Overweight and Obesity among Older Adults on Admission to Hospital

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Abstract
Poor nutritional status, which includes both under- and over-nutrition, is associated with poor health outcomes. This cross-sectional study assessed the nutritional status of older patients admitted to an acute geriatric ward of a Dublin hospital. Anthropometric and clinical measurements were made. Thirty patients, mean (sd) age 79 (7) y and body mass index 26.6 (4.7) kg/m^2, participated. More patients were overweight (n=12) or obese (n=9) than underweight (n=1) or healthy weight (n=8) which indicates that this age-group may be part of the Irish obesity epidemic.

Introduction
Published definitions of poor nutritional status include both under- and over-nutrition[1]. In Ireland, 16%[2] to 84%[3] of older patients (>65y) were shown to be at risk of under-nutrition on admission to hospital and it is well known that under-nutrition is associated with increased susceptibility to infection and sepsis, increased risk of pressure sores, increased length of hospital stay[4] and increased hospital cost[5]. The prevalence of over-nutrition however, amongst the elderly on admission to hospital in Ireland is unclear. Over-nutrition is increasing in the older population[6] and is a risk factor for type II diabetes, cardiovascular disease and cancer. The aim of the current cross-sectional study was to assess the nutritional status of older patients on admission to an acute geriatric ward of a Dublin hospital.

Methods
The study was approved by the Medical Ethics Committee of Connolly Hospital, Blanchardstown, Dublin and all patients gave verbal consent. Patients were recruited consecutively and were considered eligible if they were e65y, not under the active care of a clinical nutritionist/dietitian, not on artificial nutrition support and not terminally ill. Demographic and clinical data were determined from medical notes. Actual weight was measured to the nearest 0.1kg using a chair scales (Seca 954 digital, Hamburg, Germany). Height was indirectly calculated using recumbent knee height measured using a knee-heel calliper (Chasmors, CMS Weighing Equipment Ltd, London, UK). Body mass index (BMI) was calculated and mid upper arm circumference (MUAC) was measured. Descriptive statistical analyses and independent t-tests or Mann Whitney U-tests were used and a P-value <0.05 was statistically significant.

Results
This 30 participant cohort consisted of 23 females with an overall mean (sd) age 79 (7)y and BMI 26.6 (4.7)kg/m^2. Nine patients were obese, (BMI e30kg/m^2), n=12 overweight (BMI 25-29.9kg/m^2), n=8 healthy weight (BMI 18.5-24.9kg/m^2) and one patient was underweight (BMI <18.5kg/m^2). Most BMI values fell between the 75th-95th and the 50th-75th centile ranges (n=7, n=6 respectively). Five patients had a MUAC >95th centile while n=2 were <5th centile. Good correlation was observed between MUAC and BMI (r=0.813, P<0.001). Patients were grouped according to Malnutrition Universal Screening Tool (MUST) MUAC cutoffs for estimating BMI. A MUAC <23.5cm indicates BMI<20kg/m†, a MUAC 23.5â 32cm indicates BMI 20-30kg/m† and a MUAC >32cm indicates BMI >30kg/m†. Cross-classification showed that 21 patients were classified correctly (Table 1). One patient classified as undernourished by BMI had a MUAC measurement which was considered healthy, while 3 patients classified as obese according to BMI had MUAC measurements <32cm.

MUAC: mid upper arm circumference; BMI: body mass index; MUST: Malnutrition Universal Screening Tool

Discussion
A greater number of older patients were classified as overweight and obese than underweight on admission to hospital. Whilst the current study suggests that this older population may be part of the current obesity epidemic, it is noteworthy that the current participants were hospital patients and that these data cannot necessarily be extrapolated to the general elderly population. The WHO states that in developed countries, weight and BMI gradually increase during adult life, peak at 50-59y and decline after 60y[7]. NHANES data in the US showed an increase in obesity prevalence from the early 1960s to 2000 from 11 to 36% in 60-70y old men and from 23 to 40% in women[8]. In Sweden, Eiben and colleagues6 showed that 20% male and 24% female 70y old subjects were obese, a 50% increase in men and more than a doubling in women over 3 decades. Irish data showed a similar trend. Charles and colleagues (1999)10 found the mean (sd) BMI was 19.2(3.7) kg/m^2 in elderly Irish hospital patients whilst in 2003, Corish and Kennedy[9] reported that two-thirds of elderly Irish free-living adults were classified as overweight or obese.

As with other studies, a significant correlation was found between MUAC and BMI. It was observed however that both underweight and overweight patients were misclassified by MUAC suggesting that the MUST recommended MUAC cut-offs may not be appropriate to determine BMI, although the authors acknowledge that the patient sample size in the current study was small. MUAC does not account for abdominal obesity and the measurement of waist circumference is a useful tool to estimate this. In conclusion, in the current study there were a greater number of older patients classified as over-weight than under-nourished on admission to hospital. This may reflect the increasing prevalence of over-nutrition in this population although extrapolation of these data to the general population must be carried out with caution.

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