Neonatal frequent premature ventricular contraction

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DESCRIPTION

A female baby was born at term by emergency caesarean section, due to non-reassuring fetal status on the cardiotocography and chorioamnionitis. Her Apgar score was 8 (1 min)/9 (5 min), and no heart murmur or irregular beats were heard on physical examination soon after the birth. One hour after the birth, the nurse noticed that the patient's heartbeats were irregular during the routine examination.

The patient appeared normal without any abnormal physical findings other than irregular heartbeats. Her vital signs were all normal. Electronic cardiac monitoring revealed frequent monomorphic premature ventricular contractions (PVCs), frequently converted to bigeminy or trigeminy (figure 1). The patient's blood test and echocardiography results were normal. The 12-lead ECG detected frequent monomorphic PVCs (figure 2). Holter monitoring for 24 hours revealed no lethal ventricular tachycardias. PVCs accounted for 9.3% (675 beats/hour) of the entire heartbeats. In the second 24-hour continuous Holter monitoring performed on day 5, her PVC had decreased significantly to 1.9% (155 beats/hour). She was asymptomatic without any treatment and discharged from the neonatal intensive care unit on day 7 with her mother. We repeated 24-hour continuous Holter monitoring 1 month after birth, which revealed no PVCs.

Isolated PVCs are a common phenomenon observed in about 20% of healthy neonates.[1] However, frequent PVCs are quite rare in neonates. Because of the intrinsically higher heart rates in neonates, the threshold for 'frequent' PVCs in neonates has been set at more than 60 beats/hour, compared with more than 30 beats/hour in adults.[1] Exclusion of underlying conditions is important in evaluating frequent neonatal PVCs, including congenital heart disease, inflammatory myocardial disease, metabolic disease, electrolyte disorders or long QT syndrome.[2] If neonates are otherwise healthy, a simple blood test with ECG and echocardiography would be sufficient for this purpose, as metabolic disorders presenting with cardiac symptoms in neonates usually present with heart failure rather than isolated arrhythmia.[3]

Even in the absence of underlying disease, frequent PVCs may rarely develop in otherwise healthy neonates.[1] In these cases, PVCs usually resolve within a few months of birth,[1] which is much earlier than in adolescent patients.[4] This rapid resolution may be explained by the pathogenesis of frequent neonatal PVCs, which is thought to be due to immature cardiac conduction tissue and autonomic nervous system.[5]

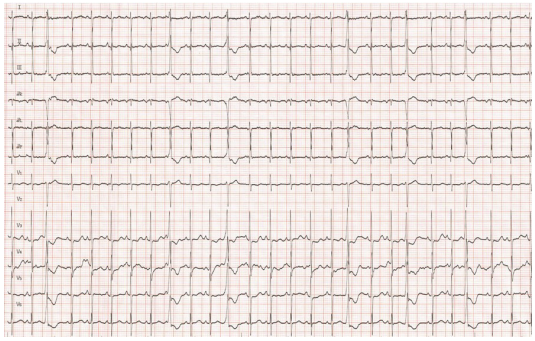

Figure 2 The 12-lead ECG detected frequent monomorphic premature ventricular contractions.

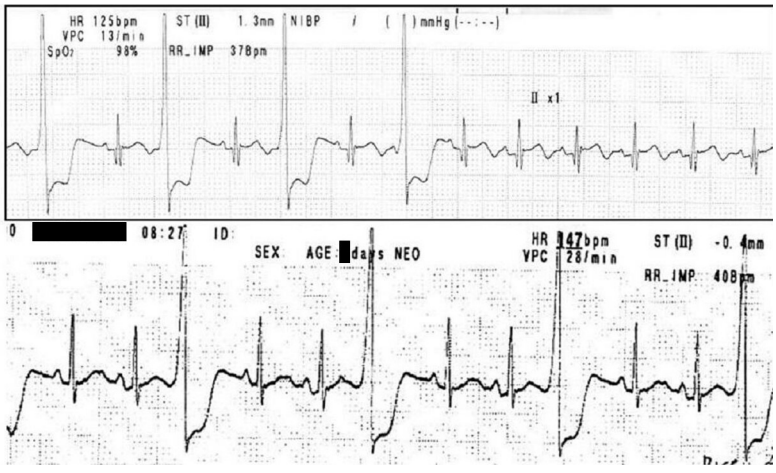

Figure 1 Electronic cardiac monitoring revealed frequent bigeminy or trigeminy.

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Learning points

- Neonatal frequent premature ventricular contractions (PVCs) are defined as PVCs over 60 beats/hour. The underlying cardiac or systemic illnesses should be evaluated.
- If there were no underlying illnesses, neonatal frequent PVCs would follow a self-limiting course, which usually resolves spontaneously within a few months of birth.

Antiarrhythmic medication would not be needed unless other types of arrhythmia developed during follow-up.

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Case reports provide a valuable learning resource for the scientific community and can indicate areas of interest for future research. They should not be used in isolation to guide treatment choices or public health policy.

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