Original Article

FUNCTIONAL CAPACITY AND QUALITY OF LIFE AMONG ELDERLY PATIENTS WITH OR WITHOUT DYSPHAGIA AFTER AN ISCHEMIC STROKE

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ABSTRACT

OBJECTIVE. To analyze the functional capacity and quality of life of elderly people after Ischemic stroke, comparing patients with dysphagia with those free from dysphagia.

MÉTODOS. This was a cross-sectional study of 60 elderly stroke patients, 30 of whom had dysphagia 30 of whom were free from dysphagia. The Mini-Mental test was used to assess subjects' cognitive status. The Katz, Lawton, Barthel and SF-36 scales were used.

RESULTS. Functional capacity was similar in both groups. According to the SF-36, the subset without dysphagia exhibited more Pain, but better General Health. Functional Capacity, Role-Physical, General Health, Vitality, Social Functioning, Role-Emotional and Mental Health were similar for both subsets. Among the men functional capacity was similar in both subsets, irrespective of the instrument used. Among the women, functional capacity was similar while on the quality of life assessment Vitality scores were higher in the subset without dysphagia. Neither functional capacity nor quality of life were affected by low income. There was also no difference between the two subsets based on having or not having a carer.

CONCLUSIONS. 1) Functional Capacity was similar in the two subsets. 2) The subset without dysphagia had better General Health.

KEY WORDS: Quality of life. Deglutition disorders. Elderly Seniors.

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INTRODUCTION

Mortality among the elderly after ischemic strokes is a public health problem in Brazil. Furkin[1] reports that neurogenic dysphagia is present in approximately 25 to 50% of strokes and points out that the prevalence of strokes is elevated among elderly people, noting that 45% of patients exhibit deglutition problems during the acute phase of an AVE, often with persistent aspiration. In elderly patients, strokes can cause oropharyngeal dysphagia, leading to deglutition disorders as a consequence.[2] Harrison[3] reports that patients who progress with dysphagia/deglutition disorders must be adequately assessed, since this disorder can lead to aspiration of gastric or oropharyngeal contents with aspiration pneumonia or pneumonitis as a consequence. Schelp[4] reported a 65 to 81% rate of dysphagia among patients with strokes affecting the brainstem (diencephalon, mesencephalon, pons and myelencephalon or medulla oblongata).

Aspiration is defined as the entry of liquid or food into the subglottic region, and is a common sequela of post-stroke dysphagia. According to Daniels,[5] it affects 40 to 70% of stroke patients.

There is a need to increase knowledge about the ageing process in order to provide a basis for measures which can promote healthy ageing and which, as Gai has pointed out, should not be concerned with merely increasing the number of years lived, but, primarily, with ensuring a good quality of life for the elderly population.[6]

The objective of this study was to analyze the functional capacity and quality of life of elderly people after strokes, comparing patients with dysphagia with those free from dysphagia. The study should contribute to the formation of public policies and to healthcare management, helping to reduce morbidity and hospital stays and improving quality of life among the elderly at risk..

METHODS

This was a nested cross-sectional study of a patient cohort (or case series),[7] in which assessment instruments were administered in order to evaluate the functional status and quality of life of 60 elderly patients (aged 60 or over) who had suffered ischemic strokes. The study was undertaken at the *Hospital de Base* which is in the *Distrito Federal* in Brazil and is a center

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of excellence for the treatment of strokes and has a neurology specialist on call 24 hours a day in its emergency department. Patients were assessed in the wards, in the emergency department and in outpatients. Home visits were also undertaken and two other hospitals belonging to the *Distrito Federal* State Health Department were also visited: the *Hospital Regional de Ceilândia* and the *Hospital de Apoio de Brasília*.

A total of 30 patients with dysphagia and 30 patients free from dysphagia were assessed 3 to 12 months after suffering acute strokes. The following inclusion criteria were applied: age greater than or equal to 60 years; a medical diagnosis of stroke (made using clinical criteria and CT scan results in combination) occurring during the period 3 to 12 months prior to recruitment; free from cognitive impairment according to Freitas' sliding-scale of Mini-Mental scores (with the following cut-offs for cognitive impairment = illiterate patients ≤ 15 points, patients with from one to 11 years' education ≤ 22 points, and patients with more than 11 years' education ≤ 27 points);[8] free from impairments (such as aphasia or mechanical ventilation) which would prevent them responding to the questions on the data collection instruments used; and the signature of a free and informed consent form.

As a minimum, clinical assessment of deglutition included the items in Daniels' bedside assessment method.[5] The instruments used to assess functional capacity and quality of life were as follows: 1. the Basic Activities of Daily Living (ADL) scale, which is also known as the Katz Functional Assessment;[9] 2. Lawton's Instrumental Activities of Daily Living (IADL) scale;[10,11] 3. the Barthel Index, which assesses physical disabilities, as used by Mahoney;[12] 4. quality of life assessment using the Brazilian version of the SF-36 quality of life questionnaire, based on Ware[13,14] and Ciconelli.[15,16]

The Mann-Whitney test for independent samples was used for statistical analysis, with the alpha error set at 5%. The following parameters were adopted as independent variables: age (60 to 79 vs. 80 or over), sex, whether the patient had a carer and income (classified as low, medium or high). The following were adopted as dependent variables: the Basic Activities of Daily Living scale - Katz (ADL), the Lawton Instrumental Activities of Daily Living (IADL) scale, the Barthel Index and the Brazilian version of the SF-36 quality of life questionnaire. Tests were conducted to detect associations between two types of variable: predictive variables and the outcome. The predictive variables were age, sex, carer and income, while the outcome was presence or absence of dysphagia (uni or bivariate).

The Kolmogorov-Smirnov test was applied to test whether the data collected followed a normal distribution, which defines whether data are parametric or nonparametric. The results of the test showed that all data were nonparametric, which is why the Mann-Whitney test was chosen.[17,18] The program used for statistical analysis was SPSS for Windows version 13.0 (Chicago, IL, United States), in common with Bisquera.[19]

The research protocol was submitted to the *Distrito Federal* State Health Department's Research Ethics Committee, under number 168/07, and was approved on the 14th of January.

Administration of the SF-36 was authorized by Dr. Rozana Mesquita Ciconelli from the Rheumatology department at the *Universidade Federal de São Paulo*.

Results

The cognitive function analysis of elderly patients in the chronic phase of stroke was carried out using the Mini-Mental and demonstrated that there was no significant difference between the subsets with and without dysphagia.

Functional capacity was measured using the Katz, Lawton and Barthel instruments and was similar for both subsets (p>0.05), irrespective of the instrument employed (Table 1).

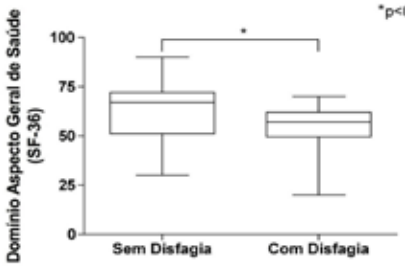
Table 1 - Functional capacity during the chronic phase of stroke in elderly people with and without dysphagia

	With Dysphagia Median (Q1-Q3)	Without Dysphagia Median (Q1-Q3)	p
Functional capacity			
Katz	6 (2-6)	6 (3-6)	0.135
Lawton	16.5 (12-21.75)	21 (12-24)	0.160
Barthel	75 (20-92.5)	85 (57.5-100)	0.072

Q1 = first quartile; Q3 = third quartile

The results of the SF-36 showed that the subset without dysphagia had greater medians and greater variation of absolute values than the subset with dysphagia for the domains of: 1) Pain (p = 0.040) and 2); General Health (p = 0.017). The medians for the subsets with and without dysphagia were similar (p>0.05) for all of the other SF-36 domains. Thus, the subset free from dysphagia exhibited more pain, but a better general health status than the subset with dysphagia.

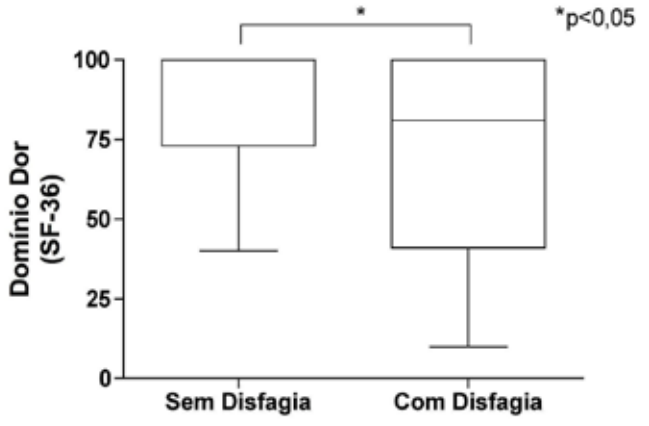
Figure 1 – SF-36 General Health scores for elderly people in the chronic phase of stroke and with and without dysphagia



The sample was 58.3% male (35 people) and 41.7% female.

Among the men, functional capacity measured by the Katz, Lawton and Barthel instruments was similar for the two subsets (p>0.05), irrespective of instrument. When the SF-36 results were analyzed by sex and subset, it was observed that: 1) men free from dysphagia had a greater median score for the General

Figure 2 - SF-36 Pain scores for elderly people in the chronic phase of stroke and with and without dysphagia



Health domain than men with dysphagia (p = 0.003); and 2) the median scores for all other domains were similar for men with and men without dysphagia (p>0.05).

In Figure 2, it can be observed that the median score and variation for the Pain domain were greater in the subset free from dysphagia than in the subset of dysphagia sufferers. The difference is significant (p = 0.04). The median, the third quartile and the maximum score were all 100 in the subset without dysphagia.

Among the women, functional capacity measured by the Katz, Lawton and Barthel instruments was similar for the two subsets (p>0.05), irrespective of instrument. When the SF-36 results were analyzed by sex and subset, it was observed that: 1) women free from dysphagia had a greater median score for the Vitality domain than women with dysphagia (p = 0.003); and 2) the median scores for all other domains were similar for women with and women without dysphagia (p>0.05).

The results for functional capacity and quality of life of patients with and without deglutition disorders and with low income showed that: (1) functional capacity was similar for the two subsets (p>0.05) irrespective of instrument; (2) the median score for Pain was greater in the subset without dysphagia than in the subset with dysphagia (p = 0.015); and (3) the median scores for all other SF-36 domains were similar for patients with and without dysphagia (p>0.05).

An absolute majority (76.7%) of the elderly stroke patients had no income (less than the minimum monthly wage), while 13.3% were classified as having a medium income (between one and two times the minimum wage) and 10% were classed as having a high income (from three to four times the minimum wage.

Functional capacity was similar for both subsets (p>0.05) in the medium income and the high income groups, irrespective of instrument. Furthermore, the median scores for all SF-36 domains were similar for the subsets with and without dysphagia.

Elderly patients who had or did not have carers had similar functional capacity in the subsets with and without post-stroke dysphagia (p>0.05), irrespective of instrument. The median scores for all SF-36 domains were similar for the subsets with and without dysphagia (p>0.05), for patients with and without carers.

In the 60-79 age group, functional capacity was greater in the subset without dysphagia than in the subset with dysphagia (p=0.002), according to the SF-36 Functional Capacity domain. The same instrument also detected the following: 1) the median score for limitations due to physical aspects was greater among those free from dysphagia than among those suffering from dysphagia (p=0.029); (2) the median score for General Health was greater in the subset without dysphagia than in the subset with dysphagia (p=0.0001); and (3) the median scores for all other domains were similar in both subsets (p>0.05).

In this same age group (60-79 years), median scores for the Basic Activities of Daily Living sale (Katz), the Lawton Instrumental Activities of Daily Living scale and the Barthel Index were greater for the subset without dysphagia than for the subset with dysphagia.

Among patients aged 80 or over, the median SF-36 Functional Capacity score was lower in the subset without dysphagia than in the subset with dysphagia (p=0.045), while the medians for the two subsets were similar (p>0.05) in all other domains. The median Lawton scale score was lower for the subset without dysphagia (p<0.05).

Discussion

This is a preliminary pilot study, administering the SF-36 to elderly stroke patients and comparing those with dysphagia with those free from dysphagia for the first time in Brazil. The SF-36 has previously been used with elderly *Diabetes mellitus* type 2 patients.[20] Research with elderly stroke victims suffering from dysphagia must comprehend these individuals from a holistic perspective, in which elderly people are seen as subject to their own aging processes, and is an indivisible biological, psychological, social and cultural being. The study presented here, employing as it did all the different instruments described, took account of all of these facets of the elderly patient: biological, psychological, social and cultural, as discussed by Brandão in previous publications.[21,22]

The importance of this study is underscored by the results of another study that demonstrated that 700,000 Americans have had a stroke.[23] The same study states that clinical dysphagia is observed in 42% to 67% of these patients within the first few days after the acute episode.

Among patients in the recovery phase after a stroke, 4.9% develop pneumonia and 30% of those admitted to intensive care units because of severe complications will acquire pneumonia.[24] Twenty percent of stroke patients die within the first year, 35% of them from pneumonia during a hospital stay. This complication is attributed to varying degrees of dysphagia which lead to bronchoaspiration[23] .

Perry[25] reports that 4.7% of people over the age of 55 affected by stroke, which justifies prioritizing actions, both from a clinical point of view and from the point of view of public

policies. According to Perry, dysphagia is often observed in association with stroke, affecting more than 67% of patients during the first 72 hours. In the majority of these cases dysphagia will resolve quickly; approximately half of them during the first 7 days and three quarters within a month.[26]

In this study we did not find any differences between stroke patients with dysphagia and patients free from dysphagia in the cognitive domain of the Mini-Mental. Notwithstanding, it should be remembered that patients with cognitive deficits were excluded from the sample since their replies would not have been reliable. Some of the patients with dysphagia who had cognitive abnormalities probably had this deglutition disorder to a severity that was sufficient to lead to malnutrition and resulting vitamin deficiencies such as B_{12} hypovitaminosis, which can lead to cognitive disorders. Damasceno[27] suggests that differential diagnosis of dementia should consider polypharmacy and associated systemic diseases such as hypovitaminosis B_{12}.

In the study described here, the ability to care for oneself was assessed as part of the modified Basic Activities Of Daily Life (ADL) scale / Katz Functional Assessment,[11] which includes the following: continence, the ability to feed oneself, to wash, to dress and to go to the bathroom in addition to maintaining independence. Two further instruments were also used to assess functional capacity: the Instrumental Activities of Daily Living (IADL) scale/ Lawton Assessment[11,25] and the Barthel Index.[12] Irrespective of instrument, functional capacity was similar for the subsets with and without dysphagia. The presence of dysphagia did not therefore affect the day-to-day activities of these patients. Notwithstanding, stroke patients who were intubated or had aphasia were excluded from the sample studied here and would have had their functional capacity compromised to a greater degree than the patients who took part in this study.

When the sample was broken down by sex, functional capacity remained similar for the subsets with and without dysphagia both among men and among women, irrespective of the instrument used to assess it. Therefore, sex did not have a marked influence on the functional capacity of these elderly stroke patients, with or without dysphagia.

Neither financial income (low income, medium income or high income) nor whether the patient had a carer or not had an effect on the functional capacity of these elderly stroke patients with and without dysphagia.

When patients aged 60-79 were analyzed separately it was found that functional capacity was greater in the subset without dysphagia than in the subset with dysphagia, once more indicating that dysphagia had a deleterious effect on functional capacity, among patients in this age group. Functional capacity according to the Lawton questionnaire was also greater among patients aged 80 or over and free from dysphagia than among those over 80 with dysphagia. One possible reason for this is that patients without dysphagia have a better dietary profile, ingesting normal quantities of both macronutrients and micronutrients. This could be investigated in other research projects, or by extending this study.

The abstract nature of the term "quality of life" is the reason why "good quality" means different things to different people, in different places and on different occasions and it is because of this that there are countless different conceptualizations of quality of life; possibly every single person has their own concept. Therefore, quality of life is a concept that is subject to multiple points of view and which has changed from age to age, country to country, culture to culture, social class to social class and even from person to person. Furthermore, it also varies for a single person as time passes and as a function of emotional states and in response to social, historical, ecological and day-to-day events. This multiplicity of concepts, formulated in such a heterogeneous a manner, makes comparisons difficult and leads to the complexity of the scope of the term "quality of life" that has been described by Freitas.[10] Lawton constructed a model of quality of life among the elderly,[11,28] taking into account the multiplicity of aspects and influences that are inherent to the phenomenon (environmental conditions, behavioral competency, perceived quality of life and subjective wellbeing.) Study and assessment of quality of life have become important in many different areas and subjects and, according to Freitas, have been shown to be important within the elderly population.[10]

Although the decision implied increasing the complexity of the study, the SF-36 was chosen because it has clear interpretations and provides indicators that are established in the international literature and have been validated in Brazil, by Brazier[29] and Ciconelli,[15,16] respectively. This standardized instrument is appropriate for making comparisons with new studies undertaken at other Brazilian research centers.

When the quality of life of elderly stroke patients with and without dysphagia was assessed using the SF-36, it was found that the subset without dysphagia exhibited more Pain, but had better General Health than the subset with dysphagia. The subsets with and without dysphagia were similar in terms of the results for the domains Functional Capacity, Role-Physical, Role-Emotional, General Health, Vitality, Social Functioning and Mental Health. As mentioned earlier, dysphagia can lead to pneumonia caused by aspiration and, among elderly stroke victims, not suffering from dysphagia is associated with a better General Health score. Furthermore, some patients with severe dysphagia may even need nasogastric feeding due to insufficient nutrient intake. However, we were unable to find a plausible explanation in the extant literature for the subset without dysphagia exhibiting more pain.

It was postulated that there may have been a tendency towards social isolation among patients with dysphagia, resulting from difficulties with eating in public even when in a strictly family environment. However, the results of this study did not support that hypothesis, with no difference being detected in the Social domain.

When the quality of life of the subsets with and without dysphagia was analyzed broken down by sex, it was found that men without dysphagia had better General Health than men with dysphagia, with no differences detected in other SF-36 domains. Among the women, Vitality scores were higher in the subset without dysphagia than in the subset with dysphagia, with no differences between the two groups in the other domains (Functional Capacity, Role-Physical, Role-Emotional, Pain, General Health, Social Functioning and Mental Health). The presence of dysphagia therefore leads to poorer General Health and reduced Vitality, among men and women respectively. No

studies assessing this item were located. It is possible that these domains overlap: people with poorer General Health exhibit reduced Vitality. On the other hand, perceptions of General Health and Vitality may differ between the sexes. There are associations between perceived quality of life, subjective well-being and personality mechanisms such as a sense of control, a sense of personal achievement, a feeling of meaning and coping strategies.[10]

Financial income did not have an influence on the quality of life of elderly stroke patients with and without dysphagia who had medium or high incomes. Elderly patients with no income exhibited more pain if they were free from dysphagia. This is probably the result of the fact that the majority of the patient sample had no income, since patients without dysphagia reported more pain.

There was also no significant difference in quality of life between the two subsets of elderly patients based on whether or not they had a carer.

Among patients aged 60-79, scores for the SF-36 General Health domain were better in the subset without dysphagia than in the subset with dysphagia. The two subsets of patients aged 80 or over had similar scores for all SF-36 domains (General Health, Role-Physical, Pain, Vitality, Social Functioning, Role-Emotional and Mental Health.) Therefore, for patients aged 79 or younger, the presence of dysphagia impacts on quality of life since General Health is worse, but does not affect this domain in patients aged 80 or over. One possible reason for this is a better nutritional profile among 60-to-79-year-olds, which was not investigated in this study. It is possible that patients aged 80 or over have poorer diets irrespective of dysphagia, because of lost teeth and reduced taste sensitivity, among other factors. Certain anatomical features may impact older patients more intensely. Teeth wear out over the years and an elevated percentage of elderly people have dental prostheses and/or periodontal disease. The tongue loses papillae and its appearance changes, with varicose veins being common. The vertebrae may suffer osteoporotic and disc and arthrosis injuries. Kyphosis can affect the upper part of the spinal column, in the cervical-dorsal region, reducing the distance between the shoulders and the base of the skull.[10]

In this study it was not feasible to investigate associations between dysphagia and depression specifically, but this aspect will be included in an extension to this research. According to Coster, depression can alter patients' sensitivity to somatic symptoms,[30] and the subject merits investigation using dedicated scales.[31,32,33,34]

Conclusions

1. Analysis of the cognitive function of elderly patients in the chronic phase of stroke with and without dysphagia using the Mini-Mental did not identify any significant difference between the two subsets.
2. Functional capacity, measured using the Katz, Lawton and Barthel instruments, was similar in the two study groups ($p>0.05$), irrespective of instrument.
3. The subset of patients free from dysphagia exhibited more Pain, but better General Health than the subset with dysphagia.
4. Men without dysphagia have better General Health than men with dysphagia.
5. Women free from dysphagia have greater Vitality than women with dysphagia.
6. The functional capacity of elderly patients with or without a carer was similar in both subsets, with and without dysphagia.
7. Among patients aged 60-79, functional capacity was greater in the subset free from dysphagia than in the subset suffering from dysphagia.
8. General Health was better for patients aged 60-79 years and free from dysphagia, when compared with the subset with dysphagia.

No conflicts of interest declared concerning the publication of this article.

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Artigo recebido: 09/04/09
Aceito para publicação: 04/08/09