Critical Care in Older People in Low and Middle-Countries (LMICs): Comprehensive Geriatric Assessment (CGA) Protocol in Andes Mountains

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ABSTRACT

Background: The number of older adults in ICU care is increasing. Nowadays, at least fifty percent of ICU patients are aged 65 years and older. The most frequent pathologies to be admitted to the ICU in older people include acute diseases, long-term conditions, and acute or chronic disease exacerbations. Furthermore, new clinical phenotypes, and geriatric syndromes (falls, frailty, immobility) result from the interaction of age-associated conditions and comorbidity. Severity of index disease, multimorbidity, premorbid functional status, frailty, nutritional status, and cognitive level are more important determinants of long-term outcome than chronological age. Comprehensive geriatric assessment (CGA) is a recognized and useful instrument in the management of elderly patients.

Methods: We present a protocol for a clinical trial on the application of CGA in ICU in the Andes Mountains in Colombia, a Low and Middle-Income Country (LMIC). This protocol could provide valuable information for the integration of geriatrics into critical care and provide practical information on how to implement CGA in this context.

Results: The selection criteria of the tools to be used during the assessment of the patients were based on the available literature review and on reviews about interdisciplinary team interventions in acute care services based on the CGA.

Conclusion: The care of critically ill elderly patients in the ICU is challenging due to factors such as frailty, psychosocial vulnerability, cognitive impairment, dependence on activities of daily living, and the presence of geriatric syndromes which are important conditions for adverse health outcomes in the future. CGA technology could be considered an excellent tool for managing older people in ICU.

Keywords: Clinical trial, Comprehensive Geriatric Assessment, Intensive care unit, Older patient.

1. Introduction

Intensive Care Unit (ICU) is a well-organized system with trained care providers to offer essential support and monitor critically ill patients. Admission of older adult patients to the ICU is an increasing phenomenon. In Europe and the USA, for example, up to 52% and 55% of ICU patients respectively are over 65 years old [1]. In Low- and Middle-Income Countries (LMICs), the percentage varies between 38% and 44% [1]. Among them, up to 15% are over 80 years old [2]. However, the complicated environment of the ICU [1] is a hostile setting for the care of the elderly, especially if they are frail.

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conditions, and acute or chronic disease exacerbations [3]. Furthermore, the interaction of age-related conditions and multimorbidity results in new clinical phenotypes, and geriatric syndromes, such as falls, frailty, and immobility [3].

Previously, the severity of the index condition and age were the most important predictors of ICU mortality. However, in older adults, additional factors need to be considered. These include multimorbidity and premorbid functionality. Presence of frailty, nutrition status, and cognitive level are more relevant predictors of mortality and functional outcomes than chronological age [2]. Older people are more at risk of dying when being admitted to the ICU, which is a situation that does not depend so much on chronological age but more on the biological one [2].

Among the risk factors for mortality in the older people within the ICU we have: age, underlying diagnosis, severity of the acute disease, multiorgan failure, surgical vs. non-surgical diagnosis, chronic comorbidities, pre-morbid functional status, and frailty vs. non-frailty status, among others [3]; these events are much more common especially in very old patients, and they should be addressed and managed from the Comprehensive Geriatric Assessment perspective (CGA). The CGA is an interdisciplinary approach that focuses on medical, psychological, cognitive, functional, and social aspects. It takes a diagnostic approach to address medical, functional, and psychosocial problems to provide a coordinated, integrated, and personalized care plan to improve the wellbeing of the elderly [5].

In the last two decades, other characteristics from the CGA have been recognized as important risk factors for outcomes in older people [3]. For instance, frailty is recognized as a major determinant of mortality, hospitalization, and functional outcomes in geriatric patients [6]. Poor baseline functional status has been associated with negative outcomes in older people [7]. In a recent study about functional status in older intensive care unit survivors, the survival group had a significantly higher baseline functional score at the ICU and at hospital discharge [8]. Nevertheless, we need to establish a standardized protocol to assess older people in the ICU. This allows for better knowledge and evidence for admission criteria, intervention strategies, and follow-up of older people in ICU settings in LMICs [9].

This study aims to describe the characteristics of hospitalized elderly people at the medical and surgical ICU ward by using a protocol based on the CGA, which includes the socioeconomic, physical health, mental health, and functional status domains, aside from factors related to the hospital stay, such as admission diagnoses, severity, laboratory results, medication use, invasive interventions, mechanical ventilation, complications, and duration of the stay, which are related to the main adverse consequences, including mortality.

2. Methods

2.1. Study Design

This clinical trial protocol is a longitudinal, prospective, and observational study. People over 60 years old admitted to the surgical and medical ICU ward of a tertiary teaching hospital in Manizales, located in the Colombian Andes Mountains region, will be assessed.

2.2. Sample Collected

The flowchart of the research protocol is shown in Fig. 1. Patients in whom the medical team foresaw an ICU stay longer than 24 hours were included. Patients admitted for organ donation, in postoperative states of non-cardiac surgery extubated in the first 12 hours of ICU stay or patients who do not sign the informed consent form will be excluded. The hospital length of stay, duration of organ support, withdrawal of care decision, in-hospital mortality, site of discharge, and functional capacity 30 and 90 days after discharge will be collected data.

2.3. Ethical Approval

This study was approved by the local ethics committees of the University of Caldas and the Hospital General Santa Sofía. Informed written consent was obtained through a consent form given to the participants or their proxy along with the questionnaire.

2.4. Data Analysis

The normality of quantitative variables will be analyzed using the Kolmogorov-Smirnov test. Continuous variables will be presented as mean and standard deviations (SD). The chi-squared test ($\chi^2$) will be used to compare discrete variables. When the expected value is less than 5 in one of the squares of the contingency table, Fisher’s exact test will be used. Categorical variables will be presented as absolute and relative frequencies (percentages), with chi-square or Fisher’s exact tests for comparisons, as appropriate. The Kaplan-Meier analysis with log-rank test will be performed to compare the differences in mean survival time. The data will be analyzed using SPSS v.22 software (Chicago, IL). A $p$-value of $< 0.05$ will be considered significant.

3. Results

A preliminary search has been conducted. The protocol will be applied within 24 hours of ICU admission. Six domains of the CGA will be assessed, including functional capacity, cognition, delirium, comorbidity, frailty, and nutrition [10]. The selection criteria of the tools to be used during the assessment of the patients were based on the available literature review [11]–[13] and on a recent scoping review about interdisciplinary team interventions in non-ICU acute care services based on the CGA [10]. Moreover, domains for assessing older people in the ICU in LMICs have been previously proposed [12].

In the physical health domain, the Clinical Frailty scale (CFS) is included [14], which has been broadly used in the ICU. A recent study reported that frailty assessment using the CFS could predict short-term mortality in older adult patients admitted to the ICU [15]. Likewise, multimorbidity will be assessed with the Cumulative Illness Rating Scale-Geriatric (CIRS-G) [16]. This tool has been associated with mortality one year later [17]. The NUTRIC score (Nutrition Risk in the Critically Ill Score) [18] has

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been proposed to assess the risk of adverse events that are potentially modifiable through nutritional intervention in critically ill patients [19]. As recommended by the Global Leadership Initiative on Malnutrition (GLIM), a two-step approach for the malnutrition diagnosis was selected: first screening to identify the “at risk” status using any validated screening tool; in this case, the NUTRIC score was selected; and second, an assessment to diagnose and grade the severity of the malnutrition [20].

In the domain of functional capacity, we included self-care and survival activities that depend on neurological development and make the survival of the individual possible [21]. The Katz index to evaluate the Activities of Daily Living (ADL) at a basic level has been implemented in assessment protocols in older people who are admitted to the ICU [22] due to being shorter and more practical to apply in the scenarios where there is not much time to apply scales.

In the mental health domain, we will initially apply the Glasgow scale [23] to identify neurological dysfunction and to follow up on the progress of the level of consciousness, to predict the prognosis, and to standardize communication among health professionals. Given the importance of cognitive evaluation in assessing older adult patients with acute pathologies, we will use the Informant Questionnaire on Cognitive Decline in the Elderly (IQ-CODE), widely used in researching older people’s critical care [12]. This tool has the potential to predict outcomes and to define the management of the patient [5]. Cognitive impairment and dementia have been associated with higher mortality in hospitalized older people [24]. Another factor considered an important determinant of outcomes in older adults in the ICU is delirium [15], which is a predictor of mortality in frail elderly critical care ill [25]. In this study, we will use the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU), globally used in geriatric research in the ICU [26].

Within the first 24 hours of ICU admission, acute severity parameters allow calculation of SOFA (Sepsis-related Organ Failure Assessment) and SAPS II (Simplified Acute Physiology Score II) scores [27], [28], and the index diagnosis (selected in a pre-defined list of ICU diagnoses) will be collected. The main consequence to be measured will be mortality [2], [29] and other related ones like functional status and the presence of geriatric conditions [8], [12], [30].

The pilot study will be in the summer of 2023. We will follow the guide to the SPIRIT statement for defining standard protocol items for clinical trials [31] and the reporting of protocols of pilot and feasibility trials [32].

3.1. Preliminary Findings

Most of the tools in the CGA included in the assessment of older people in the ICU are selected based on theoretical approaches taken from other clinical media or other pathologies [10]. However, the CGA emphasizes clinical problem-solving incorporating standard medical assessment, providing tools to develop treatment plans and follow-up plans, coordinating the management of care, and evaluating long-term care needs. Developing a CGA protocol will make creating an adequate model to manage older adult patients with complex situations in the ICU possible. Another finding when developing this protocol was the gradual importance that geriatric syndromes have reached, especially frailty, in evaluating older people in the ICU [4]. The elderly in ICU pose unique challenges in their management, not only because of advanced chronological age but also because of the presence of geriatric syndromes and conditions such as physical dependence, cognitive impairment, polypharmacy, frailty, social vulnerability, and others, and are important conditions for adverse health outcomes in the future [33].

3.2. Limitations

The proposed research protocol has some limitations. First, the results and outcomes of all groups after admission to the ICU are not often reported, most probably because this is a difficult area to conduct research [2]. The difficulties inherent to the ICU in recruiting and assessing patients pose limitations in external validity, leading to criticism of the design of randomized clinical trials in these contexts [10]. Consequently, this pilot will allow us to evaluate how the main study works through the research of reliability, the study process, the necessary resources, the methods, and the potential obstacles.
to completion [32]. Additionally, the search terms, the study selection, and the scales applied for multidimensional assessment emerged from the literature review in areas such as emergency care, geriatric acute care units, and anesthesiology, synthesizing studies with heterogeneous populations and methodologies. Although some of these scales are validated in critical care, this could represent a bias to be considered in the discussion of the findings. Nevertheless, the information was synthesized and analyzed descriptively and thematically. Furthermore, this protocol synthesizes evidence from publications and research using heterogeneous methodologies. This will limit the possibility of being comparable and drawing generalizations from its findings.

Currently, there are not enough studies to evaluate the efficacy of the CGA in old patients admitted to an ICU [10]. Although, in daily clinical practice, the predictive capacity of adverse outcomes is the main interest in using rating scales, some tools that are part of the CGA have not been adequately evaluated in the ICU in terms of their predictive capacity in this context.

4. Conclusion

Our research will identify where further evidence is needed to support the development and application of the CGA in older people in the ICU. Researchers, clinicians, and implementation teams could use the research findings, as they have the appropriate setup for CGA assessment and evaluating its efficacy. The need for future research contributions and implementation of research findings will be identified.

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Conflict of Interest

Authors declare that they do not have any conflict of interest.

References


