a year earlier had settled and an oral contraceptive had been prescribed (ethinyloestradiol 50 µg and norethisterone acetate 1 mg). Blood pressure was 240/150 mm Hg; there was a haemorrhage in the right fundus; and a trace of proteinuria. Serum creatinine was 80 µmol/l (0.9 mg/100 ml). An intravenous urogram and isotope renogram showed delayed excretion on the left side. The left kidney was 12.5 cm long and the right 13.5 cm long. Renal arteriography (see figure) showed narrowing at the trifurcation of the left renal artery and a normal right renal artery. Renal vein plasma renin activity was 628 pmol/l/min (805 ng/l/min) on the left and 452 pmol/l/min (579 ng/l/min) on the right during recumbency, rising to 908 and 494 pmol/l/min respectively (1164 and 633 ng/l/min) on tilting the head up. Ex-situ repair of the vessel followed by autotransplantation was planned.

Renal arteriograms (a) in 1974 at first presentation and (b) in 1977 when hypertension recurred.

The kidney was removed, and a good length of artery and vein was preserved to allow reimplantation. Attempts to cool the kidney by perfusion were unsuccessful because of a very poor flow rate despite high perfusion pressure, and external cooling was applied. The wall of the artery was grossly thickened at its trifurcation and the branches were very small. The finest probe could not be passed through the narrowed area and no dilatation or reconstruction was possible. The kidney was therefore not reimplanted and the operation was concluded as a nephrectomy.

Histological examination showed fibrous thickening of the outer part of the media, intimal thickening, reduplication of the internal elastic lamina, and abnormal arrangement of elastic fibres in the media. These changes approximated most closely to the type designated perimedial fibroplasia.²

Blood pressure returned to normal without treatment within four days of surgery and remained so at review in February 1977. In April 1977 she again complained of headache, her blood pressure was 190/130 mm Hg, and a loud continuous bruit was audible in the epigastrium to the right of the mid-line. A right renal arteriogram (see figure) showed a tight stenosis at the bifurcation with post-stenotic dilatation of the lower branch, strongly suggestive of fibromuscular dysplasia of the artery. Blood pressure control was satisfactory at 160/100 mm Hg lying and 140/90 mm Hg standing, and renal function was stable, with serum creatinine 110 µmol/l (1.2 mg/100 ml) on treatment with methyl dopa, a thiazide diuretic, and propranolol.

Comment

This sequence of events emphasises the importance of conserving renal tissue in the surgical treatment of renal artery stenosis.³ The problems posed by the progression of fibromuscular dysplasia have been discussed,⁴ but they are not usually so acute as those presented in our patient. Because about 20% of operations to correct renal artery stenosis fail, often with loss of the kidney,⁵ the problem we have described will inevitably arise from time to time. The advantages of successful surgery for renal artery stenosis outweigh the risks in the young patient with two kidneys, especially in women with the prospect of pregnancy. When one kidney is already lost, however, surgery seems

justifiable only if the blood pressure cannot be controlled or renal function deteriorates.

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Requests for reprints should be addressed to Dr R Wilkinson.

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Seasonal variation in serum 25-hydroxycholecalciferol concentrations in elderly South African patients with fractures of femoral neck

Studies in Britain have shown a pronounced seasonal variation in serum 25-hydroxycholecalciferol (25-OHD₃) concentrations, the values being lowest in late winter.¹⁻³ Explanations include lack of exposure to ultraviolet light because of decreased hours of sunshine, the low angle of the sun to the horizon, increased atmospheric pollution, and the fall in daily temperature.

Johannesburg (altitude 1765 m, latitude 26°2'S) has large amounts of sunshine throughout the year. We therefore thought that there might be little seasonal variation in serum 25-OHD₃ concentrations and that low concentrations would be uncommon. We examined this further by analysing monthly serum 25-OHD₃ concentrations in elderly South African patients with fractures of the femoral neck.

Patients, methods, and results

Serum concentrations of 25-OHD₃ were measured in 232 elderly patients (mean age 72.7 ± SD 13 years) with fractures of the femoral neck between July 1975 and December 1976. Blood was taken as soon as possible after admission, and the serum stored at -20°C until assayed in batches using a competitive protein-binding technique.⁴ Interassay variation was 3.6%. Mean daily hours of sunshine and mean daily temperature in Johannesburg for each month of the study period were obtained from the weather bureau, Pretoria.

The mean serum 25-OHD₃ concentration for the whole group was 44.3 ± SD 23 nmol/l (17.7 ± 9.2 ng/ml). Individual values were highest in the summer and autumn months of November 1975 to June 1976, when the mean value was 51 ± 26.9 nmol/l (20.4 ± 10 ng/ml). The mean value for June to October 1975 and July to December 1976 fell significantly ($t=4.55$; $P<0.001$) to 38.1 ± 17 nmol/l (15.25 ± 6.8 ng/ml), and 14.4% and 21.5% of the patients had serum 25-OHD₃ values below 25 nmol/l (10 ng/ml) for these two periods respectively (figure).

Mean daily hours of sunshine for each month varied little during the study period, and the overall mean was 8.6 h/day. The late summer and autumn months of January to May 1976 had the least sunshine (mean 7.1 h/day). Mean daily temperatures fluctuated little during the spring, summer, and autumn (mean 17.0°C). The lowest mean temperatures were recorded during May to August 1976 (mean 10.4°C).

Comment

These patients had a significant increase in serum 25-OHD₃ values during the late summer and autumn, which have the least sunshine but the highest daily temperatures. Their values fell with the

Monthly variations in serum 25-OHD₃ concentrations in 232 elderly South African patients with fractures of femoral neck. Means ($\pm$ SE) are plotted for two-monthly groups.

Conversion: SI to traditional units—Serum 25-OHD₃: 1 nmol/l $\approx$ 0.40 ng/ml.

mean daily temperatures each month rather than the mean daily hours of sunshine. Even with a high mean level of daily sunshine some of the patients had low 25-OHD₃ concentrations compared with children from the same area, whose mean concentration was 76.75 nmol/l (30.7 ng/ml).⁴

The seasonal decline in 25-OHD₃ concentrations, therefore, may be related to a fall in environmental temperature, resulting in less time spent out of doors and greater skin coverage by clothing.

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Requests for reprints should be addressed to Dr J M Pettifor.

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Recovery from acute interstitial nephritis

Acute interstitial nephritis is a rare cause of renal failure, and its position as a distinct clinicopathological entity is only now becoming clear.¹ The condition is known to follow exposure to drugs (especially methicillin and other antibiotics) or infection (streptococcal, diphtherial), but idiopathic cases have been reported.

This report of an unusual case of renal failure due to acute interstitial nephritis of presumed streptococcal origin serves as a reminder of this diagnosis in patients presenting with unexplained renal failure and normal-sized kidneys. One similar case, in which recovery also occurred, has been reported.²

Case report

A 20-year-old van driver was admitted to hospital in December 1976 with a two-month history of vomiting, diarrhoea, abdominal pain, and weight loss after a "cold." He had previously been well apart from childhood asthma and had taken no drugs in the recent past. Examination showed no abnormality.

Investigations showed: haemoglobin 13.6 g/dl; erythrocyte sedimentation rate 114 mm in 1 h; serum urea 30.5 mmol/l (184 mg/100 ml), bicarbonate 30.5 mmol/mEq/l, creatinine 1150 μ mol/l (13 mg/100 ml), phosphate 1.82 mmol/l (5.6 mg/100 ml), urate 0.62 mmol/l (10.4 mg/100 ml); creatinine clearance 0.08 ml/s; and urinary protein 0.81 g/24 h (1.01 litre sample). Antistreptolysin O titre was 450 U/ml (six months later it was 600 U/ml). He was negative for antinuclear factor, complement levels were normal, and a throat swab and midstream specimen of urine were sterile. Intravenous pyelography showed normal-sized kidneys with smooth outlines but equal, poor excretion of contrast; the collecting system and ureters were normal. Urine analysis showed intermittent glycosuria, protein +, and microscopy showed a few red cell casts.

Renal biopsy was performed. Microscopy of the specimen (see figure) showed normal glomeruli but considerable tubular atrophy with an intense interstitial infiltrate of lymphocytes and histiocytes, which in places had a granulomatous appearance. These findings are in keeping with a diagnosis of acute interstitial nephritis.

Intense mononuclear infiltrate in interstitium. Several tubules show degenerative changes. (H and E. $\times$ 136.)

Our patient recovered clinically and biochemically over the subsequent month with attention to only diet and fluid and electrolyte balance. When last seen, six months after referral, he was well and laboratory investigations and urine analysis gave normal results, apart from the raised antistreptolysin O titre.

Discussion

Councilman recognised the pathological criteria of acute interstitial nephritis in 1898.³ The subject was well described more recently by Muehrcke.⁴ Nevertheless, only in recent years has a clinical picture emerged, which, as typified by our patient, consists of a non-specific presentation of acute or subacute renal failure with no obvious precipitant. The patient is usually normotensive and there is little or no oedema. A transient rash may be present. Examination of the urine shows minimal proteinuria, haematuria, pyuria, or casts. Eosinophilia and raised serum IgE concentrations have sometimes been found. Intravenous pyelography shows normal renal outline, kidneys of equal size and shape, and a normal pelvicaliceal system. Confirmation of the diagnosis by renal biopsy is necessary.

The pathogenesis of acute interstitial nephritis remains unproved, but the clinical course, the presence of eosinophilia, raised serum IgE, occasional reaginic antibodies or antibodies reacting against tubular basement membrane, the type of cellular infiltrate, and pathological similarities to rejected transplant kidneys strongly suggest an immunological mechanism.

A clear indication of prognosis in acute interstitial nephritis will not emerge before recognition of the condition is improved and more reports are collected. Recovery should probably be expected, however, when an offending drug or infection is removed. If recovery is prolonged or clinical deterioration occurs with conservative treat-