Cardiomyopathy in Infants of Diabetic Mothers

To the Editor:

The interesting echocardiographic data recently reported by Gutgesell et al.¹ were most informative. However, several important correlations appear to have been overlooked by the authors. The authors failed to find a relationship between "electrocardiographic evidence of ventricular hypertrophy and echocardiographic findings." The data were reevaluated by assigning a score of one to each echo measurement falling greater than 2 standard deviations from the mean for their normal control values (e.g., RWA > 5, RV > 11, IVS > 5, LVPW > 1.5, EDD > 18, % Δ > 40, LVOT > 5, TCD > 36). The sum was totaled for each infant, and a nonparametric Mann-Whitney U test applied to evaluate the distribution difference between the groups with normal and abnormal ECGs. The total number of abnormal values correlates in a bimodal distribution with an abnormal ECG (p < 0.0001, fig. 1). Therefore, infants with ECG abnormalities are more likely to have associated multiple echocardiographic abnormalities.

The statement that "... LV systolic function is normal by echocardiography"² is not supported by the authors' data. Using their normal criteria for "percent change in left ventricular diameter (Δ LVD)" three of the 24 symptomatic infants have values greater than 2 standard deviations from the mean. Three (12%) are hypodynamic, perhaps indicating congestive heart failure. But notably, six (25%) have increased ventricular contractility. The increased contractility might relate to the increased adrenergic tone secondary to hypoglycemia, to inotropic agents already being administered, or may relate directly to the apparent cardiomyopathy. The observation of increased contractility in some infants appears to reinforce the authors' caution regarding the indiscriminate use of inotropic agents of digitalis in symptomatic infants of diabetic mothers.

WILL H. DRUMMOND, M.D.
Department of Pediatrics
University of Florida
School of Medicine
Gainesville, Florida

Reference


The author replies:

To the Editor:

Dr. Drummond has raised several pertinent issues regarding our study of cardiomyopathy in infants of diabetic mothers (IDMs).¹ The first regards the usefulness and specificity of the ECGs. We stated that "in general . . . there was no consistent relationship between the electrocardiographic evidence of ventricular hypertrophy and the echocardiographic finding." We believe that the data support this conclusion. For example, Patients 6, 17 and 20 (table 2) had right ventricular hypertrophy (RVH) by ECG, but normal right ventricular wall thickness and cavity diameter by echo. Patient 18 had biventricular hypertrophy on ECG, but normal right and left ventricular cavity diameters and normal thickness of the right and left ventricular walls and septum. Thus, although an abnormal ECG may be predictive of echocardiographic abnormalities in general, it does not appear to be very specific in predicting the nature of these abnormalities.

The second question raised by Dr. Drummond is whether systolic function is in fact normal in IDMs. The mean percent change in left ventricular diameter (Δ LVD) of the symptomatic IDM (36.1 ± 8.3%) was not statistically different than that of the normal newborns (33.6 ± 3.4%), although the range was greater, and indeed,
Cardiomyopathy in infants of diabetic mothers.
W H Drummond

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