Intensive and Critical Care Nursing (2016) 35, 52—56

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/iccn

ORIGINAL ARTICLE

Prevalence of obesity in an intensive care unit patient population

Diane M. Dennis [a,*], Michelle Trevenen [b]

[a] *Intensive Care Unit, Sir Charles Gairdner Hospital, Hospital Ave, Nedlands, Western Australia 6009, Australia*
[b] *University of Western Australia, Centre for Applied Statistics, Department of Research, Sir Charles Gairdner Hospital, Hospital Ave, Nedlands, Western Australia 6009, Australia*

Accepted 12 February 2016

KEYWORDS
Bariatric;
Body mass index;
Critical care;
Intensive care

Summary
Background: The Australian health survey (2011—2012) reported that 63.4% of Australian adults were overweight or obese. Critical care medicine is expensive, with intensive care unit (ICU) services accounting for a substantial proportion of total hospital costs. These costs may be multiplied in the overweight cohort.
Objectives: The primary aim was to compare the body mass index (BMI) of a critically ill ICU patient cohort to Australian population norms in order to see if overweight people were over-represented. The secondary aim was to identify if any medical specialty was associated with overweight patients.
Methods: A retrospective observational case note audit of 230 ICU patients between November 2012 and August 2013, with BMI as the primary outcome measure.
Results: Approximately 75% of the cohort were overweight or obese (median BMI 28.7; IQR 25.0—32.7) representing a rate 12% higher than Australian normative data. Based on population, this equates to an estimated additional 5279 unanticipated overweight or obese ICU patients at our facility during 2013.
Conclusions: This study has shown that Australian ICU patients may have higher BMI than those of the general Australian population, and therefore there may be unanticipated costs associated with their care. No medical specialty was associated with higher BMI than another.

* Corresponding author. Tel.: +61 8 93461010; fax: +61 8 93464440.
E-mail addresses: Diane.Dennis@health.wa.gov.au (D.M. Dennis), scgh-cas@uwa.edu.au (M. Trevenen).

http://dx.doi.org/10.1016/j.iccn.2016.02.002
0964-3397/

Implications for Clinical Practice

- Staffing ratios and equipment resources may need to be carefully allocated in the ICU setting in order to safely manage a relatively higher number of overweight or obese patients compared to that of the general population.
- Across-discipline training in the management of bariatric patients and supportive resources also needs to be in place in the ICU to support best safe practice.

Introduction

Obesity is considered a major public chronic health issue in many countries. Recent Organisation for Economic Co-operation and Development (OECD) data described the Australian obesity rate of 28.3% as the fifth highest in the world behind USA, Mexico, New Zealand and Hungary (Organisation for Economic Co-Operation and Development, 2015). It is a leading cause of mortality and disability, and there are serious cost implications both in terms of direct cost and the burden of disease cost (Finkelstein et al., 2009; Zizza et al., 2004). Obese individuals are at significantly higher risk of developing serious illnesses such as cardiovascular disease, high blood pressure and Type 2 diabetes (Sugerman, 2000). The Australian Bureau of Statistics Health Survey for 2011—2012 reported the prevalence of overweight (35%) and obesity (28%) in adults aged 18 years or above at 63.4% (Australian Bureau of Statistics, 2015b).

Critical care medicine is an expensive specialty, with intensive care unit (ICU) services accounting for a substantial proportion of hospital costs and resources (Moran et al., 2004; Williams et al., 2005; Williams and Leslie, 2004). Care requires substantial investment in personnel, space and equipment, and these costs may be multiplied in the overweight and obese cohort, where multiple factors impact upon critical illness (Charlebois and Wilmoth, 2004) and more staff and the modification of equipment may be required. Although there is much literature related to ICU outcomes in bariatric patients (Akinnusi et al., 2008; Anzueto et al., 2011; Hogue et al., 2009; Martino et al., 2011; Oliveros and Villamor, 2008) there is little about whether or not they are over-represented in the overall ICU population, and therefore whether ICUs may be under-resourced to manage these patients.

Methods

Objectives

The primary aim of this study was to compare the body mass index (BMI) of a critically ill ICU patient cohort to Australian population norms in order to see if overweight or obese people are over-represented within the ICU population. Our secondary aim was to identify if any medical specialty was associated with a more overweight or patient cohort.

Setting and ethical approval

This study was a retrospective observational case note audit of adult patients admitted to the Sir Charles Gairdner Hospital (SCGH), a 28-bed tertiary ICU between November 2012 and August 2013. It was approved by the SCGH Quality Improvement Committee (study number 4354) and exempt from Human Research Ethics Committee review based on negligible risk.

Participants

All ICU patients with recorded height and weight data were included, while those patients for whom no BMI data had been recorded were excluded.

Main outcome measures

The primary outcome measure was BMI, a simple index of weight and height that is used to classify underweight, overweight and obesity in adults according to World Health Organisation and Australian Department of Health guidelines (Australian Government Department of Health, 2009). Patients were classified as underweight (<18.5 kg/m^2), normal weight (18.5—24.99 kg/m^2), overweight (25—29.99 kg/m^2) or obese (30 kg/m^2 or above) (Australian Government Department of Health, 2009).

Factors such as age and muscle mass can influence the relationship between BMI and body fat, as BMI only takes into account excess weight. Although alternative measurements have been suggested such as waist and hip circumference that may be used to provide a ratio measure of body fat distribution correlating with disease risk (Australian Bureau of Statistics, 2015c), these measurements are not commonly taken or recorded in our ICU. Conversely, height is routinely measured by physiotherapists for ventilation purposes using a non-rigid disposable measuring tape along the whole length of the patient (head to toe). This method has been previously shown to be accurate and reliable (Dennis et al., 2015). Similarly, patient weight is measured and recorded in the patient's observation chart by nursing staff on admission as part of normal clinical practise.

Other demographic and clinical information were also collected in order to further define the cohort and to identify whether there was an association between BMI and these variables. These data included age, gender, acute physiology and chronic health evaluation (APACHE) II score (Knaus et al., 1985) and admission specialty. For patients readmitted to the ICU during this period only data from the first admission was included.

Statistical analysis

Summary statistics including means and standard deviations for continuous variables and counts and percentages for categorical variables were calculated. One-way ANOVAs were