## 169 CHEMICAL CHARACTERIZATION OF RENAL BASEMENT MEMBRANES FROM MEN OF DIFFERENT AGES.

Glomeruli and tubules were isolated with a graded sieving procedure from the same renal cortex of men of premature age up to 80 years. Glomerular and tubular basement membranes (GBM and TBM, respectively) were obtained with a detergent procedure. Purity was controlled with light and electron microscopy and by estimating total phosphorus content. Amino acid and carbohydrate composition, including 3-hydroxyproline and sialic acid, were determined. Comparison of GBM and TBM from the same kidneys showed at all ages, that GBM contains more 3-hydroxyproline, sialic acid, mannose and hexosamine than TBM. Significant changes in the chemical composition were found during the first period of life, in GBM immediately after birth and in TBM during growth up to 10 years. The changes include an increase of the contents of 3- and 4-hydroxyproline, glycine, hydroxylysine, glucose, galactose and hexosamine and a decrease in the contents of histidine and lysine. These data indicate, that changes in collagenous and non-collagenous components arise with maturation. The results will be used for comparison with the chemical composition of renal basement membranes from different patients with congenital renal diseases.

## 170 ADAPTATION OF β-AMINO ACID TRANSPORT TO DIETARY CHANGE IN 2, 4 AND 8 WEEK RATS.

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Renal adaptation to deprivation of inorganic solutes has been observed, but adaptation to altered dietary intake of amino acid has not been studied. Using isolated renal cortical tubule segments the uptake of taurine (T) in breast fed (2 wk), weanling (w) (4 wk) and adult (A) (8 wk) rats under 3 dietary states was measured. Diets were high T (HTD), 3% T; normal T (NTD); low T (LTD), no T, low cysteine, methionine. (A) urinary T in µM/mg Cr ± SEM were HTD 17.1 ± 1.5, NT 3.6 ± 1, LTD .58 ± .14 showing enhanced urinary T reabsorption with LTD and diminished reabsorption with HTD. Uptake of 0.01 mM T was measured after 5 min incubation by isotopic distribution ratio (± SEM) and results are below.

| | HTD | p | NTD | p | LTD |
|---|---|---|---|---|---|
| A | 8.11 ± .24 | < .05 | 11.58 ± .43 | < .001 | 22.98 ± .48 |
| W | 11.73 ± .35 | < .001 | 19.97 ± .65 | < .001 | 27.14 ± .59 |
| 2 wk | 9.76 ± .14 | < .05 | 13.07 ± .44 | NS | 11.97 ± .91 |

Findings suggest renal adaptation to increased or decreased dietary amino acid occurs within 1 week of weaning. In the 2 wk rat there is decreased uptake with HTD and no difference between NTD and LTD. This suggests that adaptation to HTD is transmitted through breast milk but the tocsin for renal adaptation to LTD present in (A) and (w) is not transmitted to the 2 wk rat.

## 171 TAURINE TRANSPORT IN THE HUMAN KIDNEY.

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This study was performed to evaluate renal transport of taurine in the human kidney. Previous studies suggested that normal individuals have three distinct excretion classes which are under genetic control.

Four normal volunteers were given an oral load of taurine (260 mg/1.73 $M^2$) and urinary excretion measured. Then they were studied by classical clearance techniques using inulin as a marker of glomerular filtration. Following baseline determinations of taurine clearance, each subject was given increasing intravenous doses of B-alanine.

Following oral loading, three subjects excreted taurine at a rate of 3.8-5.6 uM/min, while one subject had an excretion rate of 0.14-0.34 uM/min. During baseline conditions, fractional reabsorption of taurine in the three high excretors ranged from 0.65 to 0.80. With B-alanine loading, fractional reabsorption of taurine decreased to 0.13 to 0. In the low excretor, fractional reabsorption of taurine under baseline conditions was 0.99 and decreased to only 0.55 during B-alanine loading.

These studies suggest the presence of both a high and low Km transport system for taurine in the human kidney which is shared by other B-amino acids. Our oral loading studies suggest that taurine transport is genetically determined by a pair of co-dominant alleles.

## 172 SERUM CARNITINE (CAR) AND DYSLIPIDEMIA IN CHILDREN UNDERGOING MAINTENANCE DIALYSIS.

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In adults on RDT has been shown that hemodialysis can deplete serum CAR levels. Since CAR is necessary for the complete oxidation of fatty acids, deviations in serum levels from normal may reflect alterations which would in turn disturb normal lipid metabolism. We have studied in 15 children, 3-12 years of age, dialyzed for 5 hours thrice weekly, serum CAR predialysis, at the end of dialysis and 3,6,12,24 hours after; the lipid pattern and the effects of oral CAR administration (100 mg/kg/day). It was observed a decrease in serum CAR in postdialysis (-43%) with a return to predialysis values within 6 hours. The decrease in serum was associated with an equivalent appearance in dialysate of CAR. The oral administration of CAR resulted in an increase in predialysis serum levels and in a more rapid return to normal values in postdialysis, within 3 hours. Lipid abnormalities were partly corrected with a decrease plasma triglycerides and FFA, with no modification of cholesterol.

## 173 ENDOGENOUS RENAL TRANSPORT OF FREE AMINO ACIDS IN CHILDREN WITH IDIOPATHIC NEPHROTIC SYNDROME (INS).

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**Endogenous renal transport of free amino acids was determined in 28 patients with INS aged 3-17 years. GFR measured concomittantly by inulin was 117.3 ml/min/1.73 $m^2$. Values of the serum concentrations, urinary excretion, renal clearance rates, net tubular reabsorption and percentage tubular reabsorption of 19 amino acids were determined by ion exchange chromatography. The results were compared with values of 12 healthy children without renal disease between the age of 2-13 years (Brodehl,J.,K.Gellissen,Pediatrics 42:395,1968). The serum values of aspartic acid, serine, cystine, tyrosine, ornithine and lysine were significantly higher and the values of phenylalanine and histidine lower in INS as compared to healthy children. The urinary excretion of isoleucine was higher, the excretion of methionine and histidine and the clearance rates of histidine and cystine were lower in INS. The net tubular reabsorption of proline, phenylalanine and histidine were significantly lower in INS. But the percentage tubular reabsorption of all amino acids did not differ significantly. During relapse and under the influence of corticosteroids percentage tubular reabsorption was lower.**

## 174 SOME ASPECTS OF TRYPTOPHAN METABOLISM IN CHILDREN WITH CHRONIC RENAL FAILURE /CRF/.

Fydryk J., Jacobson E., Chełkowska H., Graczyk G., Institute of Pediatrics, Pomeranian Medical Academy, Szczecin, Poland.

The aim of the study was to investigate serum tryptophan /TRY/ and non-esterified fatty acids /NEFA/ level, daily urinary excretion of 5-hydroxyindoleacetic acid /5HIAA/, xanthurenic acid /XA/ and kynurenic acid /KyA/ in not dialyzed children with CRF in basal conditions and after oral TRY load. The study covered 6 children with CRF /serum creatinine 2,2-20,5 mg/dl/ and 2 controls. Serum TRY, urinary 5HIAA, XA, KyA were determined by fluorometric method, serum NEFA with the use of Test Combination /Boehringer/. Only one child with the most severe CRF had decreased total TRY /2,34 µmol/dl/ and increased free TRY /90%/. After TRY load 5HIAA excretion increased in all CRF children while in controls it decreased. XA and KyA excretion increased in both CRF cases and controls. No correlation between serum NEFA and free TRY level was disclosed. Conclusion : TRY metabolism along serotonin pathway seems to be increased in CRF.