absorption of amino acids after birth in man and rat. In both species, loss of iminoaciduria precedes reduction of hyperglycinuria. This coincides with in vitro evidence in rat for phased "activation" of substrate-specific membrane carriers, the one for proline appearing early, that for glycine, late. "Activation" apparently involves appearance of new carrier proteins rather than gain in energy coupling to existing carriers, since studies of amino acid interaction during influx, heteroexchange and inhibition of energy metabolism indicate a specific initial lack of relevant carriers. However "maturation" of total amino acid transport in kidney also involves another component. By comparing Vmax for uptake in vitro of proline, glycine and α-amino isobutyric acid on carriers present from birth, we found their relative capacities to increase synchronously after birth. This is compatible either with increasing membrane area or with more efficient coupling of energy to transport. Thus changes both in specific activity of carriers and in total membrane activity characterize ontogeny of amino acid transport in kidney.

Clinical-pathological correlations in the nephrotic syndrome. A report of the international study of kidney disease in children. CHESTER M. EDELMANN, JR., *A. Einstein Coll. Med., N. Y.*

191 children with idiopathic nephrotic syndrome (absence of systemic disease or other known etiology) were studied from onset. Age and sex distribution were as expected. Renal biopsy revealed glomerulonephritis (GN) in ⅕; of these ⅘ were steroid nonresponsive (continued proteinuria after 8 weeks prednisone). Of patients with "minimal lesions" (ML), 5% were steroid nonresponsive; the other 95% were ⅓ frequent relapsers, ⅓ infrequent relapsers, and ⅓ nonrelapsers. In ML no difference in response or course was found with sex or age of onset. The overall poorer prognosis in ♀ and in older children was due to underlying GN. Only 38% with ML, but 52% with GN were ♀. >½ patients >8 years old had GN. Hematuria did not predict the clinical course in ML. Marked hematuria was present in 19% with ML but 64% with GN. Thus the poor prognosis associated with hematuria is due to the likelihood of underlying GN. Despite striking exceptions, urinary selectivity index correlated in a general way with pathology and steroid response. Immunization preceded onset only in patients with ML, suggesting that it may be an etiologic factor. No correlations with histology or course were found with history of allergy in patient or family, infection preceding onset, urinary tract infection at onset, or family history of renal disease. Although histology between groups based on father's occupation was similar, there were significantly more nonrelapsing patients in the professional group.

Correlations of selectivity of protein excretion in childhood nephrotic syndrome. JOHN T. HERRIN, and A. SALTZMAN (Intro. by John D. Crawford). *Harvard Med. Sch., Mass. Gen. Hosp., Children's Service, and Shriner's Burns Institute, Boston, Mass.*

Selectivity of proteinuria as measured by clearance ratios of transferrin and IgG were performed in 28 children with nephrotic syndrome. Selectivity correlated with response to steroid therapy, histology when available (16 patients) and was not related to degree of proteinuria or altered by therapy.

Radial diffusion methods (Mancini) using commercially prepared plates and values using the Ouchterlony method gave comparable results which remained constant, within the limits of the method throughout repeated testing.

Critical evaluation of results shows that high protein excretion is necessary for accurate prediction of steroid response. Preliminary studies suggest that calculation of selectivity is possible even at low levels of protein excretion by comparison of clearance of transferrin, IgG and α_2 macroglobulin performed on urine, in which the protein has been concentrated by lyophylization.

Plasma norepinephrine concentration before and after albumin infusion in nephrotic children. ROBERT C. KELSCH, GERALD S. LIGHT, and WILLIAM J. OLIVER. *Univ. of Mich. Med. Ctr., Ann Arbor, Mich.*

A reduction of effective plasma volume secondary to a decrease in the quantity of circulating protein is postulated to initiate edema formation in the nephrotic syndrome, however reduction of plasma volume has not been consistently demonstrated during active disease. Acute and chronic reduction of plasma volume is associated with an increased excretion of norepinephrine, presumably secondary to increased sympathetic activity. We therefore studied certain aspects of norepinephrine metabolism in thirteen children with the active nephrotic syndrome. All children were on a 1½–2 mEq/kg/day sodium intake and no diuretic therapy. Plasma norepinephrine concentration was measured on two consecutive mornings and again four hours later each day. Albumin (6–18 grams) was infused 3 hours prior to the second blood sample on the second day. All samples were obtained from the antecubital vein after the subject had remained at 30 degrees tilt for 20 minutes. Eight of the thirteen children had increased plasma norepinephrine concentrations in the early morning (> 0.5 ng./ml). The plasma norepinephrine concentration measured following albumin infusion was significantly reduced whereas that obtained on the control day was not. Urinary excretion of conjugated norepinephrine declined significantly within 48 hours after the initiation of prednisone treatment in these subjects. These data suggest the presence of increased sympathetic activity during the active phase of the nephrotic syndrome which can be altered by the infusion of albumin or the administration of prednisone.

Familial nephrotic syndrome with nephrocalcinosis and tubular dysfunction. EDMUND C. BURKE, GUNNAR B. STICKLER, KEITH E. HOLLEY, and LADISLAV P. NOVAK, *Mayo Clinic and Mayo Found., Rochester, Minn.*

We have studied 5 children in 2 families, 3 boys in family A and 2 girls in family B, who had the onset of nephrotic syndrome in early infancy. The syndrome proved to be steroid-resistant, although there was no evidence of tubular failure initially. Growth retardation, renal osteodystrophy, and tetany appeared in several at an early age, and all manifested these symptoms eventually. Glycosuria, aminoaciduria, and nephrocalcinosis also appeared. Renal biopsies from 2 children in each family showed glomerular proliferative changes, glomerular scarring, interstitial inflammation, and microcalcinosis together with marked tubular atrophy. Autopsy studies were completed on 2 boys. Each boy died when about 8 years old. One girl is preterminal with renal failure at 8 years of age. Hypertension was present only terminally. The youngest boy in family A has not yet developed nephrocalcinosis. Total-body composition studies on 1 boy and 2 girls showed increased exchangeable sodium, increase in extracellular water, decrease in total body potassium, and decrease in intracellular potassium. Whereas tubular failure previously has been reported in patients with long-standing nephrotic syndrome, we believe these cases differ in that they are familial and have interstitial nephritis and nephrocalcinosis.