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Impact of functional capacity in mortality six months after high elderly in ICU

Impacto da capacidade funcional na mortalidade seis meses após alta em idosos internados em UTI

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RESUMO | INTRODUÇÃO: O envelhecimento é um processo natural de redução progressiva da reserva funcional dos indivíduos e o fator que determina saúde dos idosos é a independência nas suas atividades habituais, que consiste em sua funcionalidade e quando acometidos por alguma enfermidade tendem a ter uma recuperação mais lenta, em comparação aos pacientes jovens, devido ao declínio funcional inerente ao processo de senescência, o que pode resultar em maior risco de morte. **OBJETIVO:** Avaliar o impacto da capacidade funcional na mortalidade de idosos após seis meses de alta da Unidade de Terapia Intensiva. **METODOLOGIA:** Trata-se de um estudo de coorte, ambispectivo, realizado em uma Unidade de Terapia Intensiva de um hospital público de grande porte, localizado na cidade de Salvador, Bahia em 2018. A amostra foi composta por pacientes idosos admitidos na UTI, com idade igual ou superior a 60 anos, onde foram aplicadas as Escalas de Mobilidade em UTI (EMU) e Estado Funcional (FSS) para avaliar a capacidade funcional no dia da alta da UTI e através de contato telefônico, foi observado a ocorrência de óbito após 6 meses da alta. Foram excluídos pacientes com instabilidade hemodinâmica, desordens cognitivas. e aqueles onde houve impossibilidade de contato telefônico. Para análise estatística dos dados de variáveis contínuas foram avaliados com medidas de tendência central e dispersão, variáveis categóricas avaliadas com medidas de frequência e para relacionar a capacidade funcional e mortalidade foi utilizado o teste não paramétrico de Mann-Whitney com o uso do software SPSS. **RESULTADOS:** A amostra foi composta por 30 pacientes, sendo a maior parte composta por indivíduos do sexo masculino (60,0%), com média de idade 68,0(±6,7) anos, com perfil diagnóstico predominantemente clínico (70,0%), média de tempo de internamento de 3,2 (±1,8) dias, capacidade funcional aferida pela escala do estado funcional (FSS) da alta de 29,3(±8,5) e pela escala de mobilidade em UTI (EMU) da alta de 8,8 (± 2,6). Dos pacientes inicialmente avaliados, 08 (21,1%) foram excluídos por impossibilidade de contato por telefônico após a alta, tendo completado o estudo com 30 pacientes, destes 11 (28,9%), evoluíram a óbito em até seis meses após a alta da UTI. Um dado que chama atenção é a taxa de mortalidade nos pacientes estudados, que chegou a 36,6% **CONCLUSÃO:** O status funcional, de pacientes idosos, no momento da alta da UTI está relacionado com uma maior taxa de mortalidade em seis meses após a alta da unidade de terapia intensiva.

PALAVRAS-CHAVE: Unidades de Terapia Intensiva. Mortalidade. Fisioterapia.

ABSTRACT | INTRODUCTION: Aging is a natural process of progressive reduction of the functional reserve of individuals and the factor that determines health of the elderly is the independence in their usual activities, which consists of their functionality and when affected by some disease tend to have a slower recovery , compared to young patients, due to the functional decline inherent in the senescence process, which may result in an increased risk of death. **OBJECTIVE:** To evaluate the impact of functional capacity on the mortality of the elderly after six months of discharge from the Intensive Care Unit. **METHODOLOGY:** This is an ambispective cohort study performed in an Intensive Care Unit of a large public hospital, located in the city of Salvador, Bahia, Brazil in 2018. The sample consisted of elderly patients admitted to the ICU with age equal to or greater than 60 years, where the ICU Mobility Scales and Functional State Scale (FSS) were used to assess functional capacity on the day of ICU discharge and through telephone contact, the occurrence of death after 6 months of discharge. Patients with hemodynamic instability, cognitive disorder and those who did not have telephone contact were excluded. Statistical analysis of the continuous variables data were evaluated with measures of central tendency and dispersion, categorical variables evaluated with frequency measures and to relate the functional capacity and mortality was used the non-parametric Mann-Whitney test with the use of SPSS software. **RESULTS:** The sample consisted of 30 patients, most of them male patients (60.0%), with a mean age of 68.0 (± 6.7 years), with a predominantly clinical diagnostic profile (70, 0%), mean hospitalization time of 3.2 (± 1.8) days, functional capacity measured by the functional status scale (FSS) of the discharge of 29.3 (± 8.5) and the mobility scale in ICU discharge of 8.8 (± 2.6). Of the patients initially evaluated, 08 (21.1%) were excluded due to the impossibility of contact by telephone after discharge, having completed the study with 30 patients, of these 11 (28.9%), died within six months after discharge from the ICU. **CONCLUSION:** The functional status of elderly patients at discharge from the ICU is related to a higher mortality rate in six months after surgery. discharge from the intensive care unit.

KEYWORDS: Intensive Care Unit. Mortality. Physiotherapy

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Introduction

The decrease in fertility rate, associated with a lower mortality rate, is contributing to the phenomenon of population aging[11]. It is estimated that between 1970 and 2025 there will be an increase of more than 200% in the world's elderly population. Population aging is a major breakthrough for humanity and a major challenge with regard to health policies that address and address the needs of this population[2].

Aging is a natural process of progressive reduction of the functional reserve of individuals[1]. The health of the individual is defined not only by the absence of disease or by physical integrity. The factor that determines health in old age is independence in its usual activities, which consists of its functionality. An elderly person is considered to be healthy when they do not need help or supervision to carry out their day to day tasks, even if they have one or more diseases[3].

For the elderly population a period of hospitalization may present several risks, mainly because this population is more susceptible to complications that may affect its functional capacity, it is considered an important marker of health in the elderly[4]. Immobility in the bed can cause complications such as changes in muscle strength with a reduction of 1.3% to 3% per day in healthy individuals, and development of abnormalities of the neuromyoarticular system, which may lead to changes in functional capacity at hospital discharge[5].

Functional decline, caused by these negative effects, may predict a worse prognosis for patients 6,7. Therefore, it is necessary to evaluate and monitor the functional capacity of ICU patients through instruments validated for this purpose. The Mobility Scale in ICU was developed by Hodgson et al in 2014 and evaluates the functional capacity through the level of mobility, has a high level of reliability, and quick and easy application 8, different from the International Classification of Functioning (ICF), which is a complex instrument and difficult to apply in clinical practice 9. The Functional State Scale (FSS) has good reliability and is easy to apply, was created by Zanni and collaborators in 2010[10].

In the literature there are still gaps to be filled about functional capacity of the elderly and their impact on mortality. Therefore, according to the above, this study aims to evaluate the relationship between the functional capacity at the time of discharge of the Intensive Care Unit (ICU) in the mortality of the elderly after six months of discharge.

Methods

This is an ambispective cohort study, approved by the CEP under the number of CAAE 59587416.0.0000.5028 and approval opinion No. 2.382.343. The research was carried out in an Intensive Care Unit of a large hospital, located in the city of Salvador, Bahia, from October 2017 to December 2018.

The sample consisted of elderly patients admitted to the ICU, aged 60 years or older. Patients were excluded from cognitive disorder, such as aphasia, delirium, disorientation, mutism, dementia, hemodynamic and clinical instability, and those where there was no telephone contact. During the internment, the procedures for evaluating and collecting the data in medical charts and on the discharge from the ICU were started. The scales were applied: ICU Mobility scale and Functional Status Scale (FSS) to evaluate functional capacity. In this study, mortality was evaluated after 6 months of discharge from the ICU, through telephone contact conducted by the researchers, in which the patient's relative / caregiver was questioned about the patient's current health status.

Statistic

For statistical analysis of demographic and clinical data, descriptive statistics were used. The data of continuous variables were evaluated with measures of central tendency and dispersion and expressed as means and standard deviation for the varieves with symmetric and median distribution and interquartile range in cases where the distribution of the data is asymmetric. Data of dichotomous variables or categorical variables were evaluated with frequency

measures and expressed as percentages using the SPSS (Statistical Package for the Social Sciences) for Windows software (version 22.0). The confidence level adopted was 95%, with a value of p = 0.05 to obtain statistical significance. The non-parametric Mann-Whitney test for independent samples was used to measure the effect of exposure of the explanatory variables on the primary outcome, after analysis of the normality of the data.

Results

The sample consisted initially of 38 patients, most of them male patients, aged between 60 and 87 years, with a predominantly clinical diagnosis profile and hospitalization time between 1 and 8 days, as can be seen in Table 1. And the mortality rate in the patients studied was 36.6%. Of the patients included in the study, 08 (21.1%) were excluded from the study because we did not reach them by telephone during the post-discharge data collection phase, and 30 patients completed the study, 11 (28, 9%) had the death outcome within six months after discharge from the ICU.

When comparing the functional capacity at ICU discharge with the outcome after six months of ICU discharge, using the FSS scales and the ICU mobility scale in both, it was possible to find statistical significance (p = 0.002 and p <0.001, respectively) Regarding the relationship between the functional status of discharge and mortality after six months of ICU discharge, those who had a worse functional status had the highest death outcome, as can be seen in Table 2.

It was also evaluated whether ICU stay was related to the outcome after six months of discharge, but there was no statistically significant difference between the groups (p = 0.157). (Table 3)

Table 1. Socio-demographic characteristics of elderly patients admitted to the ICU in the city of Salvador-Ba, 2017. (n = 30)

Variables	Average (±SD)	N(%)
Age (years)	68,0 (±6,7)	
Length of stay (days)	3,2 (±1,8)	
Sex		
male		18(60,0%)
Female		12(40%)
Admission profile		
Clínical		21(70,0%)
surgical		09 (30,0%)
Functional Classification		
FSS discharge from hospital	29,3 (±8,5)	
ICU Mobility Scale discharge from hospital	8,8 (± 2,6)	
Outcome after six months of discharge		
Alive		19 (63,3$%)
Death		11 (36,6%)

SD= standard deviation; FSS= Functional Status Score for the ICU; ICU= intensive care unit.

Table 2. Functional status x Mortality of elderly patients admitted to an ICU in Salvador, Ba, between 2017 and 2018

Evaluation Tool	outcome	Median/IR	p*
FSS discharge from hospital	Vivo Óbito	35,0(30,5-35,0) 25,0(19,5-30,0)	0,002
ICU Mobility Scale discharge from hospital	Vivo Óbito	10,0 (8,5-10) 7,0 (3,5-8,0)	<0,001

* Mann-Whitney test; IR = Interquartile range; FSS= Functional Status Score for the ICU; ICU= intensive care unit.

Table 3. Length of stay in the ICU x Mortality in the elderly hospitalized in a ICU of Salvador-Ba, between the years of 2017 and 2018

Outcome	Median/IR	p*
Alive Dead	3,0(2,0-4,0) 4,0(3,0-4,75)	0,157

*Mann-Whitney test; IR = Interquartile range.

Discussion

In the present study, which aimed to analyze the impact of functional capacity on the mortality of the elderly 6 months after discharge from the ICU, an association between a worse functional capacity and mortality after six months of discharge was observed.

Visnjevac et al., 2014 conducted a study with 1049 octagenic patients undergoing some surgical procedure, with the objective of analyzing the correlation between functional status and post-discharge mortality. In this study, the patients were divided into two groups: one of functionally independent patients and the other of partially or totally dependent patients, and the self-reported functional capacity evaluation in the preoperative period. The 30-day mortality rate was higher in the functional dependent group (p <0.001). Although the profile of the population is different from that of our study, where we studied a profile with a higher frequency of clinical patients and the time used to evaluate the outcome was lower than that used in the present study, which was 6 months after discharge of the ICU, the results are in agreement with the association found in our study between lower functional capacity and mortality[11].

The study by Leistner et al., 2018 with 616 elderly over 80 years undergoing percutaneous coronary intervention with the objective of evaluating functional capacity and mortality after hospital discharge. The functional capacity of the patients was evaluated through Barthel's index (BI), and 178 (29%) of the patients were classified as low BI, 128 intermediate BI, and 310 with high BI[12].

The 30-day mortality rate was 5%, 4% and 1% in the low, intermediate and high BI groups respectively (p = 0.09), and in one year of follow-up the low BI mortality was 10% Intermediate BI was 13% and 5% in the high IB. These results, which compare functional capacity with post-discharge mortality, corroborate with the findings of our study, where it was observed that patients with lower functional capacity died more than six months after discharge, but the studies differed in the evaluation instruments, since BI evaluates the activities of daily living (ADLs) and measures the functional independence in personal care, mobility, locomotion and eliminations, and the instruments used in our study are the Functional State Scale in ICU (FSS-ICU) that affects the physical function of patients hospitalized in the ICU, through performance evaluation in tasks that include rolling, transferring from the supine position to sitting, transferring from sitting to standing, sitting at the bedside and walking, and the ICU Mobility Scale which aims to objectively measure the mobility of patients hospitalized in the ICU, where the score ranges from 0 to 10, in a single domain, and the score zero expresses a low mobility (interpreted as the patient who only performs passive exercises in the bed) and the score 10 expresses a high mobility (interpreted as the patient who presents independent ambulation without help)[12].

Corroborating with these data, Cabral et al., 2009 studied 380 elderly patients hospitalized at an ICU, with the objective of analyzing mortality and quality of life at 2 years of follow-up. At the end of follow-up, 95 patients had died, totaling a 25% mortality rate. These data present a high mortality rate when compared to other patient profiles13 , and although the outcomes evaluated were different, the mortality rate of our study was also high (36.6%).

Pourabbas et al.[14], 2017, with young patients, under 60 years old, post-surgery for correction of hip fracture, included 201 individuals with the objective of prospectively assessing mortality at 1 year after hospital discharge, had a mortality rate of 3.4 % after one year of follow-up, this result, which differs from the result found in our study, which had a mortality rate of 28.9%, this discrepancy can be justified by the difference in the population profile, since the population studied in our research was a population of elderly patients who tend to have a slower recovery compared to young patients due to the functional decline inherent in the senescence process.

The small number of participants, besides the absence of the use of a score to measure the severity of these patients, are limitations of the present study.

Conclusion

According to the results found in our study, we concluded the functional status of elderly patients at ICU discharge is related to a higher mortality rate at six months after discharge from the intensive care unit. These findings point to a greater care after discharge from the ICU in elderly patients with a lower degree of functional independence.

Author Contributions

Rocha JDN, Gaspar LC, Gomes YS, Santos MR, Santos GO and Anjos JLM participated in the conception, study design, data collection and statistical analysis, interpretation of the results and writing of the scientific paper.

Competing interests

No financial, legal or political competing interests with third parties (government, commercial, private foundation, etc.) were disclosed for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.).

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