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High BMI among adult haemodialysis patients at a UK hospital: an indicator of poor or adequate nutritional status?

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In the general population obesity is associated with increased risk of morbidity and mortality. In contrast, studies indicate better survival among overweight/obese HD patients^{1,2}. However, it should not be forgotten that obesity (excess weight) does not necessarily imply good nutritional status as muscle wasting can occur, concealed by fat accumulation, a condition called “sarcopenic obesity” (SO)³. SO has several metabolic implications including inflammation⁴ and increased risk of cardiovascular events⁵ which are also known to be the leading causes of mortality in chronic kidney disease (CKD) patients. This study aimed to audit the nutritional status and biochemical parameters of UK haemodialysis (HD) patients and to compare these parameters between dialysis settings.

Current patients who had been receiving treatment for at least 6 months at one hospital (via home or satellite unit HD) were eligible for inclusion. Parameters under observation were BMI, serum albumin (Alb), CRP, Adjusted Calcium, Phosphate, iPTH, Urea, Creatinine, Haemoglobin and Ferritin levels with data extracted retrospectively from patient records. Data were analysed using SPSS version 22 and for each biochemical parameter the proportion of patients achieving, exceeding or below the K/DOQI (2006) reference range standards was calculated.

One hundred and forty seven patients were included in the audit (46 receiving home and 101 satellite HD). BMI, Alb and CRP levels raised concern in the sample as a whole (see Table). Only Alb was significantly associated with HD setting with status being better in home HD patients (BMI: $X^2 = 3.33$, $p = 0.18$; Alb: $X^2 = 3.68$, $p = 0.03$; CRP: $X^2 = 0.57$, $p = 0.45$).

STATUS	HOME			SATELLITE		
	BMI (n = 41) % (n)	ALBUMIN (n = 45) % (n)	CRP (n = 44) % (n)	BMI (n = 99) % (n)	ALBUMIN (n = 98) % (n)	CRP (n = 95) % (n)
Below normal range	0.0 (0)	88.9 (40)	0.0 (0)	3.0 (3)	98.0 (96)	0.0 (0)
Within normal range	26.8 (11)	11.1 (5)	38.6 (17)	35.4 (35)	2.0 (2)	30.5 (29)
Above normal range	73.2 (30)	0.0 (0)	61.4 (27)	61.6 (61)	0.0 (0)	69.5 (66)

The majority of patients had a BMI above the healthy range (overweight or obese (>25 kg/m² BMI)). High CRP (>5 mg/l) and low albumin levels (<40 g/l) were also observed in the majority of the sample.

Although high BMI as a marker of good nutritional status has been positively associated with improved survival in HD patients^{1,2} an increased CRP and decreased albumin indicate an inflammatory state and have been associated with loss of lean muscle mass and increased cardiovascular mortality (defined as the ‘malnutrition, inflammation syndrome’)^{2,3,4,6}. This raises concern as to whether the BMI levels observed in this sample of HD patients indicate better nutrition or increased health risk and whether there is indeed no significant difference in nutritional status between the two settings regardless of differences in albumin status. Further research to investigate this via appropriate measures for muscle mass, strength and physical performance are required⁶ to ascertain the impact of the inflammatory state on body composition and nutritional status of these patients in order to inform appropriate nutritional intervention.

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