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Cutaneous microcirculatory dysfunction in peritoneal dialysis patients

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Introduction

Microvascular impairment is an early step in cardiovascular disease (CVD), the major cause of morbidity and mortality in patients with CKD. Changes in skin microvascular reactivity have been shown to reflect more widespread changes in the systemic and coronary microcirculation. Microvascular function is attenuated by advancing age and conditions that commonly coexist with CKD such as diabetes and hypertension. We investigated whether skin microvascular reactivity is impaired in peritoneal dialysis (PD) patients compared with healthy controls and whether this impairment is independent of comorbidity.

Methods

Forearm skin vasculature was examined in 28 patients on PD. 28 healthy controls and 28 controls matched to the PD patients for age, gender, diabetes and previous CV events were selected from a cohort of patients previously studied in our laboratory. Microvascular function was assessed using laser Doppler flowmetry in combination with post-occlusive reactive hyperaemia (a test of generalised microvascular function) and iontophoretic application of acetylcholine (ACh) and sodium nitroprusside (SNP) to investigate endothelium dependant and non-endothelium dependant vasodilation respectively.

Results

Peak post-occlusive flow (measured in arbitrary units AU) was significantly lower in the PD patients than in both the healthy controls and the co-morbidity matched group; 90.45 AU [60.9-128.35] in healthy controls, 74 AU [58.8-134.4] in matched controls and 56.95AU [45.1-89.8] in PD patients (median [IQR] p=0.03 healthy controls versus patients, p=0.04 matched controls versus patients). SNP-mediated vasodilatation was significantly lower in the PD group compared with healthy controls (p= 0.016), the response to ACh was also lower but did not reach statistical significance. ACh and SNP-mediated vasodilatation trended towards being lower in PD patients than matched controls but did not reach statistical significance.

Discussion

The PD patients were characterised by a generalised dysfunction of the skin microcirculation compared with healthy controls and controls matched for factors known to affect the microcirculation. This appears to be the result of defects in multiple vasodilatory pathways.