British Journal of Nutrition (2001), **85**, 509–510
DOI: 10.1079/BJN2000295

Letter to the Editors

Undernutrition in hospitals

We welcome the commentary of Elia & Stratton (2000) on our paper (Corish *et al.* 2000) and hope that a wider debate will follow on how we should define undernutrition. To help in that debate, we would like to clarify some of the methodological issues raised in the commentary. For ease of comparison with previously published reference data, we measured mid-arm circumference and triceps skinfold thickness (TSF) of the right arm in patients aged under 65 years (Bishop *et al.* 1981) and the left arm in those aged ≥65 years (Burr & Phillips, 1984). McWhirter & Pennington (1994) did not specify which arm was measured in their subjects.

We measured knee height using the equipment and procedure employed by Chumlea *et al.* (1985). Although this method was originally validated in elderly white Americans, knee height was also reported to reflect accurately standing height in elderly people living in Edinburgh, UK (Bannerman *et al.* 1996). We found a good correlation between knee height and standing height in a small number (*n* 36) of our patients for whom both measures were available (mean difference 1 cm; 95 % limits of agreement −2·2 cm – +3·1 cm).

The criteria used to define undernutrition in the Dundee, Scotland, UK, study were a BMI <20 kg/m^2 and a mid-arm muscle circumference (MAMC) or TSF <15th percentile compared with the reference data. We found a number of patients who had a BMI <20 kg/m^2 but whose MAMC or TSF were above the 15th percentile. This has been found in all studies using the Dundee criteria (Edington *et al.* 1996, 1997, 2000). Like Elia & Stratton (2000), we are perplexed that fewer patients had a BMI < 20 kg/m^2 than the total number undernourished in the Dundee study (McWhirter & Pennington, 1994).

Elia & Stratton (2000) wondered how we calculated the 15th percentile. It is only possible to derive a precise value for the 15th percentile if one has access to the raw data from which the reference tables were developed. Lacking this data, we estimated the 15th percentile by adding a third of the difference between the 10th and 25th percentiles to the figure given for the 10th percentile. However, any inaccuracy in our method of estimating the value of the 15th percentile could not account for the discrepancy in the prevalence of undernutrition between Dublin, Republic of Ireland, and Dundee. Interestingly, the most recent study examining the prevalence of undernutrition in the UK has reported a prevalence of only 7 % using the criteria of McWhirter and Pennington (Edington *et al.* 2000). According to the authors, the lower prevalence could partly be explained by the omission of a number of the sickest patients who could not be measured or who could not give informed consent. This could not explain the lower prevalence we found in Dublin, as informed consent was obtained from the next of kin if the patient was unable to provide it and we used surrogate measures of height (*n* 95) and weight (*n* 50) when these could not be measured directly. This was done to ensure that a representative sample was obtained, including the sickest patients.

We would like to draw attention to two small errors made by Elia & Stratton (2000). First, they say the possibility exists that the population in Dublin is leaner than in Dundee when we assume they mean the reverse. Second, we measured every 10th patient in the larger and every 3rd patient in the smaller hospital, not the reverse as incorrectly understood by Elia & Stratton (2000).

In conclusion, we agree that defining disease-related malnutrition is a goal worth pursuing. We wish to urge all involved in the nutritional management of patients in hospital to gather outcome data on patients at nutritional risk. More complete information is needed to provide a reliable perspective of the benefits and risks of our therapeutic nutritional interventions.

Clare A. Corish
Nicholas P. Kennedy
Department of Clinical Medicine
Trinity Centre for Health Sciences
St. James's Hospital
Dublin 8
Republic of Ireland

References

Bannerman E, Chapman N, Cowan S, Reilly JJ, Kirk T, Maclennon WJ & Pender F (1996) Evaluation of the use of knee height to estimate stature in individuals ≥75 years living in Edinburgh: implications for the determination of body mass index. *Proceedings of the Nutrition Society* **55**, 249A.

Bishop CW, Bowen PE & Ritchley SI (1981) Norms for nutritional assessment of American adults by upper arm anthropometry. *American Journal of Clinical Nutrition* **34**, 2530–2539.

Burr ML & Phillips KM (1984) Anthropometric norms in the elderly. *British Journal of Nutrition* **51**, 165–169.

Chumlea WC, Roche AF & Steinbaugh ML (1985) Estimating stature from knee height for persons 60–90 years of age. *Journal of the American Geriatric Society* **33**, 116–120.

Corish CA, Flood P, Mulligan S & Kennedy NP (2000) Apparent low frequency of undernutrition in Dublin hospital in-patients: should we review the anthropometric thresholds for clinical practice? *British Journal of Nutrition* **84**, 325–335.

Edington J, Boorman J, Durrant ER, Perkins A, Griffin CV, James R, Thomson JM, Oldroyd JC, Smith JC, Torrance AD, Blackshaw V, Green S, Hill CJ, Berry C, McKenzie C, Vicca N, Ward JE & Coles SJ (2000) Prevalence of malnutrition on admission to four hospitals in England. *Clinical Nutrition* **19**, 191–195.

Edington J, Kon P & Martyn CN (1996) Prevalence of malnutrition in general practice. *Clinical Nutrition* **15**, 60–63.
Edington J, Kon P & Martyn CN (1997) Prevalence of malnutrition after major surgery. *Journal of Human Nutrition and Dietetics* **10**, 111–116.
Elia M & Stratton RJ (2000) How much undernutrition is there in hospitals? *British Journal of Nutrition* **84**, 257–259.
McWhirter JP & Pennington CR (1994) Incidence and recognition of malnutrition in hospital. *British Medical Journal* **308**, 945–948.