factor. The foci may be originating anywhere in the atrium, AV node or SA node (Moss and Adams, 1968; Walsh, 1968). Generally, during the paroxysm the heart rate is more than 180/minute and the atrial deflection in the electrocardiograms is indistinguishable. Estimate of incidence of supraventricular tachycardia is low, probably because of the absence of symptoms during undetected attacks that subside spontaneously (Walsh, 1968). However, Keith et al. (1967) have estimated that it occurs only once in every 25,000 children. The incidence of supraventricular tachycardia in the neonatal period is unknown (Schaffer and Avery, 1971). Nadas and Fyler (1972) have reported that of 41 cases, 14 were between the age of a few days until a few weeks and 25 were below the age of 4 months. Apley et al. (1955) reported that the age was between 6 to 30 days in 9 out of 13 cases.

Radford et al. (1976) reported 10 cases of congenital atrial tachycardia diagnosed in utero or at birth during an 18-year period; Wolff-Parkinson-White syndrome developed later in 2 cases. Supraventricular tachycardia has been associated with congenital heart disease, acute interstitial myocarditis, tumors of the heart, lesions of the central nervous system, and manipulation of the heart during cardiac surgery or cardiac catheterization

and drugs. However, in most cases the etiology is unknown (Schaffer and Avery, 1971; Walsh, 1968; Kaplan, 1975). Nadas and Fyler (1972) in their study on 41 cases reported that the Wolff-Parkinson-White syndrome was found in 10%, congenital heart disease in 20%, infection, trauma and tumors in 20% of the subjects, and in 50% the etiology was unknown (idiopathic).

The Wolff-Parkinson-White syndrome is often of congenital origin, but has been reported only in 5 cases during the first week of life; only one of them was asymptomatic (Walsh, 1968). The purpose of this study is to report a case of paroxysmal supraventricular tachycardia with a Wolff-Parkinson-White syndrome in a male neonate nursed in the neonatal ward, Department of Child Health, Dr. Hasan Sadikin General Hospital, Bandung.

Case report

The patient, T., is an Indonesian neonate born in the Department of Obstetrics, Dr. Hasan Sadikin General Hospital, Bandung. The delivery was uneventful with a birth weight of 2,950 grams and body length of 50 cm. Eight days prior to delivery the mother was hospitalized due to heart failure, mitral insufficiency, and stenosis with a hemoglobin concentration of 11.9 gm.% and blood pressure of 110/80. The therapy consisted of lanoxin and lasix. Tachycardia in the neonate was first noted

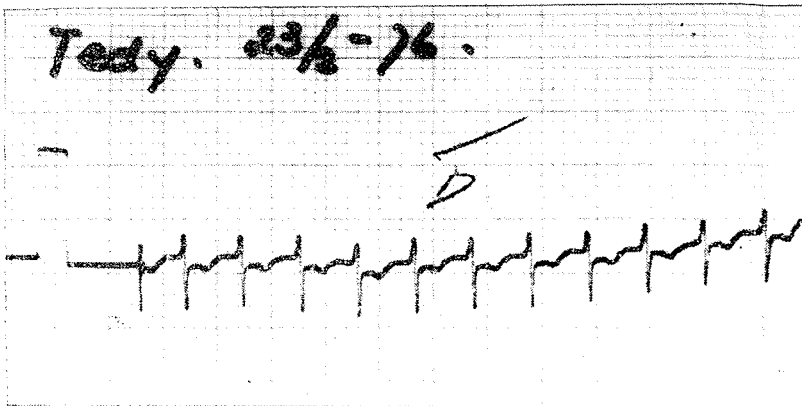


FIG. 1: *Supraventricular tachycardia in lead I at the age of 6 days*

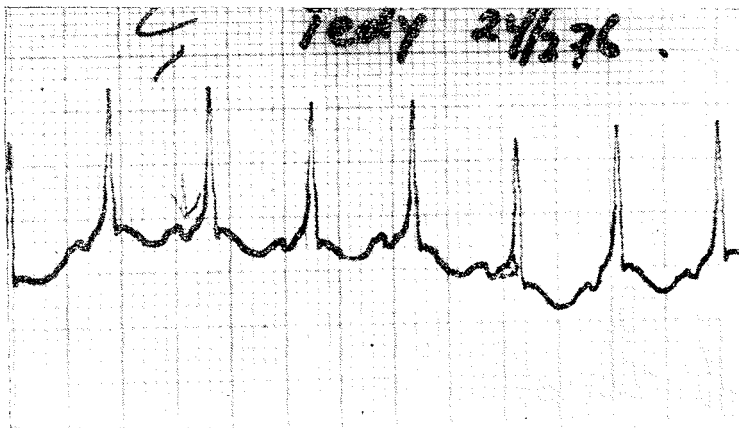


FIG 2: *Wolff-Parkinson-White Syndrome in lead VI at the age of 7 days*

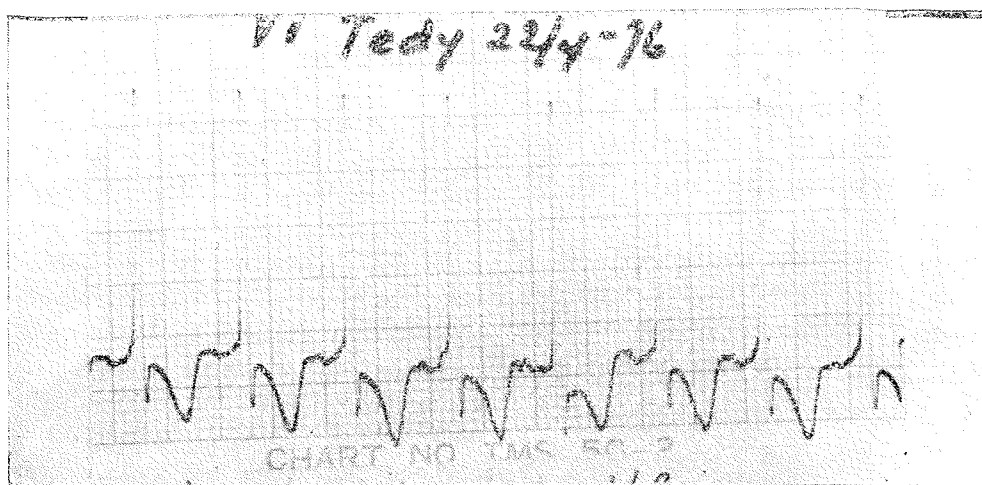


FIG 3: Wolff-Perkinson-White Syndrome in lead VI at the age of 5 months

during a routine examination at the age of 6 days. Except for a rapid heart rate no other particulars were found on physical examination. His hemoglobin concentration was 19 gm.% and leucocyte count 8,000/mm³. No cardiomegaly was observed on the chest roentgenograph. Electrocardiographic examination revealed a supraventricular tachycardia with a heart rate of 300/minute (Fig. 1).

Oxygen was soon administered to the patient and he was closely observed especially for early signs of congestive heart failure. With the above management the heart rate gradually decreased to 180/min. in 8 hours. Electrocardiographic examination on the following day revealed a Wolff-Parkinson-White syndrome with a heart rate of 150/min. (Fig. 2). On request of the parents, the neonate was discharged after 7 days

of hospitalization with a body weight of 3,200 grams.

At the age of one month, the body weight was 3,200 grams, hemoglobin concentration was 14.5 gm.%, and electrocardiograms showed a Wolff-Parkinson-White syndrome with a heart rate of 150/min. The infant was soon hospitalized after a second attack of tachycardia had been detected at the age of 2 months. On admission, the infant was irritable and dyspneic with a body weight of 4,600 grams. Except for a rapid heart rate no other particulars were found on physical examination. The hemoglobin concentration was 14 gm%, leucocyte count 9,300/mm³, and hematocrit 40%. Electrocardiographic examination showed a supraventricular tachycardia with a heart rate of 200/min.

The patient was treated with lanoxin and was given oxygen. On request of the parents he was discharged after 24 hours of hospitalization to be followed at the outpatient clinic. After the first follow up visit at the age of 3 months, the patient failed to return. Electrocardiographic examination made prior to discharge and on the first follow up visit revealed a Wolff-Parkinson-White syndrome with a heart rate of 150/min. (Fig. 3).

Discussion

Tachycardia in the neonatal period is a very serious condition, because the longer it persists the more likely congestive heart failure will develop. Before instituting treatment, it is very important to be certain that we are dealing with supraventricular tachycardia and not with ventricular tachycardia because the treatment and prognosis are different. The presence of supraventricular tachycardia in our case was confirmed by electrocardiographic findings. As a rule, the onset of tachycardia in a male infant less than 4 months of age is not associated with any underlying disease (Walsh, 1968). According to Nadas and Fyler (1972), supraventricular tachycardia can be divided into 2 groups: Group I consists of male infants less than 4 months of age, usually idiopathic, and Group II consists of older infants and children of either sexes who may or may not be associated with any underlying disease.

In our case no underlying disease was found and it was observed that Wolff-Parkinson-White syndrome persisted between attacks. This syndrome is probably due to anomalous connections between atrium and ventricle (Bundle of Kent) which have been described in normal fetal and neonatal hearts (Davies, 1971). It has been stated that 40% of patients with Wolff-Parkinson-White syndrome suffered from repeated attacks of tachycardia and ran a risk of sudden death. Others have claimed that the Wolff-Parkinson-White syndrome is seen in 0.1 — 0.3% of routine mass survey electrocardiogram and that it is less associated with morbidity and mortality (Davies, 1971).

It was reported that about 5% of patients with supraventricular tachycardia exhibited Wolff-Parkinson-White syndrome between attacks (Kaplan, 1975), while Nadas and Fyler (1972) reported the incidence in 10% of their cases. The development of congestive heart failure in supraventricular tachycardia is determined by the heart rate, the duration of paroxysms, and the age of the patients (Nadas and Fyler, 1972). Congestive heart failure occurs if the attack of supraventricular tachycardia has lasted at least 24 hours with a heart rate of at least 180/minute; the younger the patient the more likely will congestive heart failure develop (Rowe and Merizi, 1968; Walsh, 1968; Nadas and Fyler, 1972; Kelminson and Nora, 1972). Nadas and Fyler (1972) reported that 7 out of 41 cases of supraventricular ta-

chycardia were asymptomatic, and congestive heart failure was found in 50%.

The management of supraventricular tachycardia is directed to the control of the paroxysms and to prevent the development of congestive heart failure. Although vagal reflex stimulation prior to digitalization is often successful in older children, it is seldom effective in infancy and therefore preferably should not be used due to its potential hazards (Rowe and Merizi, 1968; Moss and Adams, 1968; Schaffer and Avery, 1971; Kaplan, 1975). The management of supraventricular tachycardia in the neonatal period consists of oxygen and morphine administration if necessary, intravenous fluid therapy using hypotonic solutions and digitalis given parenterally. Direct countershock is indicated if the above measures failed to control the paroxysms (Schaffer and Avery, 1971).

On the other hand, as congestive heart failure seldom occurs until the paroxysms has lasted for at least 24 hours, heroic measures are best avoided (Walsh, 1968; Keith et al., 1967). Patients with Wolff-Parkinson-White syndrome are usually more resistant to digitalis therapy (Walsh, 1968; Talner, 1971) and have more frequent recurrences of paroxysmal attacks (Nadas and Fyler, 1972). It is recommended that in supraventri-

cular tachycardia with a Wolff-Parkinson-White syndrome digitalis therapy should be maintained for a one-year period, and if 2 or 3 attacks occur the therapy should be continued for several years.

In our case, tachycardia was first noted at the age of 6 days without any sign of congestive heart failure. In accordance with the suggestion of Walsh (1968) and Keith et al. (1967), the patient was only treated with oxygen administration and was closely observed for early signs of congestive heart failure. A second attack occurred at the age of 2 months and digitalis in full therapeutic doses was given parenterally along with free flow oxygen. The response to the above treatment was fair and the patient was continued on maintenance dose of digitalis. According to several authors (Keith et al., 1976; Walsh, 1968; Nadas and Fyler, 1972), the mortality rate of supraventricular tachycardia varies from 2 — 9%. Understanding and cooperation of the parents are important in determining the prognosis of the patient; hence the prognosis of our case is difficult to be established because the patient failed to appear for follow up examinations, presumably due to lack of parental cooperation.

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