Individual kidney function in atherosclerotic renal-artery disease

Atherosclerotic renal-artery stenosis is usually an asymmetrical process and decisions to attempt revascularization have been made on the basis of renal size since the original paper by Morris et al. [1]. Results of intervention by angioplasty or surgery have been measured in terms of overall renal function even where unilateral arterial intervention has occurred [2]. We have introduced an estimation of individual renal function in atherosclerotic renal disease in our unit. We have combined two universally used tests [3,4], A 99m-Technetium dimercaptosuccinic acid scintigraphy (99mTcDMSA) scan to determine relative renal function and 51 Chromium ethylenediaminetetraacetic acid glomerular filtration rate (51Cr-EDTA clearance) to determine overall renal function. Both of these tests have been widely validated in renal disease.

From these two tests divided function and overall function were measured, enabling a simple calculation of individual kidney function. We have used a novel approach in that we have combined the two studies by performing them in parallel. This only involves a single patient visit to determine individual kidney function. No patient was on an angiotensin-converting enzyme inhibitor (ACEI) at the time of determination of individual kidney function. We have sought to compare the estimation of individual kidney glomerular filtration rate (SKGFR) with the routinely reported bipolar ultrasound length and individual kidney function. Although more sophisticated estimations of renal volume may be available under trial conditions the bipolar renal length is the clinical information available to most nephrologists.

Figure 1 shows the correlation of renal function, renal-artery anatomy and bipolar renal length. The average time between ultrasound and individual kidney function was 5.1 months (range -6 to 54). The renal-artery anatomy was defined as:

Normal. These were kidneys where either, (1) there was no stenosis on angiography but the contralateral kidney was either occluded or had renal-artery stenosis, (2) no renal-artery stenosis was demonstrated but aortography revealed widespread atheromatous disease.

Stenosis. These were kidneys where there was a stenosis of 50% or greater of the luminal diameter. These kidneys had not undergone angioplasty.

Occluded. These were kidneys where angiography failed to show a patent renal artery.

Angioplasty. These were kidneys where previously a renal angioplasty had been performed for renal-artery stenosis.

Stent. These were kidneys where an endovascular stent had been inserted at angioplasty. The mean time from angioplasty or stent to measurement of individual kidney function was 13.7 months, range 1–105.

The correlations were as follows:

Normal kidneys (n = 22) with no renal-artery disease but contralateral disease or aortic atheromatous disease correlation coefficient r = 0.46, P > 0.05; kidneys with renal-artery stenosis (n = 26) correlation coefficient r = 0.48, P < 0.05; kidneys which had undergone angioplasty or endovascular stenting (n = 15) correlation coefficient r = 0.12, P > 0.05; In paired SKGFR with a normal renal artery and contralateral renal-artery stenosis, it was surprisingly found that the function was greater in 6/11 pairs in the stenosed kidneys.

Although there was weak correlation between individual kidney function and bipolar renal length there was a striking spread of individual function for any kidney length. In the Normal group for a given bipolar length of 8–12 cm, individual kidney function varied from 4.4 to 73 ml/min, and in the Stenosis group there was a similar spread for a given bipolar length of 8–12 cm of 3.6–43.5 ml/min. In the Occlusion group there was, not surprisingly, poor function whatever the kidney length with, for a given bipolar length of 6–10 cm, a range of 0–11.3 ml/min. The largest kidney was 9.2 cm in length. The Angioplasty and Stent groups showed a pattern similar to the normal kidneys rather than the occlusion group with, for a given bipolar length of 8–12 cm, 5.7–61 ml/min. Once more there was a large spread of values of function for any kidney length.

We have attempted to gain more information on the function of individual kidneys in cases of atherosclerotic renal-artery stenosis. We feel that in routine clinical practice bipolar renal length is not a useful surrogate measure of individual renal function in atherosclerotic disease. Before attempting intervention, or in follow-up of intervention, some assessment of individual kidney function should be made. We would suggest that synchronous 99mTcDMSA scan and 51Cr-EDTA clearance could offer this test, as both are investigations already validated in renal disease and are in widespread use. Prospective studies of the use of sequential determinations of individual kidney function are needed in atherosclerotic renal disease. The estimation of individual kidney function would enable a better understanding of progressive dysfunction in individual kidneys as well as
helping with assessment of renal arteries for angioplasty or reinvestigation after angioplasty.

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Glomerulonephritis in sarcoidosis

Sir,

Some years ago we reported that the distribution of histological varieties of glomerulonephritis in patients with sarcoidosis differed from that in the general population [1]. In particular we noted that an apparent significant association with membranous glomerulonephritis reflected a dearth of minimal-change disease in sarcoidosis. The case report of Parry and Falk [2] underlines this rarity. Their patient was also atypical in being steroid resistant and having renal impairment.

We believe that the extreme rarity of typical minimal-change disease in sarcoidosis could hold clues to the immunological mechanisms underlying the aetiology and/or the expression of minimal-change disease [3].

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A case of membranous glomerulonephritis associated with adenocarcinoma of pancreas

Sir,

Membranous glomerulonephritis (MGN) is relatively often associated with malignancies but there is only one previously reported association with carcinoma of pancreas [1]. We have recently reported a case of urinary peritonitis as a complication of renal biopsy which revealed early MGN [2]. The same patient was unfortunate enough also to have pancreatic carcinoma which was detected a few months after the onset of his renal disease.

We refer to the case report for details [2]. Briefly, a 70-year old man came to emergency for general oedema and dyspnoe.

Hypercholesterolaemia of 10.6 mmol/l had been detected 5 months earlier, and treatment with simvastatin had been initiated 5 weeks prior to admission. His blood pressure was normal. He had severe hypoalbuminaemia and mild anaemia. Serum creatinine and liver enzymes were normal. On chest X-ray, he had cardiac decompensation with pleural effusion and slight interstitial oedema. Proteinuria was 11.0 g per 24 h. Treatment with diuretics corrected the cardiac decompensation and ameliorated oedema. Ten mg of enalapril per day was initiated. On ultrasound, all intra-abdominal organs appeared normal. A biopsy from the left kidney revealed early MGN. The glomerular walls appeared evenly thickened, the epithelial surface was hairy or spiky, and there were unevenly distributed subepithelial deposits. The interstitium was slightly fibrotic and scarcely infiltrated with mononuclear inflammatory cells. There was slight focal atrophy in the tubuli. On immunostaining, the glomerular capillary walls showed strong granular staining with anti-IgG-antibodies and moderate staining with anti-C3-antibodies. After the renal biopsy, a large perirenal fluid accumulation and, a few days later, urinary peritonitis developed, due to ureteral occlusion by a clot, and to a urinary fistula through the site of renal biopsy. In laparotomy performed for peritonitis, the intra-abdominal organs including pancreas appeared normal on palpation. The urinary fistula healed with pyelostomy and peritoneal drainage. The patient had a medication of enalapril as above, 40 mg of furosemide twice daily, and 20 mg of simvastatin once daily. Two months after the primary admission, after the patient had recovered the complications of renal biopsy, a screening for malignancies was performed. It remained negative, as well as serology for hepatitis B and C, and for antinuclear antibodies.

The MGN was considered idiopathic. Prednisone 30 mg daily and omeprazol as ulcer protection were initiated. One month later, the patient was in a moderate condition, and serum albumin had slightly risen. Two months after the initiation of prednisone, the patient’s condition and laboratory results were unchanged, except that serum potassium had decreased to 3.5 mmol/l. Furosemide was reduced. After receiving prednisone for 3 months, the patient’s general condition deteriorated, his weight was reduced by 10 kg, and his blood pressure was 95/60 mmHg. Blood glucose had risen to 9.4 mmol/l. Proteinuria was 8.1 g per 24 h. Other laboratory results were unchanged. The medication was generally reduced, prednisone included. Three weeks later, the patient came to the emergency for malaise, appearing exhausted, dehydrated, and slightly confused. He was normotensive, slightly tachycardic, and his abdomen was diffusely tender. Hyperglycaemia of 31.3 mmol/l and hyponatraemia were detected, but there was no acidosis. Serum albumin had slightly decreased. Insulin treatment and rehydration with saline were initiated.

The first day after hospitalization, serum alanine amino transferase, alkaline phosphatase, and plasma ammonium were elevated 3- to 10-fold. On abdominal ultrasound, a tumour of pancreatic cauda 4 cm in diameter, and multiple hepatic metastases were detected. A cytological sample of the pancreatic tumour was obtained under ultrasound control. It showed incoherent tissue with strong atypia, the cells having hyperchromatic and enlarged nuclei, and relatively much vacuolized cytoplasm. The overall cytological picture matched ductal adenocarcinoma of pancreas. Diabetes was cured by cessation of prednisone. The patient refused chemotherapy, continued to deteriorate, and passed away after 19 days of hospitalization. His family denied autopsy.

We report here a case of MGN associated with pancreatic