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Intestinal constipation in the elderly and associated factors – SABE Study

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Sâmia Gomes[a],*, *Yeda Aparecida de Oliveira Duarte*[b], *Jair Licio Ferreira Santos*[c]

[a] *Universidade de São Paulo (USP), Faculdade de Saúde Pública (FSP), São Paulo, SP, Brazil*
[b] *Universidade de São Paulo (USP), Escola de Enfermagem (EE), Departamento de Enfermagem Médica-Cirúrgica, São Paulo, SP, Brazil*
[c] *Universidade de São Paulo (USP), Faculdade de Medicina de Ribeirão Preto (FMRP), Ribeirão Preto, SP, Brazil*

A R T I C L E I N F O

A B S T R A C T

Introduction: Constipation is understood to be a chronic problem related to a multi-functional disorder that affects approximately 20% of the world population, and it is more prevalent in women and in the elderly.

Objective: To measure the prevalence of intestinal constipation in elderly people living in São Paulo, as well as the factors associated with this condition.

Methods: This was a cross-sectional study using the SABE study database (Health, Well-being and Ageing) from 2010 with a probabilistic sample of 1345 elderly people (≥ 60 years) living in São Paulo city, both male and female. Logistic regression was used to identify factors associated with intestinal constipation.

Results and conclusion: The prevalence of intestinal constipation in older people is 14.23%. The associated factors were joint pain, osteoporosis, and use of laxatives; in women, associated factors were antidepressants and diuretics.

Constipação intestinal em idosos e fatores associados – Estudo SABE

R E S U M O

Introdução: Constipação é compreendida como um problema crônico relacionado a uma desordem multifuncional que afeta cerca de 20% da população mundial, sendo mais prevalente em mulheres e em idosos.

Objetivos: Verificar a prevalência de constipação intestinal em idosos residentes no município de São Paulo e seus os fatores associados.

Métodos: Trata-se de um estudo transversal que utilizou a base de dados do Estudo SABE (Saúde, Bem estar e Envelhecimento) do ano de 2010 com uma amostra probabilística de 1345 idosos (≥ 60 anos) de ambos os sexos, residentes no município de São Paulo. A regressão logística foi utilizada para identificar os fatores associados à constipação intestinal.

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* Corresponding author.
 E-mail: samia.gomes@usp.br (S. Gomes).

Resultados e conclusão: Prevalência de constipação intestinal em pessoas idosas é de 14,23%. Os fatores associados encontrados foram dor articular, osteoporose, uso de laxativos e, em mulheres, antidepressivos e diuréticos.

Introduction

Constipation is a chronic, multifunctional problem that affects approximately 20% of the total worldwide population, and it is more prevalent in women and the elderly.[1,2] Its incidence varies from 7.72% to 42.86% in individuals older than 70 years.[3]

Constipation is defined by the presence of specific criteria 3 months out of the year, including effort needed in >25% of the evacuations; lumpy or hard stools; sensation of incomplete evacuation in >25% of evacuations; sensation of rectal obstruction/blockage of the stools in >25% of evacuations; manual manoeuvring in >25% of evacuations; less than three evacuations per week; and rare soft stools without the use of laxatives.[4]

Constipation may be related to factors such as intestinal transit disorders and evacuation disorders.[1]

Some factors frequently associated with IC are ageing, inactivity, low caloric intake, and use of medications. It may be associated with other causes such as obstruction, neuropathies, endocrine changes, gastrointestinal tract disorders, eating disorders, and medications.[1]

Objective

To verify the factors associated with constipation in the elderly in the city of São Paulo.

Method

This work is part of the SABE Study (Health, Welfare and Ageing). It is a cross-sectional, retrospective, quantitative study, conducted via a population survey for the year 2010.

SABE study

It is a multicentre study that began in 2000 via a population-based survey, aiming to develop a profile of the elderly population of the urban centres in Latin America and the Caribbean. In Brazil, this study became longitudinal, and new surveys were carried out in the years 2006 and 2010. This article uses the database for the year 2010, with a population sample of 1345 elderly individuals.

Ethical aspects

The SABE Study had the approval of the Ethics Committee in Research of the School of Public Health, University of São Paulo (COEP 196/96), research protocol n° 2044. All participants signed an informed consent form.

Study variables

Variable of interest

The dependent variable of the study was the presence of constipation (Yes/No). These data were taken from observations resulting from the following question: "How often, when you wanted to evacuate, did you have difficulty or could not do it?"

The elderly were classified according to the report of progressive difficulty to evacuate, following the criteria of the Rome Consensus III.[4]

Control variable

The variables classified as controls were gender (male/female) and age (60–69 years, 70–79 years, and 80 or more years).

Independent variables

The independent variables are represented by the possible factors associated with IC. They were distributed into groups.

Socio-demographic conditions (gender, schooling, age) age (60–69 years, 70–79 years, 80 or more years).

Habits (water intake, whole milk, sausage, and vigorous physical activity).

Water intake for this study was considered the number of glasses drunk per day. In this study, consumption of less than or equal to 5 glasses was inadequate consumption (no), and consumption greater than 5 glasses was adequate (yes); consumption of whole milk was categorized as the frequency at which it was drunk: milk intake (no), consumption 1–6 times per week (low consumption), consumption once a day (moderate), and consumption 2–3 times per day (high). Sausage consumption was defined as yes or no; vigorous activity was defined as work and as aerobic physical activity (running or playing sports) for at least 75 min per week. In this study, the time reported by the elderly for the practice of vigorous activity was verified and considered as either yes or no (Table 1).

Medications (polypharmacy, opioid, laxative, diuretic, antidepressant)

Polypharmacy is characterized by the taking of five medications or more: five or more (yes); taking of 0–4 (no); opioid (yes/no); laxative (yes/no); diuretic (yes/no); antidepressant (yes/no).

Health problems (osteoporosis, cancer, joint pain)

We considered the presence or absence of the following pathologies: osteoporosis (yes/no); cancer (yes/no); and joint pain (yes/no).

Table 1 – Analysis of multiple logistic regression, adjusted for gender.

Variable	Male OR (95% CI)	Female OR (95% CI)
Joint pain	1.80 (0.94–3.45)	2.29 (1.42–3.69)[a]
Osteoporosis	0.97 (0.20–4.67)	2.19 (1.36–3.52)[a]
Laxative	5.39 (2.66–10.92)[a]	4.42 (2.71–7.19)[a]
Antidepressant	1.15 (0.25–5.31)	1.96 (1.12–3.44)[a]
Vigorous activity	0.66 (0.20–2.15)	2.48 (1.52–4.04)[a]
Diuretic	1.12 (0.49–2.53)	1.81 (1.16–2.83)[a]
Whole milk (glasses)		
1–6/week	0.24 (0.07–0.83)[a]	1.11 (0.50–2.48)
1 per day	0.33 (0.12–0.86)[a]	0.67 (0.33–1.37)
2–3 times/day	1.47 (0.62–3.46)	2.02 (1.00–4.18)[a]
Schooling (in years)		
1–3 years	1.54 (0.42–5.68)	2.77 (1.30–5.91)[a]
4–7 years	2.04 (0.57–7.26)	2.42 (1.27–4.62)[a]
8 years or more	1.69 (0.46–6.18)	2.87 (1.36–6.05)[a]

Source: SABE Study, 2010. Hosmer–Lemeshow goodness-of-fit: $p = 0.73$.

95% CI, Confidence Interval 95%.

[a] *p*-Value < 0.05, Wald test. Weighted sample.

Statistical analysis

To describe the socio-demographic and health status profiles of the elderly who reported constipation in 2010, simple frequency measurements and univariate analyses were performed using the Rao Scott test (for complex samples). To study the factors associated with constipation, the variables with $p < 0.20$ in the univariate analysis were included in the logistic model to test for significant interactions that produced greater decreases in deviance and create a better adjusted model (Table 2).

The model results were presented according to the Odds Ratios (OR) and the respective 95% Confidence Intervals (95% CI).

The multiple logistic regression model was applied to verify the association between variables that could possibly explain intestinal constipation in the elderly. The multiple analyses were adjusted for age and gender in order to describe the differences between the main groups.

The variables that presented a *p*-value < 0.05 in the multiple regression model remained in the final model. The remaining variables were excluded from the analysis.

Finally, residue analysis and model adjustment were verified through the Hosmer and Lemeshow test.

The software used for analysis of the study was Stata 12.0.

Results

For males, a relationship with IC was present for laxative consumption: low intake of whole milk was a protective factor (OR = 0.24). For females, an IC association was found for the variables osteoporosis (OR = 2.19), laxative (OR = 4.42), antidepressant (OR = 1.96), and diuretic (OR = 1.81). Increased milk consumption was shown to be a risk factor (OR = 2.02).

The joint pain variable for the 60–69 year-old group showed a 3.52 times greater chance of being associated with IC than for the group that reported an absence of pain. The 80 years and older group presented a risk factor for IC that was 2.66 times greater than that for the elderly without joint pain. The presence of osteoporosis for the age group of 70–79 years was approximately 2.57 times more associated with IC than the absence of osteoporosis. Women with osteoporosis presented a 2.19 times greater chance of IC when compared with elderly women who did not present this pathology. The use of laxatives among elderly individuals aged 80 years or older gave an OR of compared with those who did not use this medication,

Table 2 – Analysis of multiple logistic regressions adjusted by age group.

Variable	60–69 years OR (95% CI)	70–79 years OR (95% CI)	80 or + OR (95% CI)
Joint pain	3.52 (1.95–6.49)[a]	1.27 (0.62–2.59)	2.66 (1.08–6.52)[a]
Osteoporosis	1.97 (1.08–3.58)[a]	2.57 (1.11–5.95)[a]	2.04 (0.86–4.86)
Laxative	4.58 (2.08–10.10)[a]	3.84 (2.03–7.24)[a]	8.26 (4.19–16.31)[a]
Vigorous activity	2.20 (1.18–4.09)[a]	1.63 (0.63–4.19)	0.84 (0.21–3.34)
Sausages	0.58 (0.31–1.08)	1.01 (0.53–1.92)	0.48 (0.23–0.99)[a]
Gender	1.29 (0.68–2.46)	0.33 (0.16–0.67)[a]	0.71 (0.26–1.92)
Whole milk (glasses)			
1–6/week	0.72 (0.29–1.78)	0.71 (0.25–2.04)	0.47 (0.11–2.07)
1 per day	0.43 (0.15–1.20)	0.57 (0.24–1.35)	0.59 (0.25–1.41)
2–3 times/day	1.47 (0.59–3.61)	2.29 (1.01–5.20)[a]	1.53 (0.64–3.63)
Schooling (in years)			
1–3 years	3.54 (1.06–11.74)[a]	2.09 (0.57–7.62)	2.64 (0.76–9.11)
4–7 years	5.11 (1.58–16.52)[a]	1.28 (0.39–4.15)	2.73 (1.00–7.46)[a]
8 years or more	4.63 (1.56–13.79)[a]	1.98 (0.54–7.24)	0.90 (0.20–3.92)

Source: SABE Study, 2010. Hosmer–Lemeshow goodness-of-fit: $p = 0.71$.

95% CI, Confidence Interval 95%.

[a] *p*-Value < 0.05; Wald test. Weighted sample.

and it was more prevalent in men (OR = 5.39). Antidepressants were prevalent in females, with an OR of 1.96. The consumption of foods for the elderly 80 years old or older was 52% less likely to be affected by IC. The use of diuretics by women showed an association with IC (OR = 1.81, 95% CI 1.16–2.83). For males, milk consumption 1–6 times per week was a protective factor for IC (OR = 0.24). For females, the OR for milk was 2.02 with consumption 2–3 times per day. For the elderly 80 years or older, with 4–7 years of schooling, the OR was 2.73. For 60–69 years with 4–7 years of schooling, the OR was 5.11. For the elderly women with 1–3 years of schooling, the odds of presenting with IC are 2.77 times greater than for those without schooling. For those with 4–7 years of schooling, the OR was 2.42.

Discussion

The prevalence of IC in the elderly in this study was 14.23%. The prevalence of global IC was 20%.[1] In Londrina, the prevalence of IC in adults was 14.60% (95% CI 13.10–16.10).[5] In general, the prevalence of IC and its associated factors is more frequently observed in females.[6] The association with IC was found in the elderly with chronic diseases, cancer, opioid use, and lack of fluids influencing faecal cake strength.[7] Data from a national study on the increased prevalence of constipation in the elderly showed that the prevalence of IH was greater in females, representing 89.2% of the analyzed sample of constipated individuals, and in the elderly 80 years old or older, females constituted 67.6%.[8] In this study, IC for females was associated with joint pain, osteoporosis, laxative use, antidepressant use, diuretic use, milk consumption, and schooling. For males, it was associated with the use of laxatives and milk consumption.

Joint pain

Joint pain is cited as one of the factors associated with IC.[9] The multivariate analysis in this study showed that people between 60 and 69 years of age with joint pain had a 3.52 times greater chance of developing IC than those that reported an absence of pain (*p* < 0.00; 95% CI 1.95–6.49). The 80 years and older group with joint pain had a risk factor for IC that was 2.66 times greater than that for those without joint pain. Females had an OR of 2.29 (95% CI 1.42–3.69).

Osteoporosis

IC may be associated with calcium supplementation due to osteoporosis.[10] In this study, in the age group of 70–79 years, those with osteoporosis had a high risk of association with IC, approximately 2.57 times greater than that for the elderly without osteoporosis (*p* < 0.02; 95% CI 1.11–5.94). In women, there was a 2.19 times greater chance of IC in those with osteoporosis compared to elderly women who did not present with this pathology.

Laxatives

The use of laxatives was significant for the age group of 80 years or older (OR = 8.26) and was mainly found in males

(OR = 5.39). In the SABE study, the most commonly found laxatives belong to the intestinal mucosa stimulant/irritant group, which tends to cause rapid onset peristalsis. However, chronic use can cause lesions in the nerve endings of the colon and gradually lead to greater slowness, requiring more and more laxatives. This excessive consumption may conceal pre-existing diseases.[11,12]

Antidepressants

The use of antidepressants by the female group had a significant association with the presence of IC (OR = 1.96; 95% CI 1.12–3.44). Antidepressants have cholinergic effects that are potentially constipating.[13,14] In a clinical trial, antidepressants such as citalopram had an RR of 1.78 (95% CI 1.47–2.16); for Bupropion, there was an RR of 1.81; for Sertraline, there was an RR of 1.50; and for Venlafaxine, there was an RR of 2.01.[15]

Vigorous activity

Vigorous activity presented an OR of 2.48 times for females, seen especially in the age group of 60–69 years. In this case, we should consider that the survey may present bias in the responses of the elderly, despite they are being an explanation regarding what constitutes vigorous activity. We must take into consideration that many of them considered any daily activity to be vigorous activity. The result is peculiar to this population sample with possible associated factors that were not taken into account in the study.

Built-in food

The group of individuals 80 years or older who consume sausage were 52% less likely to be affected by intestinal constipation compared with the elderly of the same age group who do not consume sausage. We consider these elderly people to have a lower risk of developing IC than those that do not consume sausage, which causes us to speculate about the possible relationships between IC and sausage consumption. One can consider some possible explanations for the inverse relationship in this case. Low consumption of this type of food may be associated with healthy eating habits, possibly for the treatment of health problems. In addition, because sausage is a high-fat food, it may lead to diarrhoea in the elderly, giving rise to an inverse relationship between consumption and IC. Finally, we may consider that the consumption of sausage can represent another associated variable, such as income, considering that the cost of this type of food may select the group of elderly that consumes it, possibly biasing towards elderly people who also have better access to healthy food, to physical activities, and to drugs that favour intestinal functioning.

Sex

IC was predominant in females, with 16.82% of the women reporting constipation, the majority of the constipated elderly in the SABE.[16]

Diuretics

Women who used diuretics presented an OR of 1.81 compared with women who did not use diuretic medications (95% CI 1.16–2.83), which is reaffirmed by the American Gastroenterology Association.[17]

Whole milk

Whole milk has a protein component called casein. Caesins form components called micelles, which contain a large amount of water and calcium and, in excess, can be constipating.[18,19] In this study, the consumption of whole milk 2–3 times per day presented a greater risk of IC than did other volumes consumed. The age group of 70–79 years was positively associated with IC, with an 2.29 times greater chance. For males, consumption of milk 1–6 times per week was a protective factor (OR = 0.24). The consumption of milk once per day was shown to be a protection factor, with a chance of 0.33, demonstrating that this level of milk consumption corresponds to a frequency of 57% fewer cases of IQ when compared with non-consumption. For females, milk consumption 2–3 times per day presented an OR of 2.02. We believe that excess milk consumption presents a higher chance of IC in females when compared with women who do not consume whole milk.

Years of schooling

The elderly of 80 years old or older who had 4–7 years of schooling had an OR of 2.73 when compared with the elderly of this same age group without schooling. For the age group of 60–69 years, we found that all schooling levels presented statistical significance when associated with IQ. For the group that had 4–7 years of schooling, the OR was 5.11. Individuals with 8 years of schooling or more had an OR of 4.63. Finally, the group with schooling of 1–3 years showed a 3.54 times greater chance of having IC when compared with the elderly of the same age group that did not have schooling. For the elderly with 1–3 years of schooling, the odds ratio for IC was 2.77. For the elderly with 4–7 years of schooling, this chance was reduced to OR = 2.42. This suggests that a lower educational level correlates with a lower chance of intestinal constipation. We can consider that the schooling level influenced the condition of income, leading us to consider that access to varied medications, physical activities, consultations, and information regarding diseases and treatments was greater for individuals with higher levels of schooling compared to lower levels given their income status.[16]

Conclusion

IC can be a diagnosis or an organic dysfunction. It may be associated with intrinsic factors related to the advancement of age or to extrinsic factors such as life habits, eating, levels of activity, and medications.

The elderly in the SABE study showed an intestinal constipation prevalence of 14.23%. The multivariate regression analysis showed a significant association between socio-demographic factors related to age and schooling, showing a higher prevalence in the age group of 60–69 years old with schooling of 4–7 years. In the analysis of medication consumption, there was a greater prevalence of IC in the elderly of 80 years old or older who used laxatives; for the elderly, the most prevalent medications were antidepressants and polypharmacy.

Joint pain was a risk factor for women aged 60–69 years. Osteoporosis was prevalent in women aged 70–79 years.

Sausage consumption gave was associated with 52% less risk of IC for women aged 80 years or older. Low intake of whole milk appeared to be a protective factor against the potential risk of IC for men, and high consumption was a risk factor for women aged 70–79 years.

Conflicts of interest

The authors declare no conflicts of interest.

Acknowledgements

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