PROTEIN NUTRITIONAL STATUS IN CHILDREN WITH CHRONIC RENAL FAILURE AND SHORT STATURE

L.A. BAUR, J.F. KNIGHT, B. CRAWFORD, B. MOORE, L.P. ROY, *B.J. ALLEN and K.J. GASKIN

Chronic renal failure (CRF) in childhood is often associated with anorexia and short stature. The latter may be at least partly due to protein energy malnutrition. However, the measurement of nutritional status in CRF by traditional means such as weight, body fat and lean body mass is inaccurate in the presence of fluid and electrolyte disturbances. The recent development of the low dose radiation technique of in vivo prompt gamma neutron capture analysis allows total body nitrogen (TBN) to be measured directly (Baur et al. 1991). The aim of this study was to assess body nitrogen content in children with CRF and short stature.

Seventeen patients (10 male, 7 female; 9 prepubertal) who had CRF (glomerular filtration rate < 30 ml/min/1.73m^2 or with renal transplant) and height standard deviation (SD) score < -2.00 had measurements of anthropometry, bone age and TBN performed. Results were compared with data from 43 normal children (18 male, 25 female; 27 prepubertal) and are shown in the table below (means $\pm$SD given).

	Renal (n=17)		Normal (n=43)
Age (y)	12.90$\pm$3.20	*	10.34$\pm$3.34
Height SD score	- 4.09$\pm$1.42	†	- 0.02$\pm$0.92
Weight SD score	- 2.40$\pm$1.00	†	- 0.06$\pm$0.76
TBN (g)	645$\pm$265	†	930$\pm$365
TBN/Height (g/cm)	4.92$\pm$1.47	†	6.53$\pm$1.82
TBN/Weight (g/kg)	21.60$\pm$2.50	†	26.60$\pm$2.60

* $P < 0.05$, † $P < 0.01$

Even after adjustment for age, height, weight or bone age, by analysis of covariance, the CRF patients still had significantly decreased TBN values compared with the normal subjects.

These results demonstrate that children with CRF and short stature have reduced body protein stores. Protein energy malnutrition may be a contributing factor to growth impairment in children with renal failure.

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The Children's Hospital, Camperdown, NSW 2050 * A.N.S.T.O., Lucas Heights, NSW 2234