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DECLÍNIO FUNCIONAL EM IDOSOS DURANTE A HOSPITALIZAÇÃO

FUNCTIONAL DECLINE IN ELDERLY DURING HOSPITALIZATION

DETERIORO FUNCIONAL EM ANCIANOS DURANTE LA HOSPITALIZACIÓN

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RESUMO

Introdução: A hospitalização e o repouso no leito, podem causar nos idosos um acentuado declínio funcional, independentemente da etiologia da doença aguda que determinou o internamento. Este é considerado um risco acrescido para esta faixa etária, pois pode afetar a funcionalidade e a qualidade de vida de forma irreversível. Este estudo tem como objetivos avaliar as alterações da capacidade funcional dos idosos durante o internamento e categorizar a variação ocorrida na capacidade funcional durante o internamento.

Metodologia: Estudo observacional descritivo realizado num serviço de internamento de Medicina interna numa amostra de 20 idosos, com recurso ao Índice de Barthel, à escala Short Physical Performance Battery (SPPB) e à Força de Preensão Palmar. Consideram-se dois momentos de avaliação: admissão e alta.

Resultados: Em todos os parâmetros avaliados foi encontrado um decréscimo dos valores entre a primeira e a segunda avaliação sendo esta diferença estatisticamente significativa no Índice Barthel ($p=0,006$), na SPPB 3 ($p=0,046$), no score total da SPPB ($p=0,05$) e na Força de Preensão Manual ($p=0,005$). A diferença encontrada no score total da SPPB, em que 50% da amostra foi categorizada com incapacidade ou desempenho muito mau, é também clinicamente importante.

Discussão: O valor médio encontrado no score total da SPPB na admissão indica risco relativo de incapacidade relacionada com a mobilidade. O valor médio encontrado no score total da SPPB na alta é descrito na literatura como indicador de alto risco de reinternamento ou morte.

Conclusão: Os resultados evidenciam a necessidade de intervenção especializada de Enfermagem de Reabilitação junto desta população específica durante o internamento. A avaliação inicial permitirá identificar o risco de perda funcional durante o internamento e desenhar planos de intervenção personalizados.

Descritores: Envelhecimento, Idoso com Deficiência Funcional, Hospitalização

ABSTRACT

Introduction: Hospitalization and bed rest can cause a marked functional decline in the elderly, regardless of the etiology of the acute disease that determined hospitalization. This is considered an increased risk for this age group, as it can affect functionality and quality of life irreversibly. This study aims to assess changes in the functional capacity of the elderly during hospitalization and to categorize the variation in functional capacity during hospitalization.

Methodology: Descriptive observational study carried out in an internal medicine inpatient service in a sample of 20 elderly people, using the Barthel Index, the Short Physical Performance Battery scale (SPPB) and the Handgrip strength. Two moments of evaluation were considered: admission and discharge.

Results: In all parameters evaluated, a decrease in values was found between the first and the second evaluation, this difference being statistically significant in the Barthel Index ($p=0,006$), in SPPB 3 ($p=0,046$), in the total score of the SPPB ($p=0,05$) and in the handgrip

strength ($p=0,005$). The difference found in the total score of the SPPB, in which 50% of the sample was categorized as incapacity or very poor performance, is also clinically important.

Discussion: The results show the need for specialized Rehabilitation Nursing intervention among this specific population during hospitalization. The initial assessment will make it possible to identify the risk of functional loss during hospitalization and to design personalized intervention plans.

Conclusion: The average value found in the total SPPB score at admission indicates a relative risk of disability related to mobility. The average value found in the total SPPB score at discharge is described in the literature as an indicator of high risk of readmission or death.

Descriptors: Aging, Functionally Impaired Elderly, Hospitalization

RESUMEN

Introducción: La hospitalización y el reposo en cama pueden causar una marcada disminución funcional en los ancianos, independientemente de la etiología de la enfermedad aguda que determinó la hospitalización. Esto se considera un mayor riesgo para este grupo de edad, ya que puede afectar la funcionalidad y la calidad de vida de manera irreversible. Este estudio tiene como objetivo evaluar los cambios en la capacidad funcional de los ancianos durante la hospitalización y clasificar la variación en la capacidad funcional durante la hospitalización.

Metodología: Estudio observacional descriptivo realizado en pacientes hospitalizados en un servicio de medicina interna para en una muestra de 20 personas mayores, utilizando el Índice Barthel, la escala de batería de rendimiento físico corto (SPPB) y la fuerza de agarre de Palmar. Se consideraran dos momentos de evaluación: admisión y alta.

Resultados: En todos los parámetros evaluados, se encontró una disminución en los valores entre la primera y la segunda evaluación, siendo esta diferencia estadísticamente significativa en el Índice Barthel ($p=0,006$), en SPPB 3 ($p=0,046$), en la puntuación total de la SPPB y en la fuerza de agarre manual ($p=0,005$). La diferencia encontrada en la puntuación total de la SPPB, en la que el 50% de la muestra se clasificó como incapacidad o muy bajo rendimiento, también es clínicamente importante.

Discusión: El valor promedio encontrado en el puntaje total de SPPB en la admisión indica un riesgo relativo de discapacidad relacionado con la movilidad. El valor promedio encontrado en el puntaje total de SPPB al momento del alta se describe en la literatura como un indicador de alto riesgo de readmisión o muerte.

Conclusión: Los resultados muestran la necesidad de una intervención especializada en enfermería de rehabilitación entre esta población específica durante la hospitalización. La evaluación inicial permitirá identificar el riesgo de pérdida funcional durante la hospitalización y diseñar planes de intervención personalizados.

Descriptor: Envejecimiento, Ancianos con deficiencias funcionales, Hospitalización

INTRODUCTION

Hospitalization of the elderly people, regardless of the reason, is often accompanied by several risks, including functional decline. Functional decline refers to the decrease and loss of ability to perform activities of daily living independently and is associated with physical and psychosocial complications⁽¹⁾.

Multiple factors can contribute to functional decline during hospitalization of the elderly. Prolonged immobility, resulting from bed rest and physical restrictions, can lead to loss of muscle mass (up to 5% per day), muscle strength and global mobility⁽²⁾. Other factors such as pain, fatigue and discomfort associated with the acute illness and hospitalization may limit the ability of the elderly people to perform physical activity⁽³⁾. Medication, particularly the type and number of drugs, also plays an important role, and may cause adverse side effects that compromise functionality⁽⁴⁾.

Functional decline during hospitalization has negative implications for the health and well-being of the elderly. The loss of functional independence is associated with an increase in hospitalization time, greater morbidity and clinical complications, readmissions and higher mortality⁽²⁾. In addition, functional decline can lead to psychosocial complications, such as depression, anxiety and decreased quality of life⁽⁵⁾. The scientific literature clearly demonstrates the relationship between the loss of functional capacity and institutionalization and the way in which they relate and enhance each other⁽⁶⁻⁸⁾.

Maintaining the function and physical activity of the elderly during hospitalization is crucial. The implementation of programs based on therapeutic exercises, early mobilization and balance training have shown significant benefits in preventing functional decline⁽⁵⁾. The intervention of the nurse specialist in Rehabilitation Nursing is fundamental in the evaluation of the elderly people and in the prescription of interventions that significantly contribute to minimize the impact of this phenomenon.

Therefore, it becomes evident the need for an evaluation that allows Specialist Nurses in Rehabilitation Nursing to characterize this phenomenon, and its magnitude, so that strategies aimed at preventive intervention can be implemented. This study is based on the research question "What is the impact of hospitalization on the functional capacity of elderly people admitted to an Internal Medicine service?" and aims to: evaluate changes in the functional capacity of the elderly people during hospitalization and categorize the variation in functional capacity during hospitalization.

METHODOLOGY

To respond to the study aims, a descriptive observational study was designed. The studied population was the elderly population hospitalized in an Internal Medicine service of a Central Hospital. The sample that integrates this study was selected through the accidental non-probabilistic sampling method.

The following inclusion criteria were defined: age over 65 years old, cognitive capacity to respond orally and coherently to the questions asked and physical capacity to carry out the tests required in the evaluation carried out.

The following instruments were used:

1. Barthel Index (BI)

The BI is a scale that aims to assess independence in carrying out 10 ADLs, namely, eating, personal hygiene, bathing, using toilets, controlling anal and bladder sphincters, dressing and undressing, going up and down stairs, transferring from chair to bed and ambulation. ⁽⁹⁾

By applying this scale, we obtain a score ranging from 0 to 100 points, with 0 representing total dependence and 100 independence for all ADLs. The minimum clinically significant difference was established for a negative variation between 10 and 20 points ^(10,11). In this study, functional decline will be classified as defined by Andrew et al⁽¹¹⁾:

- Negative variation of less than 10 points – not significant, return to the baseline function;
- Negative variation between 10 and 20 points – moderate persistent functional decline;
- Negative variation of 20 or more points – catastrophic disability (total loss of function in 2 ADLs or new need for assistance in 4).

2. Short Physical Performance Battery (SPPB)

The SPPB evaluates the balance, speed, strength and resistance of the lower limbs, through the performance of three tests: standing balance with the feet in three different positions, these being tandem, semi-tandem or side-by-side (SPPB 1) ; walk 2.44 m (SPPB 2); getting up and sitting down on a chair without the help of the upper limbs five times (SPPB 3)^(12,13).

These tests are evaluated by counting the time taken to complete them, later converted into an ordinal score that varies from 0, for the worst performance, to 4 points, for the best performance. The final result varies between 0 and 12, being obtained by adding the scores in the three tests and can be categorized as follows:

- from 0 to 3 points - disability or very poor performance;
- 4 to 6 points – low performance
- 7 to 9 points - moderate performance
- 10 to 12 points - good performance

From the final result, we can infer about mortality, institutionalization and risk of developing disability, in addition to giving an overview of the functional status of the elderly people ^(13,14)

3. Handgrip strength (HGS)

HGS was evaluated using the Electronic Hand Dynamometer. Two attempts were made in the dominant hand, registering the best mark reached. The elderly people remained seated with the elbow flexed at 90°, and, during the test, they were stimulated and encouraged to exert as much strength as possible. Strength was classified using a specific scale that comes with the dynamometer and is divided into three categories: Weak, Normal or Strong. This direct assessment makes it possible to infer about dependence on the functional capacity of

the elderly people in ADL directly related to hand strength, such as, for example, dressing and undressing and eating. It should be noted that handgrip strength is a good indicator of mortality and morbidity in the elderly population. Low levels of handgrip strength are often associated with frailty, being a good predictor of mortality, that is, people who have lower HGS will probably die before others who have higher values^(15,16).

The study took place between May and July 2021. Data collection was carried out in the first 24 hours after admission and at discharge. In the first moment, after signing the informed consent, sociodemographic data were collected through a questionnaire, the Barthel Index was applied, the SPPB tests were performed, and handgrip strength was evaluated. Whenever necessary, breaks were taken between the evaluation moments. At discharge, the Barthel Index, the SPPB were applied, and handgrip strength was assessed.

This study was approved by the Health Ethics Committee of SESARAM on May 11, 2021, expressed in Opinion No. 29/2021.

For data processing, IBM SPSS version 23 was used, and descriptive and inferential statistical analysis was performed.

RESULTS

The study included 20 elderly people with a mean age of 70.55 ± 6.93 , of which 11 were female and 9 were male. The entire sample shares the same characteristics in terms of their own or family residence, as well as all living with family members or caregivers, 60% are married, 15% divorced, 15% widowed and 10% single. The analysis carried out showed that the reason for hospitalization did not have any statistically significant relationship with any of the other variables under study. The length of stay varied between 6 and 32 days with an average of 12.3 ± 6.47 days.

Table 1 – Comparison of assessments on admission and discharge using the non-parametric Wilcoxon test

		Barthel	SPPB 1	SPPB 2	SPPB 3	SPPB Total	HGS Kg
Average	Admission	82.75	2.35	1.6	1.25	5.2	17.685
	Discharge	69.25	1.8	1.2	0.85	3.85	15.015
<i>Value of p</i>		0.006	0.093	0.057	0.046	0.05	0.005

Overall, when comparing the averages of the values obtained in the two evaluations performed, it is possible to observe that in all the results there is a tendency towards a decrease in the values obtained in the second evaluation, that is, at the time of discharge, values were obtained lower than those obtained in the evaluation carried out on admission. These differences are statistically significant for the Barthel index ($p=0.006$), SPPB 3 ($p=0.046$), total SPPB ($p=0.05$) and handgrip strength ($p=0.005$).

Analyzing the results obtained in the assessment using the Barthel Index (Table 2), it appears that between assessments there was an average variation of 13.5 ± 19.6 points for a minimum of -10 points and a maximum of 65 points.

Table 2 – Average variation of the Barthel Index between admission and discharge

Barthel Index	
Average	13.5
Standard deviation	19.6
Maximum	65
Minimum	-10

It was also performed the classification of the variation of scores according to what was defined by Andrew et al⁽¹¹⁾.

Table 3 – Barthel index variation classification between admission and discharge

Variation	Frequency	%
Positive variation	2	10
No variation	5	25
Negative variation:		
<10	4	20
10 to 20	4	20
≥20	5	25

The positive variation occurred in two of the participants and five maintained the values of the first evaluation. Regarding the negative variation, which occurred in 13 of the 20 participants, it appears that in 4 it has no clinical significance, while we can classify 4 with moderate persistent functional decline and 5 with catastrophic disability. With these data, it can be stated that, in addition to the statistical significance shown in Table 1, in 45% of the sample the negative variation also had clinical significance.

With regard to the total SPPB, categorization was carried out, according to the cut-off points defined by the author, at both evaluation times (Table 4) and once again the trend towards worse results at discharge is evident.

Table 4 – Categorization of the total SPPB score at admission and discharge

Total SPPB	Participants	
	Admissão	Alta
0 to 3 points - disability or very poor performance	6	10
4 to 6 points – low performance	8	5
7 to 9 points - moderate performance	4	4
10 to 12 points - good performance	2	1

Table 5 presents the classification of handgrip strength. The results show that at no time were values classified as Strong obtained and that the number of participants classified as Weak increased considerably at discharge.

Table 5 – Classification of handgrip strength at admission and discharge

Handgrip strength	Participants	
	Admission	Discharge
Strong	0	0
Normal	9	5
Weak	11	15

DISCUSSION

The results obtained demonstrate a statistically significant difference in the assessment of functional independence, as the average Barthel Index score at discharge is lower than that at admission. This result can also be observed in several studies⁽¹⁷⁻¹⁹⁾ where there is a decrease in values at discharge compared to admission. The classification of the score made allowed to identify more clearly the impact of this effect on the functionality and independence of the participants.

In this study, the SPPB presented an average of 5.2 ± 3.381 on admission and an average of 3.85 ± 3.483 on discharge, emphasizing that 50% of the sample was categorized with disability or very poor performance at discharge and that 90% were at a value of 9 or below upon admission and 95% at a value of 9 or below upon discharge. We found in the literature several studies that consider values below 10 as values and reference for mobility deficit or even for characterizing the state of frailty, conditions that predispose to falls and increase dependency⁽²⁰⁻²²⁾. The SPPB allows identifying elderly people at high risk of functional limitations of the lower body and recognizing individuals who could benefit from preventive intervention⁽²¹⁾.

The average handgrip strength decreased significantly in the last evaluation, in relation to the first, with a higher percentage of participants being classified as Weak in the second evaluation. This result is in line with the consulted literature^(23,24).

In all evaluated parameters, a decrease in values was found between the first and second evaluation, namely in handgrip strength and SPPB, which may indicate, according to Legrand et al., a greater risk of death⁽²⁴⁾.

Although the number of participants in this study does not allow the generalization of the results, it is clear that this evaluation provides important data for the clinical practice of Rehabilitation Nurses. Reduced mobility during hospitalization is associated with functional decline but is identified in the scientific literature as a modifiable factor⁽²⁵⁾. Several studies successfully tested interventions based on exercise programs, with different methodologies, implemented during hospitalization^(23,26,27). One of the common aspects of these interventions is personalization based on the assessment of the functional status of the elderly at the time of admission. Rehabilitation Nurses are, in the multidisciplinary teams of inpatient services, the most prepared professionals with the core skills that allow them to carry out diagnoses and plan individualized interventions to minimize or reverse functional decline during hospitalization. This study presents an evaluation model that is easy to implement and can be replicated in the clinical practice of Rehabilitation Nurses.

CONCLUSION

The results found show that hospitalization has a direct impact on the functional capacity of the elderly people, causing them to present functional decline at the time of discharge, compared to the moment of admission to the Internal Medicine service.

The average value found in the SPPB total score on admission indicates a relative risk of disability related to mobility and a high risk of rehospitalization or death.

These results make evident the need for specialized intervention by Rehabilitation Nurses in this specific population during hospitalization. In the exercise of their specific skills, Rehabilitation Nurses can identify the risk of functional loss and design personalized intervention plans that allow not only to minimize the impact of hospitalization on functional capacity, but also to reverse some of its already installed effects. It is, therefore, imperative that inpatient services that welcome elderly people have Rehabilitation Nurses in their multidisciplinary teams in an adequate ratio that allows an effective fight against the phenomenon highlighted in this study.

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Conceptualization: EM, AA, LP

Data curation: EM

Formal analysis: EM,LP

Investigation: LS, EM

Methodology: EM, LP

Project administration: EM, LS

Visualization: EM,AA

Original draft writing: EM, LS,AA

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