

Pathognomonic ECG in Neonates with Enterovirus Myocarditis

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Objective: To assess whether there is a distinctive ECG pattern in neonates who developed enterovirus (EV) myocarditis within the first weeks of life.

Design: Electrocardiogram (ECG) findings, clinical presentation, echocardiography data, and the outcome of infants with EV myocarditis were retrospectively analysed and compared with the literature.

Results: From 1994 to 2009 eight neonates presented with cardiac failure within 17 days after birth requiring respiratory and circulatory support. Coxsackie virus B could be detected as the source of the myocarditis in all. Two infants died 10 and 39 days after diagnosis. ECG performed at admittance showed a complete loss of the R-wave and a deep Q wave in I,II and the left precordial leads (black arrows in figure) in all patients. These ECG changes resolved within months in the survivors. Echocardiography showed left ventricular dilatation, severe systolic dysfunction and hyperechogenic non contractile areas in all; analogous to myocardial infarction in adults. In all survivors aneurysm formation in the left ventricular wall was found weeks to months later. The survivors developed long-term cardiac sequelae requiring medication. Only one similar ECG in a neonate with EV myocarditis was published in the literature without comparing it with the whole cohort (Inwald D et al, Arch Dis Child Fetal Neonatal Ed. 2004;89:F461-2)

Conclusion: Complete loss of R-wave and pathologic Q waves seem almost pathognomonic for EV myocarditis in neonates which predominantly affects the left ventricle. This ECG pattern is not known as typical ECG pattern in acute myocarditis. It is comparable with ECG after myocardial infarction, but unlike patients with myocardial infarction this ECG pattern returns to normal in surviving patients. This phenomenon is not described earlier in the literature. ECG should be used as a simple diagnostic tool after admittance of a neonate with the history of suspected neonatal myocarditis. It does not replace virus diagnostic or echocardiography, but confirms and completes its diagnosis.