WGCH—Abstracts for Oral Presentations

221 URINARY PROSTAGLANDIN (PG) EXCRETION IN PRIMARY AND SECONDARY HYPERTENSION.

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Hypertension may be due to volume overload, the pressor effect of circulating agents such as renin or, theoretically, to reduced levels of circulating vasodilator agents. Certain prostaglandins, e.g. PGE_2 are known vasodilators. The renal medulla is known to be a source of PGE_2, kidney damage could therefore result in reduced production and hence contribute to the development of hypertension. Experimental work suggests that there is decreased production of PGE_2 in areas of induced renal scarring. We have previously established a normal range for the 24 hour urinary excretion of PGE_2, $PGF_{2\alpha}$, 6 keto $PGF_{1\alpha}$ and thromboxane B_2 (TXB_2) and have shown that relating the values obtained to urinary creatinine (Cr) is the most useful index of PG excretion. We therefore studied a group of children with secondary hypertension (due to reflux nephropathy or renovascular disease) and compared them with normal children and with children with primary hypertension. 24 hour urine collections were obtained from hypertensive children at diagnosis, and random urine specimens collected at follow-up clinic visits. No differences were found between hypertensives and normals in the PG:Cr ratios for $PGF_{2\alpha}$, 6 keto $PGF_{1\alpha}$ and TXB_2. However, PGE_2:Cr ratios were substantially reduced in children with secondary hypertension when compared with normal (7.7 vs 17.5 ng/mmol Cr). Children with essential hypertension had PGE_2:Cr ratios at the lower end of the normal range. Our data demonstrate reduced PGE_2 excretion in secondary hypertension, which may be a contributory factor in its development.

222 INCREASED PLASMA DOPAMINE, NORADRENALINE, AND ADRENALINE CONCENTRATIONS IN YOUNG HYPERTENSIVE SUBJECTS.

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Plasma dopamine, noradrenaline, adrenaline and renin-activity were measured in 39 subjects with stable mild hypertension (mean age 23.9 years, 34 males), and in 39 age-matched normotensive controls from the same open population. Mean sitting blood pressure in hypertensives was 142/82 mmHg. In normotensives average blood pressure was 125/74 mmHg. Plasma catecholamines were measured with a COMT radioenzymatic assay.

Plasma dopamine was significantly higher in hypertensives (72 ± SE 7 pg/ml) than in normotensives (46 ± SE 4 pg/ml; $p<0.01$). The same was true for noradrenaline (302 ± SE 23 pg/ml in hypertensives, and 157 ± SE 9 pg/ml in normotensives; $p<0.001$), and for adrenaline (91 ± SE 13 pg/ml in hypertensives and 38 ± SE 4 pg/ml in normotensives; $p<0.001$). There were no significant differences in pulse rate between hypertensives (71 beats/min) and normotensives (72 beats/min). Also, 24 hr urinary sodium and potassium excretion was not different between the groups.

In normotensives a positive relation between plasma noradrenaline and systolic blood pressure, and a negative one between plasma dopamine and systolic blood pressure was observed. In hypertensives no significant association between noradrenaline, dopamine and systolic blood pressure was found.

These findings provide evidence for the hypothesis that excessive sympathetic outflow plays a role in the early pathogenesis of hypertension. They also indicate that dopaminergic activity may be implicated in early hypertension.

223 ESSENTIAL HYPERTENSION IN CHILDHOOD: A DISORDER OF ERYTHROCYTE SODIUM TRANSPORT?

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Erythrocyte intracellular sodium concentration (IcNa, mmol/l) Na^{22} efflux rate constant (NaERC) and H^3 ouabain binding to receptor sites on the Na-K pump (Bmax, nmol/l cells) were measured in normal children (n=15), children with primary hypertension (n=11) and children with secondary hypertension (n=18). The development of minaturised methods allows all the measurements to be undertaken using only 6 ml of blood, instead of the 30-50 ml reported previously. In children with primary hypertension IcNa was found to be significantly higher (8.2 vs 6.6+6.7) and NaERC (0.5071 vs 0.6983+0.6197) and Bmax (9.1 vs 11.7+11.0) significantly lower than in normal children or in children with secondary hypertension. This suggests that investigation of erythrocyte sodium transport by measuring IcNa, NaERC and Bmax may aid in positively identifying children with primary as opposed to secondary hypertension. In addition these measurements may identify normotensive children at risk of developing hypertension in adult life. Further work is needed to decide whether these findings are a cause or consequence of hypertension or just a marker.

224 HYPERTENSION IN EXPERIMENTAL CHRONIC RENAL FAILURE (CRF): EFFECT OF DIETARY TAURINE.

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Taurine (tau) is the most abundant amino acid in the heart, where it is involved in the regulation of calcium homeostasis. It has antiarrhythmic and inotropic properties and is known to reduce blood pressure. In order to investigate a possible role of tau in the pathogenesis of hypertension in CRF, young 5/6 nephrectomized (NX) rats (body wt. 60 ± 5g) were fed with either a tau deficient (tau-) or a tau supplemented (tau +, 0,44 %) diet with low methionine (0,11 %) and cystine (0,10 %) content. Systolic BP and heart rate (HR) were measured weekly, heart weight and heart tau content 3 weeks after NX. BP increased in all animals according to growth, but hypertension developed only the tau-rats with CRF (BP: 160 ± vs. 140 ± 12 mm Hg; $p < 0,01$). Hypertrophy of heart was present in CRF animals of both feeding groups. This was not due to fluid accumulation, since heart water content was similar in all rats (77 ± 0,4). Heart tau concentration was reduced in all tau-rats (17,7 vs. 24,3 µmoles/gm wet wt.: $p < 0,02$). An increased tau content of the whole heart was found in the tau + animals with CRF.

In conclusion, the development of hypertension in CRF seems to be aggravated by dietary tau deficiency. Taurine supplementation may be useful in patients with CRF kept on low protein diets.

225 TREATMENT OF ACUTE RISE OF BLOOD PRESSURE IN INFANTS AND CHILDREN WITH NIFEDIPINE

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Eleven children aged 0.1 to 17 years (median 10 years) were treated with sublingual application of the calcium entry blocker nifedipine. Dose ranged between 0.22 to 0.76 mg/kg (mean 0.38 mg/kg). Nine children had renal hypertension, one pheochromocytoma and one aortic coarctation. Eight children were under chronic antihypertensive treatment. One hour following application of nifedipine systolic blood pressure fell significantly from 162±19 to 125±11 mmHg ($\bar{x}$ ± SD) and diastolic from 122±13 to 88±16 mmHg in 8 children with renal hypertension (aged 4 to 17 years). Blood pressure remained at this level for about 6 hours. Heart rate rose from 93±17 to 106±24 beats per min. 1 hour after nifedipine and returned to 96±15 4 hours after drug administration. Whereas plasma renin activity, plasma aldosterone and plasma arginine-vasopressin did not change in response to nifedipine, plasma noradrenaline rose significantly from 467±285 to 595±269pg/ml. In two infants (5 weeks and 7,5 months of age) systolic blood pressure fell by 40 and 50 mmHg, respectively. One child with pheochromocytoma had an excellent blood pressure response to nifedipine, however, the effect lasted only 4 hours. Nifedipine given sublingually was well tolerated also in infants and appears to be an effective and safe drug in the treatment of acute elevations of blood pressure.

226 NEONATAL OUTCOME IN TWO DIFFERENT TRIALS OF ANTIHYPERTENSIVE TREATMENT IN PREGNANCY.

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Severe hypertension in pregnancy (resting diastolic blood pressure ≥110 mmHg & proteinuria) is a threat to the wellbeing of the mother and her newborn infant. However, very few studies have assessed the value of antihypertensive drugs on the fetal outcome. We report data from 65 infants born to hypertensive mothers treated with clonidine and diuretics (group 1) and from 97 babies born to mothers treated with captopril and labetalol (group 2). The findings of group 1 were compared to those of group 2 and both were then compared to those obtained from gestational age-matched infants born to normotensive mothers (group 3 n.162). The results are presented in the following table:

PARAMETER	GROUP 1	GROUP 2	GROUP 3
Gestational age (wks)	36.2 ± 3.1	36.1 ± 3.4	36.2 ± 3.5
Birth weight (g)	2570 ± 866	2534 ± 979	2635 ± 855
Apgar score 1 min	6.6 ± 0.7	6.7 ± 0.8	7.8 ± 1.8*
Apgar score 5 min	7.7 ± 2.3	7.9 ± 2.1	9.0 ± 1.6*
% of cesarian section	65.3	69.1	34.0 *
% of S.G.A.	34.3	37.4	9.1 *
% of admission to N.I.C.U.	42.1	39.2	24.2 *
% of respiratory problems	19.1	17.5	8.3 *
% of neonatal deaths	14.2	12.3	4.6 *

(*) Value significantly different from values of groups 1 and 2 ($p\ 0.05 > < 0.01$)

This study confirms that severe hypertension in a pregnant woman is a disease shared even by her fetus. Furthermore, we have shown that even the use of very recent drugs, such as captopril and labetalol, do not result in any advantage for the neonatal outcome.