932-96 Blood Pressure Response to Exercise in the Evaluation of Hypertension in Childhood

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BP response to exercise is exaggerated in pts with hypertension(HTN). Ambulatory BP monitoring(AMB) has been used to separate pts with "white coat" HTN from those with true elevation of BP, a role potentially accomplished by measuring BP response to treadmill (TE). To evaluate this, we studied 30 consecutive children referred for HTN by AMB and TE. *Method:* (1)*Office BP:* Average of 3 by Dynamapp; HTN = SBP ± DBP > 95th %ile (2nd Task Force normals for age/wt/sex). (2)*AMB:* Suntech monitor; HTN = average wake SBP ± DBP > 95th %ile, 2nd Task Force; and/or > 1SD above mean for AMB reported normals. (3)*TE:* Modified Bruce protocol; BP at rest, immediately post exercise (< 30 secs) and Q 2 mins in recovery. HTN = Maximum post exercise SBP < 1SD above max BP in reported normals for surface area. *Results:* Age range was 7 to 16 years (mean = 12.4 yrs) with 20 males and 10 females. On office BP, SBP in 30/30 and DBP in 5/30 was > 95 %ile for age/wt/sex. AMB diagnosed HTN in 13 of 30 pts including all 5 with DBP elevation. With TE, all pts achieved ≥ 85% of predicted maximum HR with normal maximum VO_2 for weight and Rmax > 1.0. BP response to exercise was abnormal in all 13 pts diagnosed with HTN on AMB (sensitivity = 100%) with maximum post-exercise systolic BP of 209 mmHg ± 20 (mean ± 1SD) compared with 175 mmHg ± 23 for those with negative AMB($P < 0.05$). Of the 17 pts with no HTN on AMB, two had HTN on TE (specificity = 89%). In 4 pts who required pharmacologic treatment, follow-up TE results paralleled AMB findings in all. *Conclusion:* (1) BP response to TE is useful in the evaluation and management of pediatric HTN. (2) Study findings confirm importance of additional tests before making the diagnosis of HTN in childhood.

932-97 Exercise Induced Left Axis Deviation Is a Highly Specific Marker of Left Anterior Descending Coronary Artery Disease

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In a previous retrospective study of patients (pts) with single vessel coronary artery disease we showed that exercise induced QRS left axis deviation may be a useful marker of left anterior descending (LAD) coronary disease. To verify this finding we studied prospectively the mean frontal QRS axis at rest and at peak exercise in 66 consecutive patients with chest pain who were referred for diagnostic coronary angiography on the basis of a positive exercise test. Exercise-induced left axis QRS deviation (change in axis ≥ 10°) was correlated with LAD stenosis (≥ 70% worst view narrowing) in the present prospective study and after grouping the present prospective and previous retrospective studies:

Left QRS axis shift	Sensitivity	Specificity	p value
Prospective data	9/40 (23%)	26/26 (100%)	0.025
Combined prospective and retrospective data	25/85 (29%)	80/80 (100%)	<0.0001

These findings were true irrespective of the presence of single or multivessel coronary disease. In 7/9 pts the lesion was proximal to the first major septal perforator, and in 2 patients immediately distal to it. In 5 pts who had a repeat exercise test after LAD revascularization the exercise induced left axis deviation disappeared.

Conclusion: Exercise induced QRS left axis deviation is a highly specific marker of proximal LAD coronary artery disease.

932-98 Dobutamine-Induced ST Changes: Relationship to the Presence and Extent of Myocardial Ischemia

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This study sought to determine the relationship between ST segment changes during dobutamine stress echocardiography (DSE) and the echocardiographically-defined ischemic burn. Accordingly, we studied 115 consecutive patients (pts) (excluding pts with left bundle branch block or on digoxin; mean age 66 ± 11) referred for DSE for the evaluation of known or suspected coronary artery disease. *Methods:* Stress electrocardiograms were blindly interpreted, with ≥ 0.5 mm of stress-induced ST depression (STD) considered significant. Regional (anterior and inferoposterior) and mean global wall motion scores (WMS) were assigned. *Results:* The presence of any stress-induced ST segment change was associated with greater changes in global WMS (0.18 ± 0.04 vs. 0.09 ± 0.03, p = 0.04) and regional WMS for the worst region (0.33 ± 0.06 vs. 0.14 ± 0.04; p = 0.06). However, the depth of STD showed a poor linear correlation with the change in mean global (r = 0.23; p = NS) and regional WMS (r = 0.18; p = NS). When stratified according to the degree of STD, pts with mild STD (0.5 to < 1 mm; n = 13) had similar changes in mean global and regional wall motion scores compared to pts with ≥ 1 mm of STD (n = 32). Dobutamine dose, atropine use and double product were comparable in these two groups. Positive predictive values for the diagnostic criteria ≥ 0.5 mm and ≥ 1 mm of STD were comparable (63% and 65%, respectively). *Conclusions:* The presence of STD during DSE is associated with echocardiographically-defined ischemia; however, the severity of STD correlates poorly with the ischemic burden. STD during DSE can be mild, yet still reflect significant inducible ischemia.

932-99 Best Detection of Coronary Artery Disease and Identification of the Significantly Narrowed Coronary Artery(ies), Using a New Technique in Exercise Testing

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It is known that right precordial leads RV_3, RV_4, RV_5 could detect Right coronary (RC) artery stenosis. The common exercise test (ET) has a low ability to detect RC disease especially as a single vessel disease (VD). The aim of this study was to improve the diagnostic accuracy of the ET for the detection of coronary artery disease (CAD) using a combination of Left (L) and Right (R) precordial leads. We studied 245 patients (pts) aged 32–74 (mean 52 ± 8) years (218 males and 27 females) who underwent treadmill ET using the Bruce protocol and coronary arteriography. We used two Exercise systems. The pts were walking on the treadmill of the one system. In the monitor of the first system the usual 12-lead ECG and in the monitor of the second system the additional R precordial leads (RV_3, RV_4, RV_5) were simultaneously recording. Thirty-four pts had normal coronary arteries, whereas 85 pts had 1-VD, 84 2-VD and 42 3-VD. Of the pts with 1-VD, 35 had Left Anterior Descending (LAD) disease, 28 had RC artery disease and 22 Left Circumflex (LC) artery disease. The sensitivities of the usual 12-lead ET and of the new technique for the detection of LAD disease were found respectively 77% (27/35) vs 91% (32/35), for RC disease 25% (7/28) vs 89% (25/28), for LC disease 45% (10/22) vs 86% (19/22), for the detection of 1-VD were 52% (44/85) vs 89% (76/85), for 2-VD 71% (60/84) vs 96% (81/84), for 3-VD 83% (35/42) vs 100% (42/42) and for the detection of CAD 66% (139/211) vs 94% (199/211), p < 0.001, while the specificities were found the same 91% (31/34).

This new technique has the best diagnostic ability for the detection of CAD and may identify the significantly narrowed coronary artery(ies).

932-100 Is Exercise Treadmill Testing Post Stent Implantation Safe?

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Since the publication of the STRESS and BENESTENT trials, the implantation of coronary stents as a treatment for CAD has proliferated. Anecdotal but unpublished reports of acute stent thrombosis occurring soon after exercise testing (ETT) have been presented but no published data regarding the safety of ETT in this group of pts exists. To evaluate this question 105 consecutive pts who had intracoronary stents at OSUMC between 8/31/84 and 8/4/95 were evaluated. 21 pts had undergone ETT; 9 of these pts had Cook stents and 12 pts had J and J stents. Maximum exertion, defined as max HR > 85% of max predicted or an RER > 1.0 on metabolic testing, was achieved in 12 pts. The remaining 9 pts did not achieve 85% of their maximum heart rate, with 6 being treated with B-blockers. None of the pts developed stent thrombosis during or after ETT including 8 pts exercised less than 35 days after implantation. One pt had a positive exercise Thallium 101 days after implantation and was found on catheterization to have an occluded stent. Another pt developed exertional angina and infarcted 91 days after the stent was placed. The time from implantation to ETT varied between 2 and 119 days, with the mean time being 55 days (7.9 weeks).

In conclusion, no episodes of acute stent thrombosis with maximum ETT after stent implantation were observed. This is an important finding since maximal ETT is useful for both diagnostic purposes as well as developing exercise prescriptions for Cardiac Rehabilitation.