
BOWEL DYSFUNCTION IN PATIENTS WITH BRAIN DAMAGE RESULTING FROM STROKE AND TRAUMATIC BRAIN INJURY: A RETROSPECTIVE STUDY OF A CASE SERIES

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ABSTRACT: Bowel dysfunction is a common complaint among patients with brain damage due to stroke and traumatic brain injury. The aim of this study was to investigate the prevalence of bowel dysfunction (anal incontinence and intestinal constipation) in patients with brain damage due to stroke and traumatic brain injury admitted for rehabilitation. This is a retrospective case series study, based on the analysis of data from 138 charts of patients admitted in the first half of 2009. The prevalence of bowel dysfunction was 41%, with 33 (24%) cases of anal incontinence and 37 (27%) cases of intestinal constipation. Motor impairment, mobility aid, changes in memory and communication were associated with the presence of anal incontinence. The prevalence of bowel dysfunction is high in this population. Early identification of the symptoms and its related factors promoting bowel retraining, may help to improve the quality of life of patients with bowel dysfunction.

DESCRIPTORS: Constipation. Fecal incontinence. Stroke. Traumatic brain injury.

DISFUNÇÃO INTESTINAL EM PACIENTES COM LESÃO CEREBRAL DECORRENTE DE ACIDENTE VASCULAR CEREBRAL E TRAUMATISMO CRANIENCEFÁLICO: ESTUDO RETROSPECTIVO DE UMA SÉRIE DE CASOS

RESUMO: A disfunção intestinal é uma queixa comum entre pacientes com lesão cerebral decorrente de Acidente Vascular Cerebral e Traumatismo Craniencefálico. Este estudo objetivou pesquisar a prevalência da disfunção intestinal (incontinência anal e constipação intestinal) em pacientes com lesão cerebral decorrente de Acidente Vascular Cerebral e Traumatismo Craniencefálico, admitidos para reabilitação. Trata-se de um estudo retrospectivo de uma série de casos, a partir da análise dos dados de 138 prontuários de pacientes internados no primeiro semestre de 2009. A prevalência de disfunção intestinal foi 41%, sendo 33 (24%) incontinência anal e 37 (27%) constipação intestinal. Comprometimento motor, auxílio locomoção, alterações de memória e comunicação estiveram associados à presença de incontinência anal. A prevalência de disfunção intestinal é alta nessa população, identificá-la precocemente, bem como os fatores relacionados, e promover a reeducação intestinal, poderá contribuir para melhora na qualidade de vida dessas pessoas.

DESCRIPTORES: Constipação intestinal. Incontinência fecal. Acidente vascular cerebral. Traumatismos encefálicos.

DISFUNCIÓN INTESTINAL EN PACIENTES CON DAÑO CEREBRAL COMO RESULTADO DE UNA LESION CEREBRAL TRAUMÁTICA Y ACCIDENTE CEREBROVASCULAR: UN ESTUDIO RETROSPECTIVO DE UNA SERIE DE CASOS

RESUMEN: La disfunción del intestino es una queja común entre los pacientes con daño cerebral debido a una lesión cerebral traumática y accidente cerebrovascular. Este estudio tuvo como objetivo investigar la prevalencia de disfunción del intestino (incontinencia y constipación) en pacientes con daño cerebral debido a una lesión cerebral traumática y accidente cerebrovascular admitidos para la rehabilitación. Este es un estudio retrospectivo de una serie de casos a partir del análisis de los datos de 138 expedientes de los pacientes ingresados en el primer semestre de 2009. La prevalencia de disfunción del intestino fue de 41%, siendo 33 (24%) incontinencia anal y 37 (27%), constipación. El comprometimiento motor, ayuda a la movilidad, cambios en la memoria y la comunicación se asocian con la presencia de la incontinencia anal. La prevalencia de disfunción del intestino es alta en esta población, identificar en forma temprana los factores relacionados, y promover el reentrenamiento intestinal pueden ayudar a mejorar la calidad de sus vidas.

DESCRIPTORES: Estreñimiento. Incontinencia fecal. Accidente cerebrovascular. Lesiones cerebrales traumáticas.

INTRODUCTION

Intestinal constipation is a condition in which individuals present symptoms that prevent them from having a satisfactory intestinal elimination. It can be associated with fecal consistency, evacuation frequency, effort to reach a satisfactory elimination and sensation of incomplete evacuation.¹⁻² The problem affects between 2% and 27% of the general population in Western countries.³⁻⁴ Different aspects can explain this variation in prevalence rates: the range of definitions used in research and parameters like age, different economic classes, dietary habits, socioeconomic level and the population's medical care difficulty.⁵

Fecal loss through the anal sphincter is another condition that restricts individuals' social interaction. This problem can occur due to pelvic floor and/or anal sphincter muscle alterations, fullness of the gastrointestinal tract, clinical and infectious conditions. It is estimated that between 0.5% and 5% of the general population suffer from anal incontinence.⁶

The central nervous system controls the defecation mechanism. Injuries in the brain and its connections can alter individuals' intestinal functioning. Examples of these injuries include stroke (CVA) and Traumatic Brain Injury (TBI). Factors associated with the brain injury can alter fecal peristalsis and elimination. Immobility, spasticity, muscle weakness, loss of independence to use the bathroom and the use of some drugs can contribute to bowel dysfunction.⁷⁻⁸ Consequently, these patients can present intestinal constipation and anal incontinence, which are considered the most common intestinal dysfunctions in this population.

In literature, there is a lack of information on intestinal dysfunction in patients with sequelae caused by CVA and TBI. The prevalence of intestinal constipation in patients with brain injury secondary to CVA ranges between 22.9% and 60%, depending on the definition used and the type of study.⁹⁻¹¹ Anal incontinence, on the other hand, can vary between 30% and 40% in the acute phase and between 9% and 15% in the chronic phase.¹² In Brazil, in one study, the prevalence of intestinal constipation was assessed in patients with sequelae caused by CVA, in which 49% of patients admitted to a rehabilitation program presented the symptoms. The prevalence of anal incontinence was not investigated in the same study.¹³ Until the present study, no prevalence study on bowel dysfunction had been undertaken in TBI patients.

The prevalence of bowel dysfunction in pa-

tients with sequelae due to CVA and TBI is higher than in the general population. Little literature has been published about bowel alterations and, in Brazil, the dimension of this problem is not very well known. These complaints are common in individuals with sequelae due to CVA and TBI and lead to constraints and quality of life problems, often hampering patients' effective return to daily and social activities.^{8,14} Getting to know the dimension of the problem in this population can contribute to further attention to these symptoms in this population, with a view to the early establishment of bowel retraining measures and, consequently, to a better quality of life for these people.

Thus, the aim of this study was to investigate the prevalence of bowel dysfunction (intestinal constipation and anal incontinence) in patients admitted for rehabilitation at a neurologic rehabilitation ward.

METHOD

This retrospective case series study was based on the analysis of electronic data charts related to hospitalizations that took place in the first semester of 2009 at a neurological rehabilitation ward, where patients are admitted for diagnostic investigation and rehabilitation. All adult patients with brain injury deriving from CVA and TBI were included, independently of the time with brain injury and neurological damage, hospitalized during the abovementioned period.

All patient admission evolutions by nurses, physicians and physiotherapists were analyzed. Based on the analysis of each patient's chart, symptoms of intestinal constipation and anal incontinence were registered, as well as the following alterations: memory disorder and communication impairment, motor problems, use of mobility aid and demographic characteristics.

The intestinal constipation symptom was defined in the presence of at least one of the following criteria: evacuation frequency less than three times per week, use of laxatives, intestinal wash and use of suppositories. These definitions had also been used in other studies.^{8-10,15}

Anal incontinence was identified through patients and/or family members' reports on the need for diaper use. Patients who were unable to inform their desire to evacuate were also considered incontinent. The presence or absence of cognitive impairment (memory and communication) was registered. To classify the use of mobility aids, the aid used more frequently was considered. Motor prob-

lems were classified according to the professionals' evaluations, as follows: tetraplegia, tetraparesis, hemiplegia, hemiparesis and no motor problem.

Besides calculating bowel dysfunction prevalence rates, the relation between intestinal constipation and anal incontinence and the following variables was assessed: memory disorder, communication impairment, motor problem, use of mobility aid, age and gender.

Data were collected directly from the electronic file and stored in a Microsoft Access 2003 database.

Descriptive and inferential analyses were developed. For the inferential analysis, interval estimates were used, with a 95% confidence level. The relation between the prevalence rates of intestinal constipation and anal incontinence and the clinical and sociodemographic variables was assessed with the help of the Chi-square test, with significance set at 5%.¹⁷ SPSS 13.0 was used for statistical analyses.

The project received previous approval from the research ethics committee at the institution, approval letter 754.

RESULTS

In the first semester of 2009, 138 patients were hospitalized in the neurologic rehabilitation program, 72 (52%) of whom were diagnosed with brain injury due to a stroke. As observed in table 1, patients with ischemic injuries were predominant. The mean age in the total patient group was 46.6 years (standard deviation=18.4 years). In the group of patients with brain injury due to a stroke, the mean age was 59.4 years (standard deviation=13.9 years), higher than the mean age in the group with TBI (32.7 years; standard deviation=11.9 years). The mean time with the brain injury in the sample was 4.6 years (standard deviation=5.2 years). In table 1, the clinical sample characteristics are displayed.

Table 1 - General characteristics of patients hospitalized in a rehabilitation program, Brasília, DF, January till July 2009 (n=138)

Characteristics	CVA (n=72)	TBI (n=66)	Total (n=138)
Type of injury			
Hemorrhagic	16 (22%)	-	16 (12%)
Ischemic	56 (78%)	-	56 (41%)
Gender			
Female	39 (54%)	15 (23%)	54 (39%)
Male	33 (46%)	51 (77%)	84 (61%)
Motor problem			
Hemiparesis	50 (69%)	24 (36%)	74 (54%)
Tetraparesis	7 (10%)	36 (55%)	43 (31%)
Hemiplegia	13 (18%)	1 (2%)	14 (10%)
Others	1 (1%)	1 (2%)	2 (1%)
None	1 (1%)	4 (6%)	5 (4%)
Mobility aid			
Walker/Cane	19 (26%)	15 (23%)	34 (25%)
Wheelchair	36 (50%)	35 (54%)	71 (52%)
Walks without help	17 (24%)	15 (23%)	32 (23%)
Memory Disorder			
Yes	40 (56%)	29 (44%)	69 (50%)
No	32 (44%)	37 (56%)	69 (50%)
Communication Impairment			
Yes	41 (57%)	35 (53%)	76 (55%)
No	31 (43%)	31 (47%)	62 (45%)
Use of laxatives			
Yes	13 (18%)	12 (18%)	25 (18%)
No	59 (82%)	54 (82%)	113 (82%)
Anal incontinence			
Yes	13 (18%)	20 (30%)	33 (24%)
No	59 (82%)	46 (70%)	105 (76%)
Intestinal constipation			
Yes	21 (29%)	16 (24%)	37 (27%)
No	51 (71%)	50 (76%)	101 (73%)

The prevalence of anal incontinence equaled 24% (95% confidence interval: 17% - 31%) and the prevalence of intestinal constipation 27% (95% confidence interval: 16% - 37%). Considering the occurrence of intestinal constipation and/or anal incontinence as bowel dysfunction, the prevalence of bowel dysfunction corresponded to 41% (95% confidence interval: 29% - 53%). According to

table 2, no statistically significant difference was found between stroke and traumatic brain injury patients, neither with regard to the prevalence of anal incontinence nor intestinal constipation.

The mean time with the injury among constipated patients equaled 4.3 years (standard deviation=5 years) and among incontinent patients 3.9 years (standard deviation=4 years).

Table 2 - Sample characteristics according to the presence of the bowel dysfunctions Anal Incontinence (AI) and Intestinal Constipation (IC). Brasília, DF, January till July 2009 (n=70)

Characteristics	Prevalence of AI	p value	Prevalence of IC	p value
Type of injury				
Stroke	13 (18%)	0.092	21 (29%)	0.567
TBI	20 (30%)		16 (24%)	
Gender				
Female	14 (26%)	0.657	12 (22%)	0.329
Male	19 (23%)		25 (30%)	
Motor problems				
Hemiparesis	6 (8%)	0.000*	19 (26%)	0.513*
Tetraparesis	20 (47%)		14 (33%)	
Hemiplegia	6 (43%)		3 (21%)	
Others	1 (50%)		1 (1%)	
None	- -		-	
Mobility aid				
Walker/Cane	1 (3%)	0.000	9 (27%)	0.079
Wheelchair	32 (45%)		24 (34%)	
Walks without help	0 (0%)		4 (13%)	
Memory Disorder				
Yes	25 (36%)	0.001	22 (32%)	0.179
No	8 (12%)		15 (22%)	
Communication Impairment				
Yes	22 (36%)	0.004	19 (31%)	0.359
No	11 (15%)		18 (24%)	
Use of laxatives				
Yes	9 (36%)	0.117	24 (96%)	0.000
No	24 (21%)		13 (12%)	

* Fisher's (exact) chi-square.

Also regarding table 2, anal incontinence was associated with motor problems, use of mobility aid, memory disorder and communication impairment. No association was found between bowel dysfunction and gender, age and injury type.

DISCUSSION

In this study, bowel dysfunction was defined based on the presence of intestinal constipation and/or anal incontinence. Forty-one percent of patients with bowel dysfunction were identified, 27% of whom suffered from intestinal constipation and 24% from anal incontinence.

In the results of a national chronic constipation audit developed in the United States, 75% of cases affected older people and 58% patients with neurological changes.¹⁷ In the present study, the prevalence of intestinal constipation was lower than in the study cited above, although it can vary according to definitions used in the studies.⁵ It is important to mention that, in this study, cases of patients with stroke and TBI were evaluated, as opposed to the earlier study, in which other neurologic conditions were also evaluated.

In other studies in the general population, undertaken in Latin America, intestinal constipa-

tion is more common in women.² In the present study, this condition was more frequent among men. This can be explained by the fact that this sample contains far more men than women, although no statistical significance between these variables was found.

In this study, the mean age among constipated patients was lower than in similar studies, which can be justified by the presence of patients with brain injury due to TBI, who tend to be younger. Similar results were found in a study of patients after stroke, TBI and other brain injuries, in which the TBI population was significantly younger and predominantly male.¹⁸ The mean age of patients with brain injury due to stroke and the prevalence of intestinal constipation do not differ from the results found in another study in which 140 stroke patients were involved, in which it was verified that intestinal constipation affected 22.9% of patients and was the main complication after the stroke.¹⁰

In another study, undertaken to evaluate the presence of bowel dysfunction after stroke, intestinal constipation appeared as a frequent condition that affected 30% of patients, while anal incontinence occurred in 5.5% of stroke patients.⁹

Thus, in the literature, the prevalence of intestinal constipation in patients suffering from stroke sequelae can range between 22.9% a 60%, although different definitions and research phases are identified in the studies. In some cases, prevalence rates were investigated in more acute patients or after a recent injury^{10-11,19} and in others with chronic patients.^{9,13} In the present study, this difference can be justified by the method – retrospective analysis of electronic patient chart – and the consequent impossibility to investigate other intestinal constipation symptoms. In another prospective study in which a standardized instrument was used, developed in Brazil,¹³ this prevalence was higher, which underlines differences in study designs according to the definitions of intestinal constipation adopted.

The stroke can result in paresis and speech alterations, besides cognitive impairment, object agnosia, visual-spatial disorientation, attention deficits, which can compromise evacuation at socially acceptable times and places, and also in intestinal constipation.²⁰ In this study, it was observed that memory disorder and communication impairment were variables that were statistically associated with anal incontinence.

A stroke can affect all aspects of personal life and enhance risk factors for bowel problems like:

reduced physical mobility; decreased fluid intake, as the individual can present difficulties to swallow and reach fluids or reduce fluid intake in the attempt to control urinary incontinence; reduced fiber intake, due to swallowing difficulties; dependence on others to use the bathroom; reduction or absence of feeling the need to defecate; cognitive impairment and use of medicines that can affect the bowel function.²¹

Bowel dysfunction is a common and anguishing condition after a stroke, but there are practically no intervention studies in this clinical area.⁸ Another aspect is that intestinal constipation in hemiplegic patients probably happens through a double mechanism. On the one hand, the neurological disorders leading to urinary and anal-rectal sphincter disorders. On the other, the general consequences of hemiplegia, including dependence, modification of dietary regimen and defecation conditions. Constipation is acknowledged as a severe problem in clinical practice and can affect up to 60% of this population in rehabilitation centers.¹⁵

As for anal incontinence, a study undertaken in the United States, in a sample of 1,013 TBI patients, revealed that 68% of patients suffered from fecal incontinence during hospitalization.¹⁴ This data is higher than the present findings though. This may be related to the way data were collected, as anal incontinence was identified through diaper use and patients' lack of request to evacuate in an appropriate place, according to a relative or the patient's own report during hospitalization. Another aspect is the fact that the sample in the above mentioned study included more patients with neurological injuries. Another important factor that should be taken into account in data analysis is patients' time with the brain injury.

Regarding mobility aid and motor problems, according to the literature, immobility can be a risk factor for intestinal constipation, as it leads to deconditioning, which results in an inappropriate abdominal press strength for defecation,²⁰ so that physical mobility plays an important role in bowel dynamics.¹⁰ In this study, no association was found between wheelchair use, motor problems and intestinal constipation. What anal incontinence is observed, on the other hand, this association was observed and one of the hypotheses is patients' difficulty to get access to the bathroom, besides the presence of cognitive impairment. The extent of the brain injury can result in greater cognitive and motor problems, which could not be measured in this study. These factors are closely related with indi-

viduals' intestinal function, as they change self-care for toilet use and also cause anal incontinence.^{8,14}

CONCLUSIONS

The present study results indicate that, in patients with brain injury due to stroke and TBI, bowel dysfunction is frequent, especially in patients with motor, communication impairment and memory disorder.

Getting to know the prevalence of bowel dysfunction and some associated factors underlines how important it is for the rehabilitation team, especially the nursing team, to pay attention to bowel dysfunctions. Identifying these patients early and establishing a therapeutic approach for patients themselves and relatives/caregivers to better manage their bowel function can contribute to a better quality life of life and to the possibility of social reinsertion.

One limitation to this study is the fact that no standardized definition was used for intestinal constipation and anal incontinence. Data were collected directly from the electronic chart, based on records of patients/relatives' reports. Therefore, the method used can interfere, considering that records in the patient charts upon admission is based on self-referred information by the patient and relative, often underestimated. Also, sometimes, intestinal constipation is only identified after the patient's hospitalization. Regarding this information, it is observed in practice that, when admitted, patients in rehabilitation programs mainly focus on motor aspects and many of them forget to inform about bowel symptoms.

This study was valid to provide information about the prevalence of bowel dysfunction when patients are admitted for rehabilitation, besides some possibly associated factors. Further studies can compare this prevalence upon admission with prevalence rates identified during the rehabilitation program, besides evaluating other factors that can be associated with bowel dysfunction, using standardized instruments.

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