133 PROGNOSTIC VALUE OF EXERCISE STRESS TESTING IN HYPERTENSIVE ADOLESCENTS

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The purpose of this study was to determine if blood pressures (BP) during dynamic exercise (DYN EX) and isometric exercise (ISO EX) in hypertensive adolescents are useful in identifying those destined to have persistent blood pressure elevations. All 62 subjects had pressures above the 95th percentile on three 8th grade exams. Dynamic and isometric stress tests were performed in the 9th grade and resting BP was remeasured on 3 exams in the 10th grade. Students were classified on the basis of their 10th grade BP: I. Normal BP II. Elevated BP on 1 or 2 exams, III. Persistent BP elevations in all 3 exams:

10th Grade BP	No.	Resting BP	DYN EX BP	ISO EX BP
I Normal	23	137±8/67±9	185±23/50±30	147±15/84±22
II Inconstant†	20	135±11/68±10	182±25/65±33	144±12/89±10
III Persistent†	19	145±10/66±12	196±20/65±35	145±10/93±11

Stepwise regression was used to correlate the BP at rest and during exercise with 10th grade resting BP. Systolic BP during DYN EX and diastolic BP during ISO EX had significant correlations with 10th grade BP, $p<.007$ and $p<.05$ respectively. However, comparing exercise pressures with resting pressures, the former accounted for only an additional 5% of the variance of the 10th grade pressures. Therefore, if hypertension is suspected on the basis of three resting pressures doing exercise testing adds little to the accuracy of predicting blood pressure status one year later.

134 FAILURE OF M-MODE ECHOCARDIOGRAM TO DETERMINE CONGENITAL AORTIC VALVE BICUSPIDIZATION. ANATOMIC CORRELATION BY ORIFICE-VIEW AORTOGRAPHY.

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M-mode echocardiography is currently an accepted method for the detection of the congenitally bicuspid aortic valve. Utilizing an angiographic method of en face viewing of the aortic valve a precise evaluation of the anatomic configuration of the aortic valve has been shown by us to be possible. Employing this technique of orifice-view aortography two distinct aortic valve deformities have been identified when the aortic valve is bicuspid: (1)inequality of cusp size and (2) near-equality of cusp size as determined by planimetry of the valve during motion picture projection. We have studied a group of 10 young patients with a congenital equally bicuspid aortic valve. When these patients were subjected to M-mode echocardiography, 3 revealed features of a normal aortic valve with no eccentricity of the line of closure within the echographic boundaries of the aortic lumen and absence of multiple echos; in an additional patient the findings were equivocal failing to allow definitive diagnosis. From this correlative evaluation we conclude that M-mode echocardiography alone is not a reliable indicator of aortic valve bicuspidization when there is near-equality of the cusp size. This finding has clinical implications relating to those laboratories employing only M-mode echocardiography for routine cardiovascular evaluation.

135 MYOCARDIAL FUNCTION OF THE NEWBORN WITH CONGENITAL HYPOTHYROIDISM.

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Because of the known differences between newborn and adult myocardial tissue, this study was undertaken to evaluate by echocardiography the cardiovascular condition of 13 hypothyroid infants (HI), aged 3 to 9 weeks. Left ventricular (LV) systolic and diastolic dimensions, posterior wall thickness, end diastolic (EDV) and systolic volumes were all significanlty lower in the HI, compared to 23 normal infants of the same age ($p < 0.05$). No pericardial effusion was found. All HI had a significant bradycardia ($p < 0.01$) with a low cardiac output ($p < 0.02$). The mean velocity of circumferencial fiber shortening and the shortening fraction of LV were normal. However the pre-ejection period (PEP) was abnormally prolonged ($p < 0.05$) as well as the ratio PEP to left ventricular ejection time (LVET) ($p < 0.01$). PEP/LVET correlated inversely with EDV, suggesting that the elevated PEP/ET could partly be due to the decreased pre-load. In conclusion, the cardiovascular involvement in congenital neonatal hypothyroidism is characterized by a low cardiac output with a normal myocardial function and absence of pericardial effusion. This study confirms the concept that in hypothyriodism the cardiomegaly is essentially due to pericardial effusion.

136 GLUCOSE AND INSULIN CHANGES DURING HEART SURGERY.

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We have noted marked hyperglycemia(HG) in patients(PTS) undergoing heart surgery(HS). To evaluate the mechanisms for HG paired blood samples were evaluated for glucose(G) and insulin(I) levels in PTS <2 years with hypothermia(HT) and total circulatory arrest (TCA) (Group 1), <2 years with HT and and no TCA (Group 2) and >2 years with HT and no TCA (Group 3). G input was also monitored.

Group	1 (n=10) mean		2 (n=13) mean		3 (n=10) mean	
	G mg %	IμU/ml	G mg %	IμU/ml	G mg %	IμU/ml
Control	226	8.9	186	11.3	203	9.9
Re-start	324	8.7	272	6.5	279	6.1
End Rewarm	343	20.3	279	21.2	271	26.5
1 Hr. Post-op	325	7.7	308	12.0	294	14.5
2 Hr. Post-op	290	11.0	302	19.4	296	15.5
3 Hr. Post-op	310	15.9	267	16.4	267	15.0
24 Hr. Post-op	120	9.3	121	11.3	137	22.2
Glucose Input						
Intra-op	11.1 mg/kg/min		6.8 mg/kg/min		5.6 mg/kg/min	
Post-op	3.4 mg/kg/min		3.9 mg/kg/min		3.1 mg/kg/min	

We conclude: (1) Intraoperative infusion of G plays a significant role in HG (2) HT results in significant changes in I (3) PTS >2 years have higher I levels than PTS <2 years in spite of lower G input. We recommend restricted G input in the intraoperative period to prevent HG during HS.

137 EXTENDED USE OF PROSTAGLANDIN E_1 (PgE_1) IN NEONATES

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Thirty infants with suspected ductus-dependent cardiac defects (DCD) were treated with PgE_1. A positive response was: improvement in oxygenation, acid-base balance and/or peripheral perfusion. Responsders/number of patients per defect were: severe Tetralogy 4/5, pulmonary atresia 9/9, coarctation 4/4, transposition 3/5, severe aortic stenosis 1/1, hypoplastic aortic or mitral valve 5/5, and myocarditis 1/1. Age at initiation of therapy ranged from 1-22 days (4 ± 6, mean ± S.D.); the oldest patients responded at ages 16, 17, and 22 days. Minimal effective intravenous dose was 2-100 ng/kg/min (35 ± 31) and 9 patients required ≤10 ng/kg/min. After PgE_1 was started, improvement was prompt and readily maintained. The end-point of administration was cardiac surgery in 21 patients, 1-120 days (24 ± 37) after initiation of PgE_1; in 2 of these, because of inadequate shunts PgE_1 was restarted until the shunts were revised. Two responders and one non-responder were weaned without surgery, and 7 died of causes unrelated to PgE_1. Minor side effects were seen in 3/30 infants: apnea (1), fever of 102°F (1), and mild hypotension (1). In summary, PgE_1 is very useful in infants with a variety of DCD. Babies older than 2 weeks at initial therapy may respond, and continue to respond, up to 4 months of age, PgE_1 is effective in low doses, and prolonged intravenous administration is associated with few apparent side effects.

138 PROSPECTIVE ANALYSIS OF PATENT DUCTUS ARTERIOSUS (PDA) IN INBORN INFANTS < 1500 GM.

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Despite an increasing practice of ductal closure in the first 72h, neither the incidence of symptomatic PDA (sPDA) nor need for such aggressive therapy is clear. We have determined the incidence and onset of sPDA and related echocardiographic (ECHO) and clinical findings in a prospective study (6/1/79 to 4/30/80) of all inborn infants ≤ 1500g BW surviving > 72h. The same physician examined all infants q 48h; sPDA was defined by criteria of Cotton,et.al. ECHOs at 7d were read blindly. sPDA occurred in 4/120 infants (3%) in the 1st week and only 19 infants total (16%), mean onset (± SD)=15 ± 3d. Ligation was required in 9 infants, 2 at <1 wk. sPDA group differed ($p<.05$) from others in mean BW (1034 vs 1188g), EGA (29 vs 31 wks), and early volume expanders (53 vs 22%) and vent. therapy (63 vs 37%), but not in fluid intake, Apgar, HMD, or NEC. On ECHO, LA/Ao, LVD/BW, and LA/BW were greater ($p<.001$) in infants later developing sPDA (1.43 ± 0.33, 13.7 ± 3.3, 8.26 ± 2.46) than those without sPDA (1.17 ± 0.25, 11.1 ± 2.1, 6.13 ± 1.31); however, the predictive value was limited, e.g., sensitivity of LA/Ao > 1.15 was 80% and specificity 50%, while LVD/BW > 12 was 67 and 75% and LA/BW > 6.0 was 73 and 49%, respectively. Values lower than these were ≥89% predictive for no sPDA after 7d. sPDA is not necessarily a common or early problem in infants <1500g. Although silent PDAs may alter the ECHO, indications and benefits of early closure remain to be determined by randomized studies.