Proceedings of the Nutrition Society (2011), **70 (OCE5)**, E262 doi:10.1017/S0029665111003478

Malnutrition Matters, Joint BAPEN and Nutrition Society Meeting, 29–30 November 2011, Harrogate

Estimation of stature from ulna length and demispan in healthy adults (18–64 yrs)

G. E. Jones, S. J. Beech and C. Wright

Faculty of Applied Health Sciences, University of Chester, Parkgate Road, Chester, CH1 4BJ, UK

The Malnutrition Universal Screening Tool (MUST) is regularly used to screen patients in hospitals and the primary care setting. The MUST score relies on accurate measurements of body mass and standing stature in order to correctly identify those at risk of malnutrition[1]. However, it is not always possible to measure standing stature due to lack of suitable equipment, or because some patients are unable to achieve their maximum standing stature. Therefore alternative surrogate methods and equations for predicting stature are required. Ulna length[1] and demispan[2–4] have both been proposed as acceptable alternatives to standing stature and consequently adopted by the MUST. The aim of the study was to evaluate the recently updated demispan equation[4] and compare it to the existing ulna length equation[1].

550 healthy males and females (30.5 ± 13.1 yrs) participated in the study. All measurements were taken using existing standardised methods[1,3,5]. Standing stature was measured using a calibrated stadiometer; ulna length and demispan were measured using a non-stretch tape, and taken in triplicate with the mean used to calculate predicted stature[1,4]. Pearson's correlation coefficient was calculated to assess the association between ulna length, demispan and standing stature; and a paired samples t-test was used to examine differences between standing and predicted stature. Ethical approval was granted by the Department of Clinical Sciences, University of Chester.

Moderate significant correlations were seen between ulna length, demispan, and standing stature for females ($r = 0.57$ and 0.59 respectively), with high significant correlations seen for males ($r = 0.78$ and 0.90 respectively). Both surrogate methods for predicting stature showed a similar trend between the gender groups, overestimating for ulna length and underestimating for demispan (Table 1). Although the degree of bias between predicted and standing stature for both genders was comparatively small, paired samples t-test showed significant differences between predicted stature and standing stature for males. There was no significant difference for females; however there was large inter-subject variability.

		Standing stature (cm)		Ulna length predicted stature (cm)	Demispan predicted stature (cm)
	n	Mean	SD	Mean and 95% CI diff	Mean and 95% CI diff
Female	275	164.0	5.7	164.4 (0.37 (95% CI −0.21, 0.95))	163.7 (−0.37 (95% CI 0.94, 0.20))
Male	275	177.8	6.8	179.0* (1.16 (95% CI 0.65, 1.67))	176.7* (−1.11 (95% CI −1.48, −0.74))

Data presented as mean and SD (cm), and mean difference with 95% Confidence Interval of difference. Paired samples t-test significant differences: $*P < 0.001$

This study, with its modest sample size, demonstrates that despite the convenience of predicting stature from ulna length and demispan, the results, for males and females, should be interpreted with caution due to large inter-subject variability. This in turn could have a negative impact on the MUST score, and subsequent management guidelines followed, for the patient.

1. Elia M (2003) The 'MUST' Report. Redditch: BAPEN.
2. Bassey EJ (1986) *Ann Hum Biol* **13**, 499–502.
3. Hirani V & Mindell J (2008) *Age Ageing* **37**, 311–317.
4. Hirani V, Tabassum F, Maria Aresu, M. & Mindell, J (2010) *J Nut* **140**, 1475–1480.
5. Ruston, D. *et al*. (2004) National Diet and Nutrition Survey: Adults aged 19 to 64 years. London: The Stationery Office.