Characteristics of psychiatric hospitalizations with multiple mechanical restraint episodes versus hospitalization with a single mechanical restraint episode

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ARTICLE INFO

ABSTRACT

We investigated the characteristics of multiple episodes of mechanical restraint versus a single episode in a psychiatric ward of a public general hospital. The following characteristics were associated with multiple restraints: young age, length of hospital stay, not being readmitted within 30 days from previous discharge, and admission in the previous year before the implementation of an intervention program to reduce mechanical restraint. The study suggests that both organizational factors and patients' disturbed behaviour are associated with the risk of being mechanically restrained several times.

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1. Introduction

Mechanical restraint is widely applied in international mental healthcare practice (Raboch et al., 2010), despite reported traumatic experience and psychological distress in patients (Frueh et al., 2005) and the risk of injury or even death. The prevalence of the use of restraint varies between 3.8% and 20% in different settings (Beghi et al., 2013). Several studies have indicated that organizational factors influence the use of coercive measures and could be potentially modifiable without side effects (Bak et al., 2012, 2014). In fact, efforts are being made to reduce mechanical restraint with specific interventions (Stewart et al., 2010) and also to implement legal restrictions and more restrictive guidelines (Di Lorenzo et al., 2014; Flammer and Steinert, 2015; Gonzalez-Torres et al., 2014; Guzman-Parra et al., 2015).

Yet, limited attention has been devoted to factors associated with multiple mechanical restraints in comparison with single applications of this measure. Different types of studies have found the following variables associated with multiple episodes of restraint: young age (Beck et al., 2008; Dumais et al., 2011; Hendryx et al., 2010; Knutzen et al., 2014), male gender (Beck et al., 2008),

previous hospital admissions (Knutzen et al., 2014), length of hospital stay (Beck et al., 2008; Dumais et al., 2011; Knutzen et al., 2014; Taylor et al., 2012), involuntary status of the admission (Beck et al., 2008; Korkeila et al., 2002), diagnosis of bipolar disorder (Dumais et al., 2011) and personality disorder (Beck et al., 2008; Dumais et al., 2011). However, the results of these studies are inconsistent, possibly due to different definitions of multiple restraints, and different settings and research methodologies. In addition, the small number of studies of patients who experienced multiple restraints and inconsistencies between them lead to a reduced clinical utility and generalization of results.

The aim of this study was to analyse the differences between hospitalizations with single and multiple restraint episodes in order to explore factors related to the latter.

2. Method

2.1. Setting

The study was conducted in the acute psychiatric ward of a public university general hospital of an urban area. The ward has 42 beds and it is the only adult psychiatric hospitalization facility in the public health system for a catchment area of approximately 500,000 inhabitants. The study population consisted of all hospital

admissions during the study period (between 01/01/2012 and 31/12/2014) in the unit (admissions, $n=2427$; patients, $n=1428$). The average stay of hospital admissions lasted 11.76 days ($SD=10.87$, range 1–127), 91.20% were involuntary admissions and 77.13% were urgent admissions. The total number of patients admitted during the 3 years was 1428, with a mean age of 43.33 years ($SD=13.24$); 57.35% of them were males. The total number of admissions with restraint was 210 (8.65%) and the number of patients restrained on at least one occasion during the study period was 174 (12.18%). There were no significant changes in staff ratio during the study period. In 2013 the unit carried out an intervention program for reducing mechanical restraint consisting of four strategies: 1) leadership and organizational changes, 2) registration and monitoring of episodes and risk patients, 3) nursing staff training in de-escalation techniques and prevention, and 4) involvement of patients in the treatment program (for more information see Guzman-Parra et al. (2016)).

2.2. Design and variables

The study design was a retrospective comparative analysis conducted over a period of three years (from January 2012 to December 2014). Restraint has been defined as any manual method or physical or mechanical device, material, or equipment that immobilizes or reduces the ability of a person to move his or her arms, legs, body, or head freely. The sociodemographic and clinical characteristics of restrained patients ($n=174$) and some variables related to their hospitalizations ($n=210$) were considered in order to compare single and multiple restraints. The following variables were extracted from the medical records of the hospitalization and the mechanical restraint registration: age, gender, nationality, marital status, the diagnosis performed by the psychiatrist, cumulative length of stay, length of hospital stay, admission within 30 days from previous discharge, status of admission (voluntary or involuntary), and the characteristics of the admission (either programmed by the referring psychiatrist or not programmed).

2.3. Ethical issues

This study was approved by the Ethics Committee of the hospital. Informed consent was not considered a requirement as the information used in the study was obtained retrospectively from mandatory administrative records for every episode of mechanical restraint and every admission in the ward. In addition, anonymity was guaranteed.

2.4. Statistical analysis

A bivariate and multivariate binary logistic regression analysis was performed using as a dependent variable the occurrence of multiple mechanical restraints or only one restraint during hospitalization and in patients during the study period. The statistical analyses were performed using SPSS (Version 15.0; SPSS Inc., 2006). The level of significance was set at 95% CI (2-sided).

3. Results

For patients with at least one mechanical restraint, the average age was 38.57 years ($SD=12.266$, range 18–72) and 71.3% were male. 2.59% of hospitalizations presented multiple mechanical restraints ($n=63$) during the study period. The average of mechanical restraint episodes in hospital admissions that presented multiple mechanical restraints was 2.73 ($SD=1.56$; range 2–11). There was a total of 319 episodes of mechanical restraint in the

period of the study and the reasons for the application of the measure were the following: violence or aggressive behaviour (81.82%; $n=261$), self-injury (17.24%; $n=55$), request from the patient himself/herself (2.82%; $n=9$) and others (37.62%; $n=120$). In 38.24% of the episodes there was more than one reason for restraint.

The results of the comparison between the characteristics of the patients and hospitalizations with multiple mechanical restraints and single restraint episodes during the study period appears in Table 1. With regard to sociodemographic and clinical variables of patients, there were significant differences in age ($OR=0.970$, $CI=0.944$–0.998, $p=0.033$) and the cumulative length of stay ($OR=1.013$, $CI=1.005$–1.021, $p=0.001$). Among the psychiatric diagnoses, psychotic spectrum disorders (F20–29) reduced the risk of being restrained several times when compared to those with a diagnosis of substance abuse or dependence (F10–19) ($OR=0.468$, $CI=0.195$–1.124, $p=0.089$), being the result marginally significant. With regard to hospitalizations, the following variables were significant: the year of admission (2013 vs. 2012, $OR=0.432$, $CI=0.203$–0.922, $p=0.030$; 2014 vs. 2012, $OR=0.454$, $CI=0.254$–1.010, $p=0.053$), the length of stay ($OR=1.036$, $CI=1.012$–1.061, $p=0.003$) and readmission within 30 days from previous discharge ($OR=0.170$, $CI=0.037$–0.787, $p=0.024$).

4. Discussion

The results of this study found significant differences in both characteristics and associated factors of patients and hospitalizations between multiple and single restraint groups.

Most existent research studies share common results and suggest that length of stay may be associated with the possibility of being more frequently restrained (Beck et al., 2008; Dumais et al., 2011; Knutzen et al., 2014; Taylor et al., 2012). It seems that patients who require a longer stay in hospital are likely to be severely ill and exhibit less controlled, more aggressive behaviour (Di Lorenzo et al., 2014; Wolff et al., 2015; Zhang et al., 2011), which, eventually, may result in implementing multiple mechanical restraints by the hospital staff. Young age has also been associated with the risk of being restrained several times (Beck et al., 2008; Dumais et al., 2011; Hendryx et al., 2010; Knutzen et al., 2014) and could be related to the difficulty in controlling aggressive and disturbed behaviour in the young population (Bowers, 2014). Among the different diagnoses, whose results, however, were not significant, personality and drug abuse related disorders were the most associated with multiple restraints. In short, as suggested by these results and other studies (Knutzen et al., 2014), the difficulty in controlling severely aggressive and disruptive behaviour is related to this practice and also to its repeated use.

The results of this study suggest that early readmission to the hospital (within 30 days from previous discharge) was a protective factor for multiple restraints. This could be related to the fact that hospital staff might be able to better identify high-risk patients and implement preventive strategies. Other factors could be that restraint is frequently used at the beginning of the stay and for behaviour exhibited by patients who are unknown in the ward (Gerace et al., 2013) and many early readmissions can be considered as a continuation of the previous admissions. However, this factor merits further research.

The year of admission was associated with multiple restraints and this could be attributed to the implementation of a specific program to reduce the use of mechanical restraint in the unit at the beginning of 2013. Some studies have demonstrated the effectiveness of interventions to reduce the use of multiple coercive measures in clinical settings (Maguire et al., 2012; Sclafani et al., 2008) and these results are in line with the present study. In