Original Article

Evaluation of functional capaciy in elders with encephalic vascular accident*

Avaliação da capacidade funcional de idosos com acidente vascular encefálico

Evaluación de la capacidad funcional de adultos mayores con accidente vascular encefálico

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ABSTRACT

Objective: To evaluate the functional capacity of elders with encephalic vascular accident (EVA) and to examine the association between sociodemographic variables and functional capacity. **Methods:** Interviews with 44 elders who had EVA were conducted during their assessment and treatment in the data collection settings. The instrument contemplated clinical and social-demographic variables. Functional Independence Measure (FIM) was used to measure the subjects' functional capacity. **Results:** Most subjects were between 60 and 69 years of age. The MIF had good internal consistency reliability estimate. Subjects had a mean score of 97.0 on FIM. Mann-Whitney test indicated that participants who had access to health care services had higher FIM scores than individuals without health care access. Pearson's correlation analysis indicated a significantly negative correlation coefficient between age and FIM score. **Conclusion:** Encephalic vascular accident is associated with alterations in functional capacity of the sample of this study. This finding suggests the need for the use of effective rehabilitation strategies to help individuals who have decreased functional capacity due to normal aging and/or sequela to encephalic vascular accident.

Keywords: Aged; Cerebrovascular accident; Geriatric assessment

RESUMO

Objetivo: Avaliar a capacidade funcional de idosos com acidente vascular encefálico (AVE) e verificar a relação, bem como a influência de variáveis sociodemográficas e de saúde na capacidade funcional desses sujeitos. **Métodos:** Foram realizadas entrevistas com 44 idosos, vítimas de AVE, durante o atendimento nos locais de coleta de dados. O instrumento de coleta de dados contemplou dados sociodemográficos e clínicos. Para avaliar a capacidade funcional dos sujeitos foi aplicado o instrumento de Medida de Independência Funcional (MIF). **Resultados:** Houve predomínio da faixa etária entre 60 e 69 anos. A MIF apresentou boa consistência interna. A pontuação total MIF dos apresentou média de 97,0. Os pacientes com acesso ao serviço de saúde apresentaram valores superiores aos dos indivíduos que não tinham acesso (Teste de Mann-Whitney). Foi observada correlação negativa entre a MIF e seus domínios e a idade (Pearson). **Conclusão:** O AVE causou alteração na capacidade funcional dos sujeitos da pesquisa, o que aponta para a necessidade de se investir em estratégias de reabilitação que venham a amenizar as perdas funcionais advindas da própria idade e, principalmente, das seqüelas de AVE.

Descritores: Idoso; Acidente vascular encefálico; Avaliação geriátrica

RESUMEN

Objetivo: Evaluar la capacidad funcional de personas adultas mayores con accidente vascular encefálico (AVE) y verificar la relación, así como la influencia de variables sociodemográficas y de salud en la capacidad funcional de esos sujetos. **Métodos:** Fueron entrevistadas 44 personas adultas mayores, víctimas de AVE, durante la atención en los locales de recolección de datos. El instrumento de recolección de datos incluyó datos sociodemográficos y clínicos. Para evaluar la capacidad funcional de los sujetos se aplicó el instrumento de Medida de Independencia Funcional (MIF). **Resultados:** Hubo predominio del grupo etáreo comprendido entre 60 y 69 años. La MIF presentó buena consistencia interna. La puntuación total de la MIF presentó un promedio de 97,0. Los pacientes con acceso al servicio de salud presentaron valores superiores a aquellas personas que no tenían acceso (Test de Mann-Whitney). Fue observada una correlación negativa entre la MIF y sus dominios y la edad (Pearson). **Conclusión:** El AVE causó alteración en la capacidad funcional de los sujetos de la investigación, lo que indica la necesidad de invertir en estrategias de rehabilitación que amenicen las pérdidas funcionales procedentes de la propia edad y, principalmente, de las secuelas del AVE.

Descriptores: Anciano; Accidente cerebrovascular; Evaluación geriátrica

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INTRODUCTION

The longevity increase, a current world reality, favors functional alterations to individuals that result, many times, in a predisposition towards the non-transmissible chronic diseases and its sequelae, almost always disabling, with emphasis to the systemic arterial hypertension, the *diabetes mellitus*, the rheumatoid arthritis, and the cerebral vascular accident[1-2].

The present study will approach, specifically, the cerebral vascular accident (CVA), due to its great incidence in the elderly population and the functional capacity limitations its sequelae may provoke to such individuals lives.

The CVA is defined as a sudden neurological deficit, originated by a vascular lesion, covering complex vessel and blood element interactions, and the hemodynamic variables[3]. These alterations may provoke vessel obstruction, causing ischemia, due to the absence of blood flow, in this case, known as ischemic CVA, as much as they can cause the vessels breakup and intracranial hemorrhage, known as hemorrhagic CVA.

The CVA provokes alterations, leaving sequelae that are, several times, related to the walking, limbs movement, spasticity, sphincter control, performing daily life activities, personal care, language, eating, to the cognitive function, sexual function, depression, professional activity, vehicles driving and leisure activities. Therefore, the AVE may compromise an individual's life in an intense and global way[4]. Such functional alterations interfere in their daily life activities (DLA), making them dependent and with no life of their own, causing social isolation and depression, unstructuring such people's lives and, consequently, their families'.

Among the individuals who survive an AVE, 15% do not present damages to their functional capacity; 37% demonstrate a slight alteration, but are still able to take care of themselves; 16% present moderate incapacity, which means they are able to walk by themselves, and need help to get dressed; 32% demonstrate intense or serious alteration on their functional capacity, needing help both for walking and for personal care, when they are not restrained in a wheelchair or bed, needing constant care[5].

The conduct taken upon a CVA in acute phase is essential and may reduce such affection lethality[3-4]. After the episode, rehabilitation treatment should be initiated, in an early phase, so as to mitigate the incapacities, ensuring autonomy, if not completely, at least partially. That is why it is necessary for the multi-disciplinary team to have specific preparation to properly provide care to such subjects.

The nurse, as a member of the multi-disciplinary healthcare team, should be aware of both the prevention of CVA risk factors and sequelae and consequences of the illness, so that these individuals receive an individual nursing care in the different levels of the rehabilitation process, and their functional capacity is preserved to the maximum extent, assuring a good quality of life[6].

In this context, the present study aimed to assess the elderly with CVA functional capacity and verify the relationship as well as the socio-demographic and health variables related to the functional capacity of such subjects.

The results are expected to offer subsidies for the planning and implementation of rehabilitation services that contemplate human resources, specially nurses, which are prepared, and equipment that are appropriate for the care of the elderly population particularities and specificities; contributing, therefore, to the functional capacity improvement and, consequently, to the people's quality of life.

METHODS

Study type and sample

This is a transversal descriptive exploratory study, performed with elderly people, victims of CVA and treated at different healthcare service providers in the municipality of Campinas: at the Neuro clinic ambulatory of a university hospital, at the Municipal Rehabilitation Center, and at the Municipal Health Center.

The sample adopted in this study was a convenience sample and it comprised elderly people which complied with the following inclusion criteria: Last CVA episode more than 60 days before, so that, in case there were sequelae, the patient would have had a minimum adaptation time range; being able to communicate and agree to participate in the study, according to the Informed Consent Term. The elderly with communication difficulties that would impact the interview were excluded.

The patients being treated at the Rehabilitation Center and in the Ambulatory were considered subjects with access to the healthcare services – initially 34 elderly people – for they were able to go to the institutions in order to receive the treatment. However, during the data collection period, two of the selected patients were not attending the Rehabilitation Center, because they were not able to move to the location, therefore, their interviews were made in their domiciles, once the services mentioned do not offer domicile treatment. Therefore, these two elderly were considered as subjects with no access to the healthcare service, which includes patients linked to the Healthcare Center that cannot move and go to the Center and receive domicile treatment. Therefore, this study sample was comprised of 44 elderly people, of which 32 had access to the healthcare services (28 patients were followed up in the Neuro Clinic Ambulatory, and 4 in

the Rehabilitation Center) and 12 had no access to the services (10 elderly people were linked to the Healthcare Center, and 2 to the Rehabilitation Center).

Instruments and data collection procedures

The data collection instruments contemplated the socio-demographic (age, sex, personal and family income, family composition, and caregiver) and clinical data (issues related to the CVA episode, limitations imposed by the CVA, risk factors). In order to assess the functional capacity, the Functional Independence Measurement instrument (FIM) was applied, translated and validated in Brazil[7-8], and indicated for the elderly assessment for having important parameters related to the functional capacity in the elder years.

According to the revised literature, the FIM has been utilized to assess the results of rehabilitation treatments in patients with rachimedular trauma, CVA and skull trauma. The FIM usage with elderly people is recommended and has been expanding, once it covers, besides the motor domain, the cognitive and social domains, parameters that are important for the elderly functional assessment[9].

The FIM verifies the individual performance accomplishing a group of 18 tasks regarding the motor domain (self-care, sphincter control, transfers, locomotion) and social cognitive (communication and social cognition). The value attributed to each task assessed may vary from one (total assistance) to seven (complete independence), therefore, the total FIM score (FIMt) ranges between a minimum of 18 and a maximum of 126.

The data were collected through individual interviews, performed by one of the authors, before and after the patients' treatment by different healthcare professionals in the Neuro Clinic Ambulatory and the Rehabilitation Center, along with a carer, and at the elderly domiciles, for the ones who did not have access to the healthcare service.

Data Analysis

The following analyses were done:

- A descriptive analysis of the quantitative and category variables with position measurements (average, median, minimum and maximum) and dispersion (standard deviation);

- Cronbach alpha coefficient in order to assess the FIM internal consistency. The value $\geq 0,70$ was considered satisfactory;

- Mann-Whitney: in order to compare the groups with and without access to the healthcare services and the FIM domains;

- Pearson correlation coefficient(r) to verify the existence of a correlation between the FIM domains and the age. The following criteria were adopted to classify the correlation coefficients: $<0,3$ (weak correlation), $\geq 0,3$ to $<0,5$ (moderate correlation) and $\geq 0,5$ (strong correlation);

- Univariate Analysis of Variance (ANOVA) to analyze the influence of each variable to the FIM domain scores. The independent variables were: age, caregiver, previous CVA, last CVA, and CVA limitations (sequelae). The multivariate Analysis of Variance (MANOVA) was used to identify the variation among all FIM domain scores (dependent variables) as of the independent variables already mentioned. MANOVA is utilized to test the significance of the difference between the averages of two or more groups in relation to two or more dependent variables, considered simultaneously.

The significance level adopted for the statistic tests was of 5% ($p \leq 0,05$).

Ethical Aspects

The research project was approved by the Research Ethics Committee of Faculdade de Ciências Médicas, Universidade Estadual de Campinas, Legal opinion n. 285/03. The study participants signed the Term of Informed Consent, according to Resolution n. 196/96 of the Conselho Nacional de Saúde (National Health Department).

RESULTS

Forty four patients participated in the study, 27 of which (61.4%) were males; ages ranged from 55 to 87 years, with an age bracket prevalence of 60 to 69 years (43.2%), and an average of 66 years of age; most of the elderly was retired or pensioner (72.7%). The caregiver presence was verified among 61.4% of the subjects, whose function was mainly assumed by the spouse (Table 1).

With regard to the CVA occurrence, 34.1% of patients presented previous episodes; the CVA left sequelae in 42 patients, of which, the most common were hemiparesis and paresis, in 50.1% and 31.8% of subjects, respectively. Other sequelae presented by 40.8% of the elderly were migraines, convulsive crisis, facial paralysis, language, and memory alterations, besides shaking. From the 44 individuals interviewed, only 10 (22.7%) were going through physical therapy follow up.

The functional capacity assessment scores obtained with the FIM application are presented on Table 2. The total scoring (FIMt) ranged from 32 to 125, with an average of 97.0 ($\pm$ 22,3). For the motor domain (FIMm), the observed variation was 19 to 91, with an average of 68.9 ($\pm$ 17,4) and for the cognitive / social domain (FIMcs), the scores ranged between 13 and 35, with an average of 28.1 ($\pm$ 7,3).

Comparing the FIMt scores and its domains ones, it is possible to observe, through Table 3, that patients with access to the services presented values that were superior to the ones presented by the individuals who did not have access to the healthcare service and statistically meaningful (p≤0,005).

Table 1 – Socio-demographic characterization of the research subjects. Campinas, 2004

Socio-demographic data	N	%
Age		
< 60 years	9	20.4
60 - 69 years	19	43.2
70 - 79 years	13	29.5
≥ 80 years	3	6.8
Sex		
Masculine	27	61.4
Feminine	17	38.6
Caregiver		
No	17	38.6
Yes	27	61.4
Spouse	17	38.6
Son/Daughter	7	15.9
Other	3	6.8
Occupation Retired/Pensionist		
Yes	32	72.7
No	12	27.3

Table 2 – Measurement of the research subjects FIM domains. Campinas, 2004

FIM	N	Average	S.D.	Observed Variation	Possible Variation
FIMm	44	68.9	17.4	19 – 91	13 – 91
FIMcs	44	28.1	7.3	13 – 35	5 – 35
FIMt	44	97.0	22.3	32 – 125	18 – 126

FIMm= motor FIM; FIMcs= cognitive/social FIM; FIMt= total FIM

Table 3 – FIM domain comparison among the subjects who had access to the healthcare service and the ones who did not. Campinas, 2004

FIM	With access(n= 32) Average (± sd) Median	Without access(n=12) Average (± sd) Median	Value of p*
FIMm	74.2 (± 11.3) 76.00	50.7 (± 22.5) 53.50	p= 0.0028
FIMcs	30.1 (± 5.8) 32.50	21.2 (± 8.0) 20.00	p= 0.0029
FIMt	104.4(± 14.0) 107.00	71.9 (± 27.4) 72.00	p= 0.0004

* Mann-Whitney test
FIMm= motor FIM; FIMcs= cognitive/social FIM; FIMt= total FIM

There was a meaningful negative correlation that ranged from moderate to strong magnitude between the FIMt and its domains and age (Table 4). Thus, it is possible to state that the older the age, the smaller the FIM scores.

The univariate analysis (ANOVA) shows that both the caregiver presence (p=0.0372) and the hemiparesis presence (p=0.0011) interfered in the FIM motor domain; age (p=0.0348) and the presence of a caregiver (p=0.0063) interfered in the FIMcs score; and age (p=0.0206), the presence of a caregiver (p=0.0044), and hemiparesis (p=0.0009) influenced in the FIMt score (Table 5).

Table 4 – Pearson Correlation Coefficient values among FIMt and its domains and age. Campinas, 2004

FIM Domain	Age
FIMm	r= - 0.47 p= 0.0010
FIMcs	r= - 0.44 p= 0.0024
FIMt	r= - 0.51 p= 0.0003

FIMm= motor FIM; FIMcs= cognitive/social FIM; FIMt= total FIM

Table 5 – Statistical significance values (p-value) in the univariate analysis (ANOVA) and multivariate analysis (MANOVA), considering the scores of the motor, cognitive/social and total FIM scores and the independent variables researched. Campinas, 2004

ANOVA	Value of p		
Variables	FIMm	FIMcs	FIMt
Age	0.0830	0.0348	0.0206
Caregiver	0.0372	0.0063	0.0044
Previous CVA	0.3619	0.7602	0.3719
Last CVA	0.2869	0.6420	0.5320
Hemiparesis	0.0011	0.1461	0.0009
Paresis	0.4182	0.7456	0.4149
Paresthesia	0.8771	0.6991	0.9720
Visual Impairment	0.7229	0.6028	0.9400
MANOVA			
General	0.0010	0.0095	0.0001

FIMm= motor FIM; FIMcs= cognitive/social FIM; FIMt= total FIM

Considering the independent variables of age, caregiver presence, previous CVA, last CVA, hemiparesis, paresis, paresthesia and visual impairment, and the dependent variables FIMt, FIMcs and FIMm, it is possible to observe that the caregiver and the hemiparesis presence continued interfering in the FIMm score, considering the average on this domain was smaller (average=65.5) for the subjects who had a caregiver and

for the individuals with hemiparesis (average=62.0) when compared to the rest of the group, which did not have a caregiver (average= 79.0) or hemiparesis (average=79.8), respectively.

The age and the caregiver presence maintained the influence on the FIMcs scores, where the average was smaller (average=25.7) for the subjects that had a caregiver, when compared to the ones without a caregiver (average=32.2).

The age, caregiver presence and hemiparesis interfered in the FIMt results, where it was possible to observe a smaller average (average=87,4) when compared to the individuals without a caregiver (average=111,3) and without hemiparesis (111,1). The age, just as with the FIMcs, presented negative correlation (r=-0.43) with the FIMt, that is, the older the age, the smaller the FIMt and FIMcs values.

DISCUSSION

International studies performed with larger population samples, with CVA victim subjects, show similar socio-demographic data to this study, including the average age, above 60 years, the sex, male subjects, and the marital status, married individuals[10-11].

The encephalovascular diseases frequency grows exponentially with age[11]. In a paper studying the reincidence of such diseases among the extreme age groups showed that the encephalovascular disease is 340 times more incident on people who are 65 years old or more, when compared to the age group ranging from 15 to 24 years old[12]. Other studies prove that the CVA incidence increases with age[13-16].

In the present study, most of the interviewees lived with two generations in their domicile (n= 24), of which the predominant one was the son or daughter. Similar data were found in a study with elderly people in the city of São Paulo, where it was verified that more than half of them lived with their children[17].

The individuals interviewed were, mostly, the main income source in the house, with wages ranging from one to three minimum wages; the family monthly income was bigger than one and smaller than three minimum wages, demonstrating a low family income, which corresponds to the data found by the study performed in Brazil's southeast region[18-19].

Concerning the caregiver presence, in both patient groups, that is, the ones being treated in the ambulatory and at the Rehabilitation Center, and the ones being treated at home, most of the subjects needed a caregiver, whose function, most of the times, was assumed by the spouse.

The CVA, when serious, can bring great impacts to the patient's and his/her family's physical and psychological well-being. Other studies, with similar data to the ones found in the present study, show evidence that most of the CVA episode survivors become dependent on another person with regard to self-care, and the DLAs, due to the disabilities caused by the disease[20].

Regarding the CVA incidence, it was possible to verify that 29 patients had no history of a previous episode, whilst 15 had had one, two, or even three before. Still regarding the CVA incidence, among the individuals who had had a CVA, 15% and 38% presented a new episode, from which 50% were fatal[5].

As to the last CVA, the incidence ranged from more than 2 months to less than 12 and above 24 months, with a maximum time limit of 19 years. In similar studies, the time range between the last CVA episode and the data collection was between a minimum of 14 days[21] and a maximum of six years after it[22].

The ischemic CVA prevailed. A total of 42 patients presented sequelae, mainly hemiparesis.

The most common CVA is the ischemic CVA, and is corresponds to approximately 80% of the encephalovascular disease cases[4]. The emphasis is given for it is one of the main causes of hospital admissions and prolonged admission among elderly patients with more than 65 years of age[15].

The rehabilitation has been one of the main treatment options after the CVA episode, providing real improvement to such individuals that recover either totally or partially from the sequelae caused by the disease. The motor, cognitive, emotional and social sequelae cause damages to the DLAs performance and, consequently, to these individuals´ autonomy and independency.

In a study about the rehabilitation of an elderly subject with CVA, researchers found data indicating that patients with 80 years of age or more successfully complete the rehabilitation program and most of them return to the community[14].

The FIM was able to determine the subjects that had access to healthcare services and the ones who did not. Data obtained demonstrated that those subjects who had access to healthcare services presented higher FIM and domain values than the ones who did not have access to the service.

The patients who had access to the healthcare service presented superior FIMt (p=0,0004), FIMm (p=0,0028) and FIMcs (p=0,0029) averages in comparison with the subjects who did not have access to the service. Although it is not possible to state, the rehabilitation and the CVA treatment in a post-acute phase are undeniably relevant.

Age was also an important variable in the study, and presented negative correlation with the FIM. Similar results were obtained, where the aging was directly

related to the worst FIM results[13-14].

Researchers observed that, in spite of the fact elderly people with more than 80 years of age presented lower FIM values than the ones that were younger than 80, most of the elderly in the different age brackets successfully completed the rehabilitation and returned to the community[14].

Therefore, it is possible to observe that age and the factors related to it should be considered in the rehabilitation treatment of CVA victim individuals.

The caregiver and hemiparesis presence influenced the FIMm values, while age and the caregiver presence influenced the FIMcs. Concerning the FIMt results – these were more impacted by age, the caregiver and hemiparesis presence.

Hemiparesis influenced the FIMm and the FIMt, which may be related to the functional capacity alteration provoked by such sequelae, impairing the self-care and the DLAs performance by these subjects.

The caregiver presence is considered essential to on such patients treatment so as to stimulate them and assist in daily life activities, however, his/her intervention may influence in the CVA patients' recovery and rehabilitation, not only in a positive way, through incentives, but also negatively, when they underestimate or overestimate the patients' capacity[10].

In a study with elderly after the first CVA, it was possible to observe that a better cognitive state in the admission was related to a better result for the FIMm and with a shorter time as an inpatient[15]. In the same study, patients with cognitive alterations demonstrated low rehabilitation results. The authors justify saying a normal cognition level is necessary to receive specific treatment techniques.

CONCLUSIONS

For the elderly people in this study, age was inversely proportional to the FIM and its domains results, that is, the more the age, the less the functional capacity presented by the interviewees, which points out to the need of investing in rehabilitation strategies that diminish the functional losses derived from age and, mainly, from the CVA sequelae. Besides, the subjects who had access to the healthcare service had a better functional capacity than the ones who did not.

With these results found, it is possible to say that the CVA caused alterations to the functional capacity of the research subjects.

The present study may be used as a basis for future studies related to the theme. There is a need of research in order to assess the caregiver presence influence in the functionality of CVA victim individuals, for it influenced negatively both groups (with and without access to healthcare services) This shows the need of having strategies and guidance implemented to elderly people's caregivers, considering the stimulation and autonomy and independence maintenance.

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