Urinary solute excretion as an index of renal homograft rejection
Serial measurements of creatinine clearance and urine solute excretion were made in 53 of 64 patients after renal transplantation from living donors. Sixty-one of the 64 patients had undergone bilateral nephrectomy prior to or at the time of transplantation. Correlation of the clearance and excretion data with the clinical status of these patients permitted their classification into three groups. Group 1 (26 patients) was characterized by a decrease in creatinine clearance, a decrease in urine flow, and a greater decrease in urine sodium concentration. Urine sodium excretion was markedly decreased. These changes coincided with rejection of the homo-graft. Intensification of drug immunosuppression and in some cases local irradiation of the graft returned these abnormal parameters to prerejection levels in 19 of the 26 patients. Group 2 (23 patients) was characterized by a lack of deterioration in renal function following transplantation. No consistent pattern of solute excretion was seen. In 5 patients of this group, transient decreases in urine flow and solute excretion were due to dehydration and these changes reversed with re-hydration. Group 3 (4 patients) demonstrated impaired immediate function of the graft. The average operative ischemic time for the transplanted kidneys in this group was 54 min. Despite decreases in creatinine clearance, only minor changes were noted in urine solute composition, presumably because of ischemic tubular damage. It is concluded that the urine solute excretion pattern characteristic of renal homograft rejection (Group 1) is due to a reversible decrease in renal per-fusion and that recognition of this excretion pattern is clinically useful in the management of such renal homograft rejections.
Author’s address: Dr. D.A. Ogden, Chief, Renal Section, Veterans Administration Hospital, 1055 Clermont Street, Denver, Col. 80220 (USA).

Serial erythropoietin studies in patients undergoing renal homotransplantation
Plasma erythropoietin assays were performed on 10 patients before and after renal homotransplantation. Six patients were studied before bilateral nephrectomy, during the anephric state, and at intervals following transplantation. The 4 other patients underwent only unilateral nephrectomy and were studied before and/or after transplantation. No erythropoietin was detectable in any of the pre-transplant patients, regardless of whether bilateral nephrectomy had been done but was found post-transplant in 5 of the 10 patients. This study provides additional evidence for the contention that the kidney is the primary source of erythropoietin. It also demonstrates that the transplanted kidney is capable of resuming its role as an endocrine organ.
Author’s address: Dr. W.F. Denny, Medicine Research Department, Veterans Administration Hospital, Little Rock, Ark. (USA).

A patient is described who received a renal allograft from a living sibling donor and who over the course of the following 2 months developed 2 major episodes of transplant rejection with rather severe hypertension. The first episode occurred within 48 h of transplant and was associated with a marked increase in plasma renin activity and increased aldosterone excretion. This subsided over the following 2 weeks and renin levels and urinary aldosterone returned to normal. Another occurrence of hypertension, clinical rejection and increased plasma renin and urinary aldosterone occurred on post-operative day 38 (following subtotal parathyroidectomy) and subsided with the institution of high doses of prednisone. Eleven months after transplant the patient is normotensive without drugs and has normal renal function.

This case is cited as an example of intrarenal ischemia with activation of the renin-angiotensin-aldosterone mechanism occurring in the course of renal homo-transplantation.

Author’s address: Dr. J.C. Gunnells, Jr., Department of Medicine, Duke University, School of Medicine, Durham, N.C. (USA).

Hemodialysis: a successful therapy for chronic uremia


Experience with 22 patients in a community dialysis center is described and covers more than 40 patient treatment years. Three of the patients have died and the duration of dialysis ranged from 1-50 months with an average per patient of 20.9 months. Rehabilitation of the patient was excellent and most were able to perform useful employment. Problems such as cannulae clotting (average life of cannulae: artery = 12.4 mo. vein = 13.9 mo.) and infection (40 episodes – most often due to Staphylococcus), hypertension (5 patients require antihypertensive drugs), nutritional status (most patients gained some weight), psychological aspects, bone disease (9 patients have developed osteomalacia ± fractures), peripheral neuropathy (present in 7 patients, but severe in only 3), arthropathy, blood requirements (2.6 units/patient/month = average), hepatitis (5 patients and 3 staff members) and gastrointestinal hemorrhage (4 patients) are carefully discussed. The authors conclude that long-term hemodialysis is a practical and successful treatment for end stage kidney disease.

Author’s address: Dr. J. Pendras, Seattle Artificial Kidney Center, Swedish Hospital, Seattle, Wash. (USA).

The effects of peritoneal dialysis on the physiological disposition of oxa-cillin, ampicillin, and tetracycline in patients with renal disease


Seven patients with acute or chronic renal failure were studied several times in order to determine the disposition and distribution of oxa-cillin, ampicillin, and tetracycline in relation to peritoneal dialysis. Both the appearance of the intravenously administered antibiotic into the peritoneal fluid and the blood level of the drug after intraperitoneal use were studied. It was found that severe renal failure markedly prolonged the serum levels of ampicillin and tetracycline. Oxa-cillin, on the other hand, was not affected. Peritoneal dialysis did not alter the dosage requirements of any of the drugs. None of the drugs is absorbed in sufficient concentration from the peritoneal cavity to be effective systemically, although both ampicillin and tetracycline are absorbed to some degree. The author feels that, because of the potential adverse effects of tetracycline even at low levels, it should be abandoned in the local prophylaxis of peritonitis during peritoneal dialysis.
Death as a result of hyperglycemia without ketosis – a complication of hemodialysis
This short report describes a patient who underwent hemodialysis (Kil system) against 7 g/100 ml of glucose in the dialysis fluid and subsequently expired. He developed gross tremors, agitation and confusion approximately 3 h after the onset of the dialysis. Blood sugar was 3,400 mg/100 ml at the close of dialysis and 3 h later (after 20 units of regular insulin) it was 2,100 mg/100 ml. He died 3 h after dialysis of a cardiac arrest. Serum Na concentrations were normal as were HCG levels. The author feels the cause of death in this case was the hyperosmolality of the extracellular fluid and recommends that dialysate glucose concentrations be kept at 1.5 g/100 ml or below.

Psychological assessment of candidates for a hemodialysis program
The description of psychological characteristics in patients which affect adjustment to chronic hemodialysis has considerable urgency, both because of present limitations in treatment facilities with resulting selection problems, and because of the documentation of severe emotional reaction in certain patients. This paper outlines some inferences about the psychological requirements for successful adaptation to chronic dialysis which the ‘psychological team’ working with the Seattle group of patients has found useful. In addition, it presents: (1) Medical staff ratings, patients’ current levels of co-operation and emotional adjustment; (2) examines the relationship between these ratings and pretreatment psychological and psychiatric evaluations; (3) discusses some psychological characteristics which in the sample appear to differentiate between respectively ‘better’ and ‘poorer’ patients. The findings are somewhat limited by the fact that very few of the individuals within the Seattle group of patients showed grossly inadequate co-operation or emotional adjustment. However, variations that did exist in adjustment could be predicted at statistically significant levels from pretreatment psychological and psychiatric description of patients. The patients within this sample who were seen as adjusting most successfully appeared to be differentiated from the less adaptive patients in showing (1) higher intelligence, (2) a less defensive attitude about admitting to anxiety or emotional difficulty; (3) less reliance on emotional defenses that involve the use of physical symptoms (for example, hypochondriasis and hysteria), (4) more satisfactory emotional support from family members.

Prolongation of renal homograft survival by indwelling beta irradiation
Kidney homotransplants were performed in a series of dogs whose only immuno-suppressive therapy was radiation of the circulating blood by an intraarterial implant of 100 mc of 90Y, a beta-emitting isotope with a half-life of 64.6 h. All animals showed a marked lymphopenia, starting within 12 h of implantation of the 9iY and remaining at levels of less than 500 lymphocytes/mm3 for 3 weeks before returning slowly to normal. Furthermore, a loss of
lymphocytes from lymph nodes and spleen was a constant finding. Significant prolongation of functional survival of the homografts over those of the control series was achieved; the longest homograft survival was 34 days. The animals also showed immunologic depression to key-hole limpet haemocyanin antigen. The data suggest that irradiation of circulating blood by intraarterial 90Y implant is capable of reducing the immunologic response to renal homograft.

Author’s address: Dr. J.S. Wolf, Department of Surgery, Medical College of Virginia, Richmond, Virg. (USA).

Unattended overnight home hemodialysis


This report describes the experience of the Seattle group with hemodialysis in the home and details the various developments and changes in equipment and technique that have occurred. The monitors used to provide safe overnight dialysis include a ‘blood-in-effluent’ detector with an audible alarm which will awaken the patient if there has been a membrane leak allowing blood to escape into the dialysate. In addition, temperature, concentration and the negative pressure of the dialysate are monitored and the high and low limits are set by the patient so that if the alarm goes off, the patient is notified of the change, and the dialyzer is by-passed of dialysate to protect the patient. Alterations in arterial pressure are detected by measuring changes in the air pressure in a drip bulb located in the arterial extra-corporeal line. Most patients can be prepared for the home program in about two months. The patients undergo three, eight- to ten-hour dialyses per week, and the patient and spouse are carefully instructed in cannula care, in dialyzer attachment and disengagement, as well as how to operate the dialysis equipment and to build the Kii dialyzer. They also receive instructions in medical management. The medical problems encountered with the home program do not appear to be any different from those seen in a ‘hospital stationed’ patient group. The cost of home dialysis is estimated to be $12,800.00 for the first year, including equipment and remodeling (home) charges. The yearly expense is then stated to be $4,150.00. It is concluded that unattended overnight home dialysis is a convenient and safe way of maintaining patients with chronic renal failure.

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In addition, several patients have been satisfactorily maintained at home at some distance (California) from Seattle, under their local physician’s care.

Author’s address: Dr. J.W. Eschbach, Jr., Department of Medicine, University of Washington, Seattle, Wash. (USA).

A true hypercoagulability in patients on chronic hemodialysis


Because of the importance of cannula life to patients on long-term dialysis and because it appears that certain patients have a higher incidence of clotting than others, a systematic look at coagulation factors was undertaken. Factors II, V, VII, VIII, IX, X were measured in 17 chronic hemodialysis patients. An additional 17 non-uremic subjects served as ‘controls’. The results indicate that the dialysis patients have significantly increased levels of factors II, VII, X, IX, and VIII. There was considerable overlap in individual measurements, and the authors stress that this should be interpreted with caution. It was also found that when the dialysis patients were separated into ‘clotters’ and ‘non-clotters’, depending upon the number of previously clotted
‘shunts’, the data suggest that the ‘clotters’ had higher levels of these coagulation factors. Treatment of patients with clotting problems (‘clotters’) with Coumadin reduced the incidence of clotting to that of the remaining hemodialysis patients (‘non-clotters’). The authors suggest that Coumadin may be effective in controlling the hypercoagulability of patients on chronic hemodialysis because of its effect on these elevated coagulation factors.

Author’s address: Dr. R.V. Erickson, Seattle Artificial Kidney Center, The Swedish Hospital, Seattle, Wash. 98104 (USA).

Further observations concerning the use of lymph for extracorporeal dialysis

Four patients with severe renal failure are described who have been maintained by thoracic duct cannulation with extracorporeal dialysis and reinfusion of lymph. Technique for lymph dialysis is outlined and includes a patient attached lymph by-pass system period operated by means of a magnetic switch and roller pump. Four of the five patients who have been maintained by this method (one patient reported previously) have succumbed and short medical summaries are presented. The longest survivor was maintained for 150 days. It was found that the patients were clinically well and that this feeling of well-being did not correlate with the results of blood chemistries.

In evaluating the number of lymphocytes removed by way of the lymphatic fistula, it was noted that the number of lymphocytes in the lymph decrease with time and then appear to reach a ‘steady state’. Peripheral lymphocyte counts decreased in all patients and also tended to reach a ‘steady-state’. Although the serum albumin levels were in the normal range, there was some fall detected in gamma globulin. In addition to providing a satisfactory method for maintaining patients with chronic renal failure for short periods, the authors suggest that this technique might prove useful in producing alterations in recipient ‘immuno-tolerance’ in preparation for homotransplantation.

Author’s address: Dr. H. E. Sarles, Department of Medicine, University of Texas Medical Branch, Galveston, Tex. (USA).

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Pulmonary complications of peritoneal dialysis

The pulmonary complications of peritoneal dialysis are pneumonia, atelectasis, pleural effusion and acute purulent bronchitis. Three cases of pneumonia were described in a retrospective series using a standard procedure of peritoneal dialysis described by Maxwell et al. In order to evaluate the pulmonary complications of peritoneal dialysis, the authors modified the ‘standard’ (2 l of dialysis fluid in peritoneal cavity with gravity drainage) technique of dialysis. The modification involved a 1 and 2 l rapid cycle method in which 1 or 2 l of fluid were instilled into the abdomen, and after a 30 min equilibration time, were withdrawn by means of an aspiration pump. Pulmonary complications such as pneumonia, atelectasis, bronchitis, and pleural effusion were retrospectively recognized as complications of the standard procedure. In a prospective study in a small number of patients, it was found that such complications were decreased by the use of both the one and two liter rapid cycle method and that the one liter method was most effective in this regard. In addition, measurements of vital capacity in these patients indicated that the one liter technique also caused the least pulmonary restriction with peritoneal dialysis. This restriction is probably secondary to elevation of the diaphragms through distention of the
peritoneal cavity, leading to partial collapse of the lower lobes of the lung. Distention and pain were less with the one liter exchange, and it is recommended that one liter exchanges, each cycle lasting only 45 min be routinely used for peritoneal dialysis. It is also recommended, because of the higher incidence of these complications with prolonged dialysis, that the total duration of dialysis be about 24 h.

Author’s address: Dr. G. M. Berlyne, Department of Medicine, Manchester Royal Infirmary, Manchester 13 (England).

Hemodialysis in children: Technique, kinetic aspects related to varying body size, and application to salicylate intoxication, acute renal failure and some other disorders


Fifty-nine hemodialyses in 41 children, from 5 months to 16 years of age, 19 of whom were less than 3 years old, are the subject of this report. Twenty-two patients had renal failure from either acute or chronic renal disease and 19 had drug intoxication, 13 of which were due to salicylate. The twin coil hemodialyzer was used in all but one patient.

The most common cause of acute renal failure necessitating hemodialysis was acute glomerulonephritis. Acute renal failure occurred in 15 children among a group of about 100 hospitalized with acute glomerulonephritis. Eight of these youngsters required hemodialysis; three survived. Hemodialysis was only temporarily palliative in 3 children with the hemolytic-uremic syndrome and in 6 of 7 patients with renal failure from chronic disease.

Hemodialysis rapidly lowered the serum salicylate concentration in 11 of the 13 patients with salicylism who survived. Indications for hemodialysis in patients with salicylism included: Clinical manifestations of severe intoxication, particularly coma or semi-coma; relation between a given serum salicylate concentration and the time of ingestion of a single dose; ingestion of multiple doses, especially therapeutic overdosage in infants; failure to alkalinize the urine and lack of response to an osmotic diuretic; presence of oliguria or anuria; history of ingestion of more than a few ml of oil of wintergreen. Since salicylate may have a specific nephrotoxic effect, the presence of renal failure needs to be anticipated and ruled out as early as possible.

The dialysance of salicylate is approximately two-thirds that of urea. It is recommended that the dialyzer be perfused at a rate corresponding to the flow-limited region of the dialysance-blood flow curve. Therefore, optimal flow rates in children should not exceed 75 to 100 ml/min when using a single coil of the twin coil dialyzer. The function of the dialyzer could be predicted for subjects of any body size. At the end of the dialysis the plasma concentration of urea will be lower for a smaller subject, compared to a larger one. In this sense hemodialysis becomes more efficient with decrease in body size. It is felt that the ‘hyperefficiency’ of dialysis in small subjects may predispose to the dialysis disequilibrium syndrome.

The authors state that although a sheet-type dialyzer has more favorable characteristics for pediatric dialysis, safe dialysis can be carried out with the twin coil dialyzer, using either a single coil or the small twin coil in younger patients.

Author’s address: Dr. R. J. Kallen, Clinical Endocrinology Branch, National Heart Institute, Bethesda, Md. 20014 (USA).

Peritoneal and haemodialysis: A comparison of their morbidity, and of the mortality suffered by dialysed patients

The results of dialysis treatment in two concurrent series of patients given either extracorporeal haemodialysis or peritoneal dialysis have been presented with emphasis on the untoward complications of dialysis itself, and upon the overall mortality.

Peritonitis or abdominal haemorrhage occurred during 25% of the 109 treatments by peritoneal irrigation, and there was a mortality rate of 4% attributable to these. The 80 treatments by haemodialysis were associated with a 35% incidence of bleeding, cardiac arrhythmias or convulsions, and the mortality rate due to these was 5%.

When the patients were classified according to the cause of their renal failure, the mortality rate was similar to that in previously reported large series, but death rates due to uraemia, hyperkalaemia and heart failure were reduced, accounting for 14% of deaths when those due to irreversible renal disease were excluded. The proportion of deaths due to haemorrhage was unchanged, 12%, but that due to infection had risen to account for 59% of deaths other than those due to irreversible renal disease.

The results of this study, together with those of a parallel investigation of the efficiency, judged on clinical and biochemical results, of each form of dialysis (Stewart and Neale, 1966) indicate that in many clinical situations, the choice of dialysis has to be made carefully in order to avoid complications or inadequate treatment.

Reference

Author’s address: Dr. J.H. Stewart, Renal Unit and Department of Medical Research, Kanematsu Memorial Institute, Sydney Hospital, Sydney (Australia).

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The excretion of acid in unilateral renal disease in man

The excretion of acid by the diseased kidney was studied in unilateral renal disease in man by comparing the diseased kidney with the ‘normal’ or less affected kidney. Eight patients with parenchymal disease and four with stenosis of the main renal artery were examined.

In the patients with parenchymal renal disease (pyelonephritis, infarction, atrophy), the excretion of ammonium and titratable acid in the diseased kidney was decreased in proportion to the decrease in functioning nephron mass as estimated from glomerular filtration rate (GFR). Even after ammonium chloride loading, urine pH and ammonium and titratable acid excretion per unit of GFR remained similar in the diseased and normal kidneys. Hence, in the diseases studied no specific tubular defect could be demonstrated for either the secretion of hydrogen ions or the production of ammonia.

The proportionality between GFR and the tubular capacity to excrete acid observed in unilateral parenchymal disease was modified in the four patients with unilateral renal arterial stenosis in whom the urine from the affected kidney was acidified to a greater extent than that from the contralateral kidney.

Author’s address: Dr. P.R. Steinmetz, Harvard Medical School, Beth Israel Hospital, 330 Brookline Avenue, Bosíofi, Mass. 02118 (USA).

Kidney function during hypercalcemia / Le fonctionnement du rein dans les états d’hypercalcémie. Etude clinique et expérimentale
The influence of hypercalcemia on renal function and on plasma electrolytes was studied in clinical and experimental conditions.

I. Clinical data: Hypercalcemia was related to secondary neoplasm of bone in 14 patients; in 9 patients hyperparathyroidism was considered as the most likely diagnosis, one of these showed the features of an acute hypercalcemic crisis; Burnett’s syndrome was responsible of hypercalcemia in the last patient.

Hypercalcemia of most cancers though not that of parathyroid origin was accompanied by systemic alkalosis, hypokalemia and aciduria. A slight degree of potassium depletion occurred in 3 cases.

The phosphate/creatinine clearance ratio was increased in all cases.

(3) In most cases with hypercalcemia, renal insufficiency remained moderate. A severe degree of renal failure was never directly related to hypercalcemia, but associated with kidney stones or urinary infection.

II. Acute experimental hypercalcemia induced the following major changes in the urinary water and electrolyte excretion pattern:

A definite diuretic effect accompanied by an increase of the free water clearance was observed. H+ and NH4+ output by the kidney was markedly enhanced. Urinary bicarbonate decreased and chloride increased. A sharp raising of plasma inorganic phosphorus was invariably observed during calcium chloride infusions and in most cases the urinary excretion rose as a result of this procedure. Thus, it is obvious that hyperphosphoremia may not be considered as a consequence of reduced parathyroid activity.

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(5) Renal excretion of sodium and magnesium was well above control values during acute hypercalcemia. Potassium urinary excretion is not influenced by calcium infusion when tubular exchange mechanism of K is already stimulated by injection of sodium bicarbonate.

III. Chronic experimental hypercalcemia was induced by daily ingestion of 900,000 units of vitamin D3 without any calcium supplements. During the first weeks of this treatment, plasma phosphorus rose and daily urinary phosphate excretion was reduced; in most cases, blood pH and plasma potassium increased. After 6 to 10 weeks of vitamin D3 treatment, a definite hypercalcemic state developed. Glomerular filtration rate was reduced to about 50% of its control value. Alkalosis occurred, without potassium depletion. A chloride depletion of renal origin appeared most likely, but was not formally demonstrated.

Chronic hypercalcemia impaired ammonium production by the kidneys after NH4Cl loading. In dogs treated with toxic doses of vitamin D, blood calcium fell after ammonium chloride ingestion. At the same time, an increase of the glomerular filtration rate was observed.

Author’s address: Dr. M. Verbanck, Hôpital Universitaire Brugmann, Service de Gériatrie, 4, place Van Gehuchten, Bruxelles 2 (Belgium).

Metabolic alkalosis in patients with hypercalcemia

By Heinemann, H.O.: Metabolism 14: 1137-1152 (1965).

Hypercalcemia in patients with various neoplasms is not infrequently associated with metabolic alkalosis. This acid-base imbalance occurs despite the fact that hypercalcemia affects renal
function to reduce glomerular filtration and limit renal hydrogen ion (ammonia) excretion. The alkalosis of the extracellular fluid is apparently not caused by hydrogen ion loss from the body via either the gastrointestinal tract (vomiting), or the kidneys, nor is it due to contraction of the extracellular fluid volume, or potassium depletion. An alternate mechanism must, therefore, exist to account for the observed changes in arterial blood pH and serum bicarbonate concentration. The hypercalcemia seen in patients with neoplasms is presumably related to rapid demineralization or increased turnover of bone by either skeletal metastases or a parathyroid hormone-like substance released from the tumor. Bone has a large buffering capacity which is normally not readily accessible. Destruction or increased turnover of bone may make this buffering capacity available and therefore have an effect comparable to the administration of extra buffer. The metabolic alkalosis of hypercalcemia, documented in 20 patients, is according to the concept presented caused by the readily available buffering capacity of bone.

Author’s address: Dr. O. H. Heinemann, Department of Medicine, Francis Delafield Hospital and the College of Physicians of Surgeons, Columbia University, New York, N.Y. (USA).

The response of bone to metabolic acidosis in man

A metabolic acidosis was produced in obese women by a fasting regimen with no caloric intake. The acidosis was then partially corrected by administering NaHCO₃ while continuing caloric starvation. During acidosis the net negative calcium balance was 156 mg daily and during the alkali administration this calcium loss was reduced to 51 mg daily. It was calculated that the anions lost from bone accompanying the calcium loss would combine with 4-8 µmole H+ daily and thus act as a buffer for the extracellular fluid during the acidosis.

Authors’ address: Dr. M. M. Reidenberg; Dr. B. L. Haag; Dr. B. J. Channick; Dr. C. R. Shuman and Dr. T. G. G. Wilson, Temple University School of Medicine, Department of Pharmacology, 3420 North Broad Street, Philadelphia, Pa. 19140 (USA).

The one hour response to parathyroid extract in hyperparathyroidism and renal disease

We have previously shown, using inulin clearance as the glomerular filtration rate, that, when normal subjects are injected with 200 units of parathyroid extract (PTE), phosphate reabsorption (TRP) decreases immediately and reaches its lowest level in an hour. This procedure was simplified by using endogenous creatinine instead of inulin clearance. In this report we summarize our experience in 9 patients with primary hyperparathyroidism, in patients with kidney disease, and in normal subjects.

The normal TRP is 87% with a decrease of 14% ± 6 (range 6-40) in 1 h after PTE. Phosphate clearance increases, but the increase varies inversely with the initial level, and is influenced by changes in urine flow. Hyperparathyroid subjects are resistant to PTE in that the TRP does not change significantly. In kidney disease the response is normal unless the creatinine clearance is below 30 ml/min or the plasma creatinine above 2.5 mg/100 ml–when it becomes sluggish. In interpreting this response one must be aware that an increase in creatinine clearance after PTE in a normal or a decrease in a hyperparathyroid subject may give confusing results. With this provision, this response is helpful in distinguishing primary hyperparathyroidism in the presence of moderate kidney dysfunction.
The effect of a high intake of calcium carbonate in normal subjects and patients with chronic renal failure

Most patients with chronic renal failure absorb little or no calcium but remain in calcium balance (Stanbury, 1962 a, b). It has been demonstrated however that calcium absorption increases substantially during the administration of large amounts of calcium lactate (Liu and Chu, 1943) and calcium citrate (McDonald, Clarkson and de Wardener, 1964).

Calcium, phosphate and nitrogen balances were performed in five patients with chronic renal failure and three normal subjects before and during the daily ingestion of 20 g of calcium carbonate. During the ingestion of calcium carbonate there was a mean increase in calcium absorption of 34.8 mEq/day in the patients with chronic renal failure and 29.8 mEq/day in the three normal subjects. There was also a rise in plasma total CC\textsubscript{1\%} content and a fall in urinary hydrogen ion excretion. In the two individuals in whom the total CC\textsubscript{1\%} content was normal during the high calcium intake the fall in hydrogen ion excretion was of the same order as the rise in calcium absorption.

The results support the hypothesis that the diminished absorption of calcium in chronic renal disease is not due to a primary impairment of calcium absorption but is secondary to the diminished urinary calcium excretion caused by the renal disease (McDonald et al., 1964).

References

Author’s address: Dr. Evelyn M. Clarkson, Department of Medicine, Charing Cross Hospital Medical School, Fulham Hospital, London W. 6 (England).
dependent and probably related to increased resorption of bone, at least in response to acute administration of hormone. Presence or absence of growth hormone does not qualitatively influence the observed increase.

Authors’ address: Dr. C. Johnston, Jr. and Dr. P. Deiss, Jr., Departments of Medicine and Biochemistry, Indiana University School of Medicine, Indianapolis, Ind. (USA).

The nephrotic syndrome of childhood: Immunologic, clinical and pathologic correlations

This study was designed to clarify the significance of immunologic processes in the nephrotic syndrome of childhood. Renal tissue from 35 children with this disorder were studied by the immunofluorescent technique for IgG and betaic globulin deposition. Findings were correlated with the clinical course, and with pathologic changes seen by light microscopy.

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Twenty-two children showed no deposition of either IgG or betaic globulin. Most of these children had minimal renal changes by light microscopy and responded to steroid therapy. Clinically the patients of this group corresponded to the most commonly seen form of the nephrotic syndrome of childhood.

Seven patients showed a focal type of glomerular IgG and betaic deposition. Although the exact localization of these deposits was not clear they were not along capillary basement membranes. It was not possible to separate these patients clinically and pathologically from the group showing no immune deposits. A final group of 6 nephrotic patients whose glomerular basement membranes showed marked deposition of IgG and betaic globulin was defined. Renal pathologic changes in this group were marked and included subacute chronic and membranous glomerulonephritis. None of these patients responded to steroid therapy.

Levels of serum complement activity were determined in 10 of the patients. Normal values were obtained in the patients of the first two groups. It is concluded that immunologic mechanisms of a type thus far associated with the pathogenesis of renal disease are probably not operative in the majority of children with the idiopathic nephrotic syndrome. It is suggested that the basic abnormality is more likely to be a biochemical or metabolic defect which leads to episodic, potentially reversible changes in the permeability of the glomerular basement membrane.

Author’s address: Dr. K. N. Drummond, Renal Service, The Montreal Children’s Hospital, 2300 Tupper Street, Montreal 25 (Canada).

The chemical estimation of renal selective permeability to proteins during steroid-induced remission of the nephrotic syndrome

Measurements of renal selective permeability for proteins have been made using electrophoretic and Sephadex gel-diffusion methods. In six adults, whose nephrotic syndrome remitted fully with steroid therapy, no change in renal selective permeability was observed.

An algebraic method to represent renal selective permeability is described and applied to the data.

It is confirmed that the subjects who respond to steroid are those whose renal selective permeability for protein is maximal.

A modified ‘pore’ theory for renal protein permeability is put forward.

Author’s address: Dr. D.W. Vere, Medical Unit, The London Hospital, London (England).
Selectivity of proteinuria in the nephrotic syndrome
By Cameron, J.S.
In the nephrotic syndrome the glomerulus allows smaller proteins to escape into the urine more readily than larger; there is a general relationship between the urinary clearance of any plasma protein and its molecular weight (or diffusion coefficient). Clearance decreases as molecular weight increases. The sharpness of this cut-off varies from patient to patient; in highly selective proteinuria, little or no large molecular weight protein is excreted in comparison with the excretion of smaller molecular weight protein.
The selectivity of proteinuria in nephrotic patients may be assessed by measuring the urinary clearances of a number of plasma proteins by a double-diffusion immunochemical technique. The slope of the regression line log clearance against log m.w., gives a measure of the selectivity. This selectivity is independent of the amount of protein in the urine, and does not alter with spontaneous improvement or worsening of the disease, or upon treatment with steroids or with immunosuppressive drugs. Selectivity correlates however, very well with the histology seen on renal biopsy but especially well with the response to steroid therapy. Mild biopsy histology, highly selective clearances and good steroid responses are associated together.
The method used in these studies is clumsy and complex. A new method has been developed using radial diffusion techniques and employing the clearances of only two proteins: Transferrin and IgG. The clearance of IgG is expressed as a factor of the transfusion clearance to give the selectivity index. The method has been compared with the older one in 134 biopsy proven cases of glomerulonephritis with the nephrotic syndrome, and gives results as good. It is suggested that this simple test should be part of the assessment of all nephrotic patients.
References
Author’s address: Dr. J.S. Cameron, Guy’s Hospital, London, S.E.† (England).
Glomerulonephritis: A review based on 52 renal biopsies
The pathological findings in 52 renal biopsies are described, with emphasis on the changes seen in glomerulonephritis. There were 12 cases of poststreptococcal glomerulonephritis, 8 of idiopathic membranous glomerulonephritis, and 10 of lipoid nephrosis. Poststreptococcal glomerulonephritis is subdivided into acute and persistent phases, and the latter is further defined as subacute, latent or chronic. The characteristic but not specific lesion of poststreptococcal glomerulonephritis is the development of mesangial scars. In lipoid nephrosis there are subendothelial deposits in the glomerulus. Membranous glomerulonephritis is characterized by massive heterogeneous deposits on the outside surface of the basement membrane. It is
concluded that there are three well-defined types of glomerulonephritis, and although future studies may reveal interrelationships, the clinical and pathological evidence to date is sufficient to warrant their separate classification.

Author’s address: Dr. W.H. Chase, Department of Pathology, Faculty of Medicine University of British Columbia, Vancouver 8 (Canada).

Glomerular fine structure in post-streptococcal acute glomerulonephritis


The fine structure of renal glomeruli was studied in 29 renal biopsies from 24 patients suffering from acute glomerulonephritis of proven streptococcal etiology.

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Abnormalities seen by light microscopy in these biopsies were similar to those reported previously in this disease, and primarily involved the glomeruli. Characteristic humps were seen by electron microscopy on the epithelial aspect of the basement membrane in all cases biopsied within 39 days of the onset of disease. Such humps which were more widespread in tissue obtained early in the course of the disease, were not observed in repeat biopsies obtained 48 or more days after onset in 4 patients. It appears from the work of others that these humps may represent deposits of antigen-antibody complexes. Electron microscopy also revealed the presence of dense material, with the general staining and structural characteristics of basement membrane, between the proliferated intracapillary cells, together with areas of increased density within the basement membrane of the peripheral capillary loops. Certain differences were found between the morphological abnormalities occurring in children and in adults. Intracapillary cell proliferation was not as marked even in severely ill children as in some adult cases; the exudative type of response which occurs in a proportion of adults was seen only in one early biopsy from a child; and humps appeared to be more widespread in biopsies from children.

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Unilateral glomerulonephritis. Virtual absence of nephritis in a kidney with partial occlusion of the main renal artery


The authors present what they believe to be the first documented case report of unilateral glomerulonephritis in structurally normal kidneys. The patient was a 57 year old housewife with an ischemic kidney due to arteriosclerotic occlusive disease of the left main renal artery. She was hypertensive for many years before the appearance of red cells in the urine, suggesting that the renal artery occlusion may have occurred before the development of glomerulonephritis. Although slight focal hypercellularity was present in the ischemic left kidney, the biopsy specimen of the right kidney showed striking proliferative glomerulitis. The authors suggest that a unilateral reduction in renal blood flow may delay or interfere with the development of glomerulonephritis in an ischemic kidney while the disease progresses in the opposite kidney.

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Involvement of the heart and the lungs in acute glomerulonephritis in children

Involvement of the circulatory system seems to be common in patients suffering from acute glomerulonephritis. ECG abnormalities as evidenced by negative or flat T waves, though frequent, returned to normal within two weeks. X-Ray signs of congestion of the lungs with increased markings and hilar shadows were found in about 2/5 of the 51 patients studied. There was an occasional hydrothorax. The X-ray findings were prominent in the 16 children presenting signs of Congestive Heart Failure (dyspnea, rales and enlarged liver). These findings led to the conclusion that myocardial damage is present in children in the acute stage of glomerulo-nephritis.

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Goodpasture’s syndrome


A 24 year old male developed a sore throat followed by fatigue, pleuritic chest pain and blood-streaked sputum. Bilateral pulmonary hilar infiltrates were noted and shortly thereafter azotemia developed. The patient’s dyspnea improved markedly on prednisone therapy, but this was discontinued because of a renal biopsy demonstrating proliferative and fibrous obliteration of glomeruli. The patient became totally anuric approximately 4 months after the onset of the illness and complete anuria has continued for 15 months. The patient has been successfully maintained on intermittent hemodialysis and at present is hemodialyzed twice weekly for 12 to 15 h on a Kill dialyzer. There has been no recurrence of pulmonary hemorrhage during this interval.

Addendum: The patient is alive and showing progressive clinical improvement 26 months following the onset of the illness.

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Activation of systemic lupus erythematosus by drugs


A retrospective analysis of hospital records of 258 consecutive patients with systemic lupus erythematosus were analyzed for evidence of drugs possibly serving as ‘activators’ of the disease. In addition, a separate analysis was made of 935 additional charts representing all patients at 13 hospitals in the New York Metropolitan area diagnosed as having systemic lupus erythematosus during a four year interval. Hydralazine, diphenylhydantoin and isoniazid were suggested by the authors as playing an ‘activating’ role in the disease. The authors estimate that 3 to 12% receiving chronic drug therapy may have systemic lupus erythematous activated by such therapy.

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