37 'SCREENING OF OUTPATIENT POPULATION FOR RENAL DISEASE'

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To evalute utility of routine urinalysis in detection of renal disease, 1000 children between 2-12 years attending outpatient department were studied with routine urinalysis for proteinuria, haematuria and casts; blood urea, serum creatinine, serum complement (C_3) estimation and renal biopsy when indicated.

Analysis of data revealed that 51(5.1%) cases had proteinuria of which 27 also had haematuria; 15 of these had a clinical picture of acute poststreptococcal glomerulonephritis (APSGN) with low C_3 levels. 1 had subacute bacterial endocarditis (S. B. E.) 1 snake bite, 3 gastroenteritis and 7 had fever. Serum complement levels were low in the cases of S. B. E., snake bite and 2 cases with fever which were labelled as silent nephritis. Of the 24 cases of proteinuria without haematuria, 1 was a case of minimal change nephrotic syndrome, while rest had transient trace proteinuria.

This study shows that urine examination is a simple and useful screening test for outpatient population to separate cases of proteinuria and haematuria, requiring special investigations to detect renal disease.

38 URINARY CONCENTRATION OF B_2 MICROGLOBULIN IN A PEDIATRIC POPULATION.

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Urinary B_2 microglobulin (B_2m) has been used to assess renal tubular dysfunction. Previously reported data established the normal range of B_2m to be 4-370 ug/liter in the urine of subjects 15 to 63 years of age, but no data are currently available for the pediatric age group. Using a commercially available kit (Pharmacia, Piscataway, N.J.) urinary concentrations of B_2m were measured in 95 subjects ranging in age from 1 day to 20 years in randomly collected early morning samples. For neonatal subjects age 1 day to 1 week the mean B_2m concentration was 138 ug/lit $\pm$ 22 ug/lit (Mean $\pm$ SE) N=55. In succeeding age groups values were: 1 to 2 months 88 $\pm$ 17.2 N=10, 8 to 10 months 29 $\pm$ 7.4 N=6, 1 to 5 years 30 $\pm$ 30.0 N=6, 6 to 10 years 47 $\pm$ 13.5 N=7, 11 to 15 years 47 $\pm$ 13.7 N=6, 16 to 20 years 63 $\pm$ 30.1 N=5. In addition, urinary B_2m concentration was measured in nine patients with vesicoureteric reflux. B_2m levels were not significantly different from values obtained from age-matched controls. This study suggests that high levels of B_2m are found in the urine during the first week of life and decrease to adult levels by one year of age. In addition, B_2m concentrations cannot be used as an index of renal impairment caused by vesicoureteric reflux.

39 SEDIMENT "ION CYTOLOGY IN URINE BY A NEWLY DEVISED SIMPLE APPARATUS.

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"Sedimentation Method" has been used in our institute to detect a small number of abnormal cells in the CSF of leukemic patients without cell distortion. This technique has been applied for urinary cytology in patients with UTI and urinarytract malignancy.

The Nishimura's fluid sedimentation chamber, a newly devised simple apparatus, consists of an open-ended plastic tube, an absorbent paper with a central hole, and a glass slide. These are stuck to each other with double-sided plastic adhesive tape with a central hole of equal size. Only o,2ml of fresh urine is needed to obtain enough cellular elements sedimented onto the glass in 20minutes. The details of white blood cells and other sediments can be seen by Wright stain.

One lymphoma patient with renal involvement showed lymphoma cells in urine by this technique in the early stage. The differentials of urinary white blood cells in patients with cystitis and pyelonephritis showed no disease specific pattern. Our sedimentation technique is very simple, inexpensive and reliable method for urine cytology.

40 PLASMA CREATININE DETERMINATION IN THE NEONATE: USE OF A KINETICS METHOD

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Plasma creatinine in newborns is elevated at birth and has been reported to stabilize at lower values only after several weeks. These elevated values resulting from renal and nonrenal phenomena have severely limited the use of creatinine in the neonate as an assessment of GFR. A kinetics method of creatinine analysis that minimizes the effect of noncreatinine chromogens was used to measure plasma creatinine in 38 newborns (66 determinations) during the first 4 weeks of life. Diagnoses included prematurity, transient hyperbilirubinemia, moderate RDS, and intrauterine growth retardation. Average creatinine concentrations (µmol/l) during the 1st and 2nd days of life were 96 and 73, with ranges of 59-188 and 18-185, respectively. All creatinine values (n=29) observed after 5 days of life except 1 (71) were below 48. The mean plasma creatinine observed in infants aged 5-30 days was 34, the range being 14-71. A transient, but significant increase in plasma creatinine (up to values of 101) was seen in 3 patients receiving gentamicin, a potentially nephrotoxic agent. We conclude that the kinetics method of creatinine determination, which requires only 50 µl of plasma, provides a valid index of renal function in neonates as early as the first days of life.

41 PREDICTION OF CHANGE OF GLOMERULAR FILTRATION RATE FROM CHANGE IN PLASMA CREATININE CONCENTRATION IN CHILDREN.

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Glomerular filtration rate (GFR) was measured by the ^{51}Cr-EDTA single exponential analysis slope clearance method (Chantler, C., and Barratt, T.M. Arch.Dis.Child. 1972, 47, 613), in 43 children aged 2-14 years with GFRs $\leq$ 90ml/min/1.73m^2, and was correlated with height (cm)/plasma creatinine concentration Pc (µmol/L), r = 0.923. Pc was measured by a reaction rate method (coefficient of variation 4%). The relationship between height/Pc and GFR varied as Pc tended to be lower than expected at lower GFRs so GFR was best expressed by the formula GFR = K x height/Pc, where K = 31 + (5 x height/Pc). There was a weak correlation between height/Pc and GFR in children (n = 51) with GFRs $>$ 90ml/min/1.73m^2, r = 0.401. Using the above formula GFR was then predicted in a second group of children (n = 30) with measured GFR $<$ 90ml/min/1.73m^2, and these correlated well, r = 0.903, S.D.of a single estimate $\pm$ 10ml/min/1.73m^2. The sensitivity of changes of height/Pc in detecting changes in GFR was tested in children with two or more measured GFRs $<$ 90ml/min/1.73m^2. The change in predicted GFR correlated with change in measured GFR (n = 84), r = 0.828, and the 95% confidence limits of a predicted change in GFR were $\pm$ 19ml/min/1.73m^2. Thus a predicted change of GFR in the range studied of $>$ 19ml/min/1.73m^2 between two single estimates reliably detected a change in GFR.

42 INDIVIDUAL KIDNEY GLOMERULAR FILTRATION RATE USING RADIONUCLIDES:

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The accuracy of a simple new method for glomerular filtration rate (GFR) was assessed by comparing it with the established multiple plasma sampling method in 101 consecutive children having a renal scan and serum B_2 microglobulin assay (B_2M).
A. Multiple plasma sampling method (M Plasm). Following a measured IV dose of technetium DTPA, this was calculated conventionally following samples at 120, 150 & 180 minutes.
B. Following the same dose of radionuclide, the information from a gamma camera viewing kidneys and precordium was captured onto a digital computer. From this information counts accumulating in the individual kidneys due to GFR were computed. A single plasma sample taken 20 minutes after injection furnished the plasma counts. From these two parameters individual kidney GFR was calculated.
C. B_2M was measured by radioimmunoassay using Phadebas B_2M kit.
The new method correlated well with M Plasm (r=0.80) and with B_2 microglobulin (r= -0.86). The correlation between M Plasm and B_2M was also good (r= -0.92). This new method is inherently attractive because: 1. It can be performed during the course of a normal renal scan without added radiation or trauma to the patient. 2. It is completed in 20 minutes. 3. It is theoretically applicable to patients with oedema or localised effusions. 4. It provides information with respect to individual kidney function.