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Symptom burden and health-related quality of life among intensive care unit survivors in Argentina: A prospective cohort study☆,☆☆,★

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ABSTRACT

Purpose: Our goal was to describe the evolution of selected physical and psychologic symptoms and identify the determinants of health-related quality of life (HRQOL) after intensive care unit (ICU) discharge.
Methods: The study is a prospective cohort of consecutive adult patients admitted to a mixed ICU in a university-affiliated hospital, mechanically ventilated for more than 48 hours.
During ICU stay, epidemiological data and events probably associated to worsening outcomes were recorded. After discharge, patients were interviewed at 1, 3, 6, and 12 months. Health-related quality of life was assessed with EuroQoL Questionnaire–5 Dimensions, which includes the EQ-index and EQ–Visual Analogue Scale.
Results: One hundred twelve patients were followed up, aged 33 [24-49] years, 68% male, 76% previously healthy, and cranial trauma was the main diagnosis. Physical and psychologic symptoms and moderate/severe problems according to the EQ index progressively decreased after discharge, yet were still highly prevalent after 1 year. EQ index improved from 0.22 [0.01-0.69] to 0.52 [0.08-0.81], 0.66 [0.17-0.79], and 0.68 [0.26-0.86] ($P < .001$, for all vs month 1). EQ–Visual Analogue Scale remained stable, within acceptable values. Independent determinants of EQ-index were time, duration of mechanical ventilation, shock, weakness, and return to study/work.
Conclusions: Determinants of HRQOL after ICU discharge were both related to late sequelae of critical illness and to some events occurring in the ICU. Notwithstanding the high symptom burden, patients still perceived their HRQOL as good.

1. Introduction

Population aging, technological advances, and awareness of the benefits of critical care medicine have produced a yearly escalation of patients admitted to the intensive care unit (ICU) and surviving the experience [1]. Nevertheless, after discharge, patients and their families face a long, difficult time during which the physical, psychologic, and neurocognitive sequels become evident and greatly affect their quality of life. These adverse consequences of critical care were recently described as the post-intensive care syndrome [2], conditions that also involve nonmedical issues, such as economic and employment instability [3-6].

The impact of the burden of these diseases on health-related quality of life (HRQOL) has been studied in patients with acute respiratory distress syndrome (ARDS) [7,8] and in general populations of critically ill patients [9,10]. Information about these problems from Latin America is, however, scarce or nonexistent [11].

On these grounds, our goal was to evaluate the HRQOL and its independent determinants, in patients admitted to a medical-surgical ICU in Argentina at 1, 3, 6, and 12 months after discharge. Secondary objectives were to describe the prevalence and evolution of physical and psychologic problems.

2. Methods

This study was conducted in a 14-bed ICU located in a university-affiliated hospital, between May 1, 2010, and July 1, 2012. We included

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- Das Neves AV, Vasquez DN, Intile D, Moreira J, Loudet C, Sáenz MG, et al: Quality of life in critical illness survivors in Argentina. Evaluation with Euroqol 5D: a prospective cohort study. Am J Respir Crit Care Med 2012;185:A2288.
- Das Neves AV, Vasquez DN, Loudet C, Moreira J, Intile D, Sáenz MG, et al: Lack of awareness of severity of illness is a common factor after ICU. Intensive Care Med 2013;39: Suppl2;170. A663.

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consecutive patients 15 years or older who stayed more than 48 hours on mechanical ventilation (MV), except for those who refused to participate, were prisoners, or mentally disabled. Readmissions during the study protocol were considered for follow-up only after the first admission.

We recorded age, sex, severity of acute illness and of underlying diseases (Acute Physiology and Chronic Health Evaluation II and Charlson scores, respectively), diagnosis, category of ICU admission (medical, unscheduled/scheduled surgery, and trauma), organ failures (SOFA [Sequential Organ Failure Assessment] score), admission Glasgow score, hospital mortality, duration of MV and ICU, and hospital length of stay. We also registered events and conditions potentially associated to worsening long-term outcomes, such as ARDS, shock (defined as vasopressor requirement), acute kidney injury (defined as the duplication of serum creatinine or a urine output <0.5 mL/kg per hour during 12 hours) [12], Glasgow score, requirement of decompressive craniectomy and, at discharge, Glasgow score, anemia, tracheostomy, jejunostomy/gastrostomy, dysphagia (defined as any abnormality in swallowing as detected by "video deglutition" examination, which was performed in all patients) and "urinary incontinence" (defined as the unintentional loss of urine).

Follow-up protocol: before ICU discharge, patients or next of kin signed written consent forms agreeing to participate in the study, which consisted of 4 face-to-face or telephone interviews with either the patients or a relative, 1, 3, 6, and 12 months after hospital discharge. At 1 month, they were invited to a personal interview at a specially designed ICU office. Should the patient not come, he/she was subsequently contacted by up to 3 phone calls. In the latter case, we conducted telephone interviews with the patient or, if unavailable/unable to respond, with the next of kin. The procedure was repeated at each of the prescheduled visits. All interviews were performed by the same 3 researchers (ADN, DNV, and MGS).

At each interview, patients were asked about symptoms defined as relevant by the Guidelines of Rehabilitation after Critical Illness of the National Institute for Health and Clinical Excellence (United Kingdom) [6], also if they were receiving any kind of rehabilitation, and if they had returned to their previous activities. A clinical examination was conducted. In addition, the following questionnaires were completed:

- Health-related quality of life was assessed with the EuroQoL Questionnaire–5 Dimensions (EuroQol-5D) Quality of Life [13], a standardized instrument that measures health status in 5 dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. For each of these conditions, the possible answers are level 1, no problems; level 2, some/moderate problems; and level 3, severe/extreme problems [14]. The different weights of the 5 dimensions are summarized in the EQ-index as an estimated number from −0.005 to 1, which reflects the global health state. Negative values describe a health status perceived as worse than death.
  The EQ-index was considered the main outcome variable.
- The EuroQol-5D also includes the EQ–Visual Analogue Scale (EQ-VAS), a standard vertical 20-cm visual analogue scale similar to a thermometer, in which patients record their global health status [14]. The end points are labeled "best imaginable health state" and "worst imaginable health state (100-0 points, respectively)." This information is considered a quantitative, self-reported measure of health. We used the Argentinian validation of the EuroQol-5D [13].
- Davidson Trauma Scale, which assesses the risk of posttraumatic stress disorder (PTSD). A cutoff point greater than or equal to 40 suggests its diagnosis [15,16].
  To further evaluate physical functioning, a 6-minute walk test was performed [17].

Statistical analysis: descriptive statistics used were means ± SD, medians and interquartile ranges (IQR, 0.25-0.75) for continuous variables, and percentages for categorical data. After testing for normality, values at the different time points were compared with month 1, with *t* test for paired measurements or Wilcoxon signed rank test for continuous data and McNemar test for categorical data. A *P* value < .05 was considered as significant.

We performed a longitudinal analysis to evaluate the effect of time in the EQ-index, our main outcome measure for HRQOL, and to adjust for important covariates. We fitted our data to a marginal model by means of generalized estimating equations because EQ-index exhibited a nonparametric distribution [18]. Generalized estimating equation method was used to account for correlations between repeated measurements within subjects over time. An unstructured correlation matrix was selected. Variables that presented a *P* value < .10 were entered into a multivariate analysis to generate a best model with predictive factors.

Sample size was estimated according to EQ-index, the main outcome measure, for observational studies. We selected a mean value of 0.59, which represents 2 SD below the expected value of 0.91 ± 0.16, for subjects between ages 35 and 44 years [14,19], including the mean of value of patients' age in the ICU (43 ± 17 years) [20]. For a desired total width of the interval of 0.06, we calculated the standardized width for a 95% confidence level, which determined a sample size of 97 subjects [21]. We anticipated a 15% of dropouts, so the sample size was increased to 112 patients.

All analyses were performed with STATA 11 software (Stata Corporation, College Station, TX).

The Institutional Review Board of the Hospital San Martin de La Plata approved this protocol (no. 20091130TI).

3. Results

Of the 208 eligible patients (MV >48 hours), 86 died in the ICU, 10 fulfilled exclusion criteria, 112 were followed up over time, and 57 (51%) finished the study (Fig. 1). In the 249 interviews, 68% (169/249) of the questionnaires were answered face to face, 22% (56/248) by

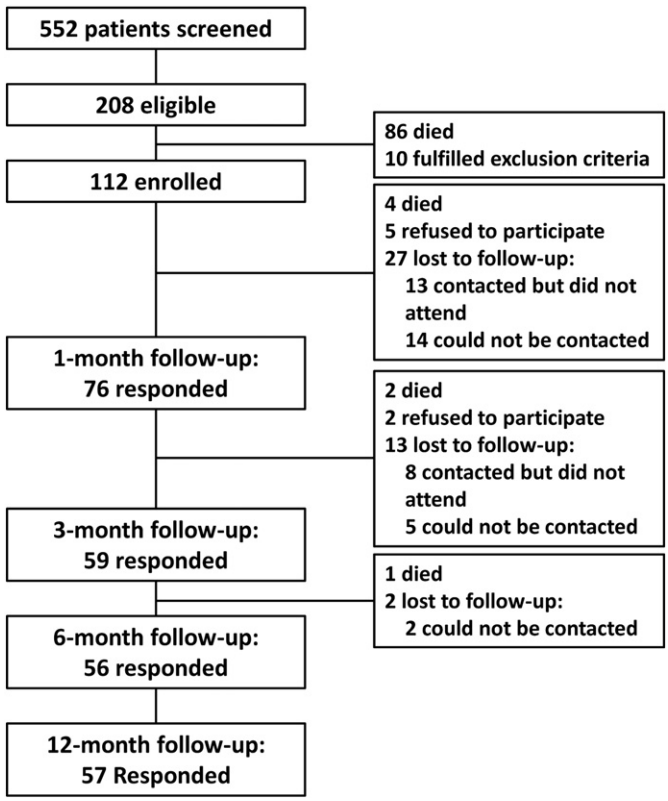

Fig. 1. Flow-chart of the study.