HYPONATREMIA IN SICKLE CRISIS -- A DEFECT IN RENAL DILUTING CAPACITY. Eva Radel*, Joseph Kochen*, and Laurence Finberg, Albert Einstein Col. of Med., Montefiore Hosp. & Med. Ctr., Dept. of Pediatrics, The Bronx, New York.

Patients with sickle cell disease have a well known defect in renal concentrating ability. When in crisis these patients are usually treated with large volumes of intravenous and/or oral fluids. This study was prompted by the observation of several children in sickle crisis who developed severe hyponatremia with C N S symptoms while having high concentrations of sodium in the urine.

Patients with mild to moderate pain and/or infection were studied. On admission to the hospital 10/51 patients had sodium concentrations in serum below 135mEq/l. The mean osmolality of serum of 28 patients was 278mOsm/l, with 7/28 below 271mOsm/l. The urine osmolality was greater than the serum osmolality in 19/20, with a mean urine osmolality of 436mOsm/l and a range of 265 to 673mOsm/l. The ratio of sodium concentration in the urine to that in the plasma (U/P) was greater than 0.95 in 10/31 patients with a mean of 0.73. Creatinine clearances were normal or increased; free water excretion was reduced, and Na clearances were usually very high despite hyponatremia. These results indicate that the renal defect in sickle cell disease is not hyposthenuria, but rather a narrow range of solute concentration, with limited diluting as well as concentrating capacity. These patients have a tendency to lose excessive amounts of electrolyte in the urine, particularly during crisis, and are unable to handle a water load at these times. These findings have significant implications for supportive therapy.

IMPROVED PROGNOSIS OF POLYARTERITIS COMPLICATED BY RENAL FAILURE IN CHILDREN THROUGH CYCLOPHOSPHAMIDE TREATMENT. Ekkehard W. Reimold, Arthur G. Weinberg, Chester W. Fink and Norma D. Battles, Dept. of Pediatrics and Pathology, University of Texas Southwestern Medical School at Dallas, Texas.

The prognosis of polyarteritis in children is poor, particularly if complicated by early renal failure. Three girls, 9 to 10 years of age, have been treated with a combination of corticosteroids and cyclophosphamide. A complete remission of the disease ensued in all three cases.

An early diagnosis has been made by biopsies of the kidney or skin. All three patients initially were severely ill presenting with high fever, skin and joint manifestations, hypertension, and seizures. Additional complications included renal failure in two girls, primary pulmonary infiltrates in one, hallucinations in one. All three patients were started on Prednisone treatment (1.5-2 mg/kg) and after two to four weeks cyclophosphamide treatment (2 mg/kg) was added. After an initially stormy course all clinical symptoms gradually subsided and the renal function improved. Cyclophosphamide treatment was continued for up to 12 months. All three patients are now off medication for periods of 15 to 24 months with no or minimal residual symptoms. The creatinine clearance has returned to normal in two girls, proteinuria is still present in two patients. The additional administration of cyclophosphamide seems to effectively influence the disease process of polyarteritis leading to a resolution of infiltrates and necrosis which have not been accessible to therapy previously.

CLINICOPATHOLOGICAL SIGNIFICANCE OF HEMATURIA WITH AND WITHOUT PROTEINURIA IN CHILDHOOD. George A. Richard, Robert S. Fennell, Eduardo H. Garin, William H. Donnelly and R. Dixon Walker. Univ. of Fla. Col. of Med., Dept. of Ped., Gainesville (Intr. by Martin L. Schulkind).

During the past 6 years 381 children have presented to our department with hematuria. This report concerns 2 groups: A: 140 children with isolated gross and microscopic hematuria; B: 39 children with hematuria and proteinuria (excluding systemic lupus erythematosus (SLE) and poststreptococcal glomerulonephritis (GN). In group A biopsy was abnormal in 25/71. Focal GN and diffuse proliferative GN were the most frequent pathological changes (24/25) with fibrin seen by fluorescent antibody (FA) in 7/9. Determination of split products of fibrin (SPF), C'3, C'4 and serologic tests were not helpful in predicting an abnormal biopsy; however, periodic and isolated instances of elevated SPF were found (16/71). Urinary protein excretion and renal function have remained normal during follow-up. Five children (3 prior to renal biopsy) eventually developed renal calculi. In group B all biopsies were abnormal (39) including 23/31 with positive FA stains. Elevated SPF (10/34) and depressed C'3 (11/34) were associated with more severe renal structural and functional abnormalities. Increasing urinary protein (18/33), depressed GFR (15/39), and a concentrating defect (17/34) were noted during follow-up.

Isolated hematuria appears to be a benign condition in our department; however, hematuria associated with proteinuria may indicate significant underlying renal disease.

INCREASE IN TOTAL GLOMERULAR FILTRATION RATE DURING GESTATION. Jean E. Robillard, Leon Burmeister, Fred G. Smith, Jr. Univ. of Ia. Col. of Med., Dept. of Ped., Iowa City, Ia.

To date there have been no studies documenting the evolution of glomerular filtration rate (GFR) during fetal life.

In order to investigate this aspect, 33 fetal sheep ranging from 0.4 to 4.2 kg (80-143 days of gestation) have been studied, utilizing an intra-uterine fetal preparation. There was a significant correlation between the increase of actual GFR ml/min (AGFR) and the age of gestation ($p \leq 0.05$) or the weight of the fetus ($p \leq 0.01$) or the weight of the kidney ($p \leq 0.01$). However, there was no significant change when GFR ml/min/kg of total fetal weight (GFR-FW) or GFR ml/min/gm of fetal kidney (GFR-KW) was compared to the age of gestation or the weight of the fetus or the weight of the kidney.

	GFR ml/min	GFR ml/min/kg	GFR ml/min/gm
Age of gestation	$p \leq 0.05$	N. S.	N. S.
Weight of fetus	$p \leq 0.01$	N. S.	N. S.
Weight of kidney	$p \leq 0.01$	N. S.	N. S.

It thus appears that the AGFR increases during the last third of gestation without any significant increase in GFR whether expressed as ml/min/kg of fetal weight or ml/min/gm of kidney. The authors suggested that a parallel and constant increase in AGFR and in total fetal weight or kidney weight might explain the absence of variation in GFR-FW or GFR-KW during the last third of gestation.

INTRAVASCULAR COAGULATION IN ACUTE GLOMERULONEPHRITIS (AGN): Alan M. Robson, Barbara R. Cole, Norma Alkjaersig and Anthony P. Fletcher, Depts. Peds. & Med. Wash. Univ. Sch. Med. St. Louis.

Evidence exists that intrarenal intravascular coagulation occurs in certain renal diseases, but its role in the genesis of chronic renal disease remains controversial. Plasma chromatography (Fletcher et al., Trans. Amer. Assoc. Phys., 1970) was performed serially in 51 children with post-streptococcal AGN. This method quantifies the relative proportions of fibrinogen complexes, monomeric fibrinogen and fibrinogen derivatives smaller than fibrinogen in plasma. Intravascular coagulation/thrombosis is characterized by increase in fibrinogen complexes and fibrinolysis by increase in smaller fibrinogen derivatives. In the acute phase of AGN, the mean level of fibrinogen complexes was 19.2% (control 5%, $p < .001$). With diuresis, complexes fell to 12.2% (days 1-5) and 9.3% (days 6-10). Fibrinogen breakdown products were elevated in the acute and early diuretic phase, but significantly so only at 6 days and later (6-10 days, 35.8% vs. 23% control, $p < .01$). Pathological complex concentrations were found in those with the more severe disease. In the acute phase, factor XIII and α_2-macroglobulin were significantly reduced, antithrombin III was reduced but not significantly (mean 92% of control). Fibrinogen was raised in the acute phase, but only became significantly so in the early recovery phase (369 mg% vs. control 292 mg%, $p < .01$). After recovery from AGN, all parameters returned to control values. The study indicates that intravascular fibrin deposition, presumably intraglomerular, occurs during the acute stage of AGN, but resolves during recovery.

CONTROL OF HYPERTENSION IN WILMS' TUMOR BY THE USE OF PROPRANOLOL. Edward J. Ruley and Harold Magalnick (Intr. by Marvin Cornblath), Dept. Ped., Univ. of Maryland Sch. of Med., Baltimore.

Hypertension with elevated plasma renin activity has been frequently associated with Wilms' tumor. A 1 year old male infant with severe hypertension (BP 190/110) and a Wilms' tumor had a plasma renin level of 32 ng/ml/hr. Parenteral reserpine reduced the BP to 160/96 but induced diarrhea. Propranolol (2 mg/kg/6 hrs) induced a fall in BP to a range of 120-160/60-100. Omission of a single propranolol dose induced hypertension. Reinstitution of the drug caused a return of normotension. Following 2 days of vincristine and actinomycin D, the BP began to increase. Propranolol was increased to a maximum dose of 6 mg/kg/6 hrs. Plasma renin activity 14 days after propranolol therapy and 10 days after chemotherapy was 1.6 ng/ml/hr. Propranolol was discontinued after 25 days when the blood pressure had returned to normal. This drug appears to be indicated in hypertension associated with Wilms' tumor. Periodic plasma renin values appear to be useful in detecting metastases in patients with Wilms' tumor. (Supported in part by the Thomas Wilson Foundation.)