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Urinary leakage is frequent in outpatient chronic obstructive pulmonary disease (COPD) patients

A perda urinária é frequente em pacientes com Doença Pulmonar Obstrutiva Crônica (DPOC) atendidos ambulatorialmente

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RESUMO | INTRODUÇÃO: A incontinência urinária (IU) é definida como qualquer perda involuntária de urina, sendo a tosse um fator de risco. A tosse é um sintoma frequente da Doença Pulmonar Obstrutiva Crônica (DPOC) podendo associar-se com a IU. Objetivo: Avaliar a frequência de perda urinária e o impacto da IU na qualidade de vida das pessoas com DPOC e caracterizar a presença de tosse. **MATERIAL E MÉTODOS:** Tratou-se de um estudo descritivo, realizado em pessoas com DPOC. A coleta dos dados foi realizada no Departamento de Ciências da Vida II/UNEB. Aplicou-se o *International Consultation Incontinence Short-Form* (ICIQ-SF) para avaliar a frequência de perda urinária e o *King's Health Questionnaire* (KHQ) para o impacto na qualidade de vida. Os dados foram analisados no software SPSS (v.22.0), descritos em medida de tendência central, dispersão e proporções. Um $p < 0,05$ foi considerado estatisticamente significante. **RESULTADOS:** Das 30 pessoas avaliadas, a média da idade foi 66,7± 8,6 anos; desses 11 (36,7%) apresentaram queixa de IU, sendo sete (63,3%) mulheres. Entre esses a média de pontuação do ICIQ-SF foi de 5,9± 4,4. Vinte e oito participantes (93,3%) tinham tosse crônica. Analisando o KHQ, o domínio de maior impacto foi "percepção geral de saúde". **CONCLUSÃO:** A frequência de IU em pessoas com DPOC foi de 35,7% e a de tosse foi de 93,3%. Entre as pessoas com perda urinária, 36,7% referiram alguma interferência na vida diária. É importante incluir a avaliação da IU para ampliar o manejo clínico da condição de saúde dessas pessoas.

PALAVRAS-CHAVE: Incontinência urinária. Tosse. DPOC.

ABSTRACT | INTRODUCTION: Urinary incontinence (UI) is defined as any involuntary leakage of urine in which cough is a risk factor. Cough is a common symptom of chronic obstructive pulmonary disease (COPD) and may be associated with UI. **OBJECTIVE: T**o evaluate the urinary leakage frequency and the UI impact in the life's quality of people with copd and characterizing the cough presence. **MATERIAL AND METHODS:** This was a descriptive study conducted in people with COPD. Data collection was performed at the Department of Life Sciences II/UNEB. The International Consultation Incontinence Short-Form (ICIQ-SF) was applied to assess the frequency of urinary leakage and the King's Health Questionnaire (KHQ) for the impact on quality of life. Data were analyzed using SPSS software (v.22.0), described as central tendency, dispersion and proportions and $p<0.05$ was considered statistically significant. **RESULTS:** Thirty people were evaluated with the mean age 66.7±8.6 years. Eleven people (36.7%) complained of UI, seven (63.3%) were women. The average ICIQ-SSF score was 5.9±4.4. Twenty-eight participants (93.3%) had chronic cough. The domain of greatest impact of the KHQ was "general health perception". **CONCLUSION:** UI frequency in people with COPD was 35.7% and cough was 93.3%. People with leakage urinary (36,7%) reported some interference in daily life. It is important to include UI assessment to be clear the clinical management of their health status.

KEYWORDS: Urinary incontinence. Cough. COPD.

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Introduction

The International Continence Society defines urinary incontinence (UI) as any involuntary leakage of urine[1]. The prevalence of UI increases proportionally with age, thus becoming extremely common with the aging of the population, with the frequency ranging from around 30% in the 30 to 39 age group, up to about 50-60% in women from 80 to 90 years old, and in men the frequency of UI varies from 21 to 30% also increasing with age[2,3]. It is classified as stress incontinence (when there is urinary loss simultaneously with exertion, exercise, coughing or sneezing), urgency (when there is involuntary loss of urine accompanied or immediately preceded by sudden and uncontrollable urination that is difficult to postpone) or mixed (when there are signs and symptoms of both types above)[3].

Chronic obstructive pulmonary disease (COPD) has significant systemic consequences for the muscular and cardiovascular system[4]. It is a frequent, preventable and treatable disease characterized by the presence of persistent respiratory symptoms and airflow limitation due to changes in the airways or alveoli, usually produced by significant exposure to harmful particles or gases[1]. Its most frequent symptoms are chronic cough, sputum production and dyspnea on exertion, which are considered risk factors for Stress Urinary Incontinence, which, together, may contribute to the worsening of the feeling of well-being associated with the quality of life, according to a recent review article published in the literature[5].

Some studies indicate that chronic cough secondary to smoking or COPD is a risk factor for the development of urinary incontinence[1,6]. Chronic cough causes an exacerbated and constant increase in intra-abdominal pressure, resulting in mechanical overload to the pelvic organs such as the bladder. People who cough frequently may have weakened pelvic floor muscles whose function is to assist the pelvic organs and participate in the mechanism of urinary continence. Thus, the lack of strength leads to the loss of the sphincter support received from the said muscles, causing the events of urinary loss, especially on exertion, to happen[1].

It is estimated that COPD morbidity and mortality are rising in many regions, affecting an average of 210 million people, and is the fourth leading cause of death worldwide. COPD was responsible for 50,933 hospitalizations in Brazil in 2018. Due to the high number of hospitalizations, high morbidity and mortality, frequent visits to health services and lack of work, resulting in high costs for public health[7].

In 2010, the Primary Care Booklet aimed at people with chronic respiratory diseases was established by specialists, aiming at broader approaches to this population since primary care8. People with COPD could be assisted by family health teams, thus reducing the impact of the disease on their daily lives, giving them adequate conditions for the management of the disease, due to its frequent symptoms and systemic repercussions, such as urinary symptoms[8].

Given the presence of common risk factors that may contribute to a worsening of quality of life in individuals with COPD and urinary incontinence, especially as there is a scarcity of studies conducted for this reason, this study aims to verify the frequency of urinary loss in COPD patients, characterizing the frequency of cough and its impact on quality of life.

Methodology

This is a descriptive cross-sectional study conducted with people with COPD who were treated at the pneumonia outpatient clinic of a general hospital linked to the state health network in Salvador, BA. Patients diagnosed with COPD were included, with a spirometry showing a FEV_1 / FVC ratio < 0,70 after 15 minutes of use of 400 mcg inhaled salbutamol (according to the GOLD spirometer criteria)[9] and a comedy of 40 years or more both sexes. Exclusion critics were participants who did not accept respond to the research instruments. The sample was consecutive convenience. Data collection took place at the University Exercise Physiology Laboratory (UNEB). From September/2016 to June/2017.

To verify the frequency of urine loss in people with COPD, International Short Form Incontinence Consultation (ICIQ-SF)[10], validated for Portuguese,

was used to assess the impact of UI on quality of life and to qualify urinary leakage in patients both sexes. The ICIQ-SF is a set of variables that assess the frequency, severity and impact of UI, as well as a set of self-diagnosis indicators related to the causes or in various situations of UI experienced by patients. A general fact ranges from 0 to 21, the higher the score, the greater the severity of urine leakage and the impact on quality of life. Interfering leakage of interest in life at once (0) does not interfere, (1 - 3) mild, (4 - 6) moderate, (7 - 9) severe and (10) very severe or too much interference[11,12]. He also used the King's Health Questionnaire (KHQ)[13] to ask questions about the order in which tasks are organized, a perception of health, the impact of incontinence, social boundary, personal relationships such as emotions, sleep, energy and the measures of gravity. There is likewise a symptom scale that is common to all items: urinary frequency, nocturia, urgency, bladder hyperactivity, stress urinary incontinence, nocturnal enuresis, incontinence without sexual intercourse, urinary tract infections and bladder pain. There is also room to report any other bladder-related problems. KHQ is scored by each of its domains, and therefore does not have any overall score. The variable score from 0 to 100, higher than the score obtained, worse is domain-related quality of life[13].

To assess the presence of cough, we used the first question of the COPD Assessment Test (CAT) instrument, an instrument that quantifies the impact of COPD symptoms on routine clinical practice, validated for Brazil[14]. It arises out of all types, called cough, phlegm, chest tightness, shortness of breath, advantages in home activities, home safety, sleep and energy. A Medical Reseach Council (MRC) dyspnea scale also applied, which quantifies the relationship with activities of daily living[15]. Quality of life was assessed by Airway Questionnaire 20 (AQ20); It was validated for use in Brazil and consists of 20 items, rated from 0 to 20. The higher the health status assessment[16].

Data was stored and analyzed in SPSS v 22.0 software. To separate the means for the previous variables, we made use of t-test, the association and categorical variables, the chi-square test. A $p < 0.05$ was considered statistically significant. The consultation project was approved by the Research Ethics Committee of the Roberto Santos General Hospital and approved according to CAAE 48561015.4.3001.5028.

Results

Thirty individuals diagnosed with COPD were measured, 18 (60%) males and 11 (36.7%) married. The average age of people evaluated was 66.7 8.6 years, and 23 (77.7%) over 60 years old were considered elderly. Regarding BMI, 11 (36.7%) had BMI ≥25 Kg / m^2 (overweight / obesity), of these 54.5% were women. Demographic characteristics, severity of COPD according to GOLD staging, mean dyspnea (MRC), CAT, and AQ20 are set out in Table 1.

Of the 30 people, 11 (36.7%) indicated having urinary loss. Of these, seven (63.3%) were women representing 31.8% of the total study participants, and five (45.4%) had elevated BMI. Of individuals with COPD with urinary leakage, 7 (63.6%) were 60 years of age or older, and 4 (36.4%) were 60 years old. Only one (0.3%) participant underwent prostatectomy, but did not report leakage.

Of those with urinary leakage, the average ICIQ-SF score was 5.9 ± 4.4, ranging from 3 - 14 points (Table 2). Regarding the interference of urinary leakage in the daily life of people with COPD, the average score was 1.6 ± 2.8, ranging from 0 to 8. Of these seven, (63.3%) indicated no interference with daily activities. Of the individual, two (18.3%) mild interference, one (9.2%) moderate interference, and one (9.2%) severe interference or too much interference.

To assess the impact on quality of life in people with COPD and urinary loss, the KHQ was applied. The domains of greatest impact were: “general health perception”, “impact of incontinence” and “sleep and mood”; the domain with the least impact on quality of life was “Social Limitation”, as showed in Table 2. There was not any statistical difference between either KHQ domain and COPD GOLD staging.

When associating urinary loss with the degree of airflow limitation after bronchodilator (FEV_1% after BD) the spirometer values of the individuals with urinary loss, five (45.4%) had a higher severity of the disease, not being statistically significant. ($p = 0.358$).

There was not any association between cough frequency and urinary leakage in the sample studied ($p = 0.607$). There was not any statistically significant difference in CAT score, MRC dyspnea scale or AQ20

Quality of Life Questionnaire score (p = 0.323, p = 0.628 and p = 0.591, respectively). As well as, there was not any association between the frequency of urinary leakage and the distribution by gender (p = 0.063) and BMI (p = 0.354) (Table 3).

Table 1. Clinical and sociodemographic characteristics of COPD patients, Salvador, BA (n = 30).

Variables	N	%
Sex		
Male	18	60.0
Female	12	40.0
Marital status		
Married/ Stable union	11	36.7
Single/ Others	19	63.3
Severity rating (GOLD)		
A	3	10.0
B	11	36.7
C	3	10.0
D	13	43.3
Cough		
Yes	28	93.3
No	2	6.7
BMI (kg/m^2)		
<25.0	19	63.3
≥25.0	11	36.7
Variables	**Mean**	**SD**
Age (years)	66.7	8.6
FEV_1/FVC post BD	57.1	7.9
FEV_1 % predicted post BD	49.0	13.9
Dyspnea (MRC scale)	2.4	1.2
Clinical impact (CAT)	18.7	6.3
Quality of life (AQ20)	49.8	20.0

OLD: Global Initiative for Chronic Obstructive Lung Disease; FVC: Forced Vital Capacity; FEV_1: Forced Expiratory olume in the First Second; SD: Standard Deviation; BMI: body mass index; BD - bronchodilator; MRC: Medical eseach Council; CAT: COPD Assessment Test; AQ20: Airway Questionnaire 20

Table 2. ICIQ-SF and KHQ instrument scores of patients with COPD with urinary loss, Salvador, BA (n = 11)

Variables	Mean	SD	Mininum-maximum score
ICIQ-SF			
General score	5.9	4.4	3 – 14
Severity rating (GOLD)	**ICIQ-SF**	**SD**	**p**
A (n=2)	3.0	0.0	
B (n=6)	5.0	3.5	
D (n=3)	4.6	5.8	0.322
KHQ domains	**Mean**	**SD**	**Mininum-maximum score**
General health perception	72.7	23.6	25 -100
Incontinence impact	27.3	25.0	0 – 66.7
Daily life limitation	13.6	18.0	0 – 50
Emotions	13.1	21.0	0 – 66.7
Social limitation	7.1	7.5	0 – 22.2
Personal relationships	8.8	21.3	0 – 83.3
Sleep and mood	24.2	31.9	0 – 100
Severity measurements	18.0	20.0	0 – 66.7

Table 3. Association of urinary loss frequency with gender and BMI distribution, Salvador, BA

Variables	n (%)	Leakage urinary frequency (n = 11 / 36.7%)	p
Sex			
Female	12 (40%)	7 (58.3%)	
Male	18 (60%)	4 (22.2%)	0.063
BMI			
< 25 kg/m^2	19 (63.3%)	6 (31.6%)	
≥ 25 kg/m^2	11 (36.7%)	5 (45.5%)	0.354

BMI – body mass index

Discussion

In this study a significant UI frequency of 36.7% was observed in individuals with COPD evaluated. Studies suggest that the prevalence of this condition increases with age[17,18,19], a fact found in the present study where most patients with urinary loss were over 60 years old.

According to gender, 31.8% of women with COPD in the present study had urinary loss, which is lower than that found in the literature (proportion of women with urinary loss and COPD, through the 95% confidence interval ranging from 45 to 51%)[8]. Of the total number of men with COPD (18 in the study), 22.2% had urinary leakage, which is close to that reported in the literature (95% confidence interval between 25 and 33%)[6]. The characteristic of patients in the present study (patients seen at a pulmonology specialty outpatient clinic), often far from home, may, due to a sample selection bias, have removed participants with greater urinary leakage from seeking specialized care for problems of the patient. lung. In the literature, it is described that the characteristic of the place of care, usually closer to their home, helps with the greater attendance of people with more frequent or intense urinary loss[6].

A study[18] with 244 patients with COPD showed that 10% of these individuals had UI, but only two had previously complained of this condition, indicating that in men the symptoms appear on average 2.5 years after the diagnosis of COPD, highlighting the importance of including attention to complaints of urinary incontinence in the care of these patients.

Some studies indicate that these results may be influenced by cultural issues, in which older people believe that urinary loss is part of the natural aging process, not reporting their symptoms. With increasing age, bladder capacity and detrusor muscle strength decrease, involuntary contractions of the bladder musculature and post-voiding residual volume increase in both sexes. Lower urinary tract presents changes are related to aging favoring the occurrence of loss of urine. In women, urethral closure pressure and sphincter muscles change with increasing age[19]. In the present study, 63.6% of the patients were aged > 60 years and present urinary leakage, which confirms the biological plausibility of this higher proportion of urinary symptoms in this age group. These data justify the enthusiastic search for urinary leakage in patients with COPD over 60 years of age.

A high frequency of cough was found in the sample in question. According to Burge et al.[1] chronic cough is part of the symptoms that increase pelvic floor overload and can cause UI. Hrisanfow and Hagglund[20] show that both women and men with UI had a considerably higher prevalence of cough when compared to people without UI. And as for the study in question, there was no association between cough frequency and urinary loss. This finding can be attributed to the small number of the sample in this study, and for a large part of the population is classified as GOLD A and B, thus being people with lower severity of lung disease.

Regarding BMI, high values were found in women in this sample and in most individuals with urinary loss. In the study by Hrisanfow and Hagglund[21], the prevalence of UI in women was 49.6% and in men, 30.3%, both had significantly higher BMI. Excess body weight increases intraabdominal pressure during daily activities, promoting increased bladder pressure and greater urethral and bladder neck mobility. Overweight is considered a risk factor for the development and aggravation of UI[21].

With regard to only one patient reporting having undergone prostatectomy and not complaining of urinary loss, one fact may justify the absence of urinary symptoms in this patient: the most conservative type of surgery performed by the patient, since surgeries more radicals are more associated with sphincter lesions, compromising the mechanism of urinary continence[22].

In the present study, there was no association between the spirometer variables related to COPD severity and the frequency of urinary leakage, corroborating a previous study by Hirayama et al.[18] that found an inverse relationship between pulmonary function and UI frequency in men. The importance of identifying other associated conditions, such as prostate disease and history of urological surgeries, is highlighted, together with a specific evaluation for UI.

When assessing Quality of Life (QOL) using the KHQ questionnaire, it was noticed that the domains with

the highest scores were: "General Health Perception", "Impact of Incontinence", and "Sleep and Disposition". The domain with the lowest score was "Social Limitation" appearing in a greater impact on QOL, but it was not statistically significant. Similar results were found in a study by Oliveira et al.[23] that aimed to investigate the correlation of presence and UI and quality of life of elderly women in the city of Muriaé-MG. Although individuals had a reduction in COPD-related quality of life perception measured with AQ20, in the present study there was no statistical association between the AQ20 score and the KHQ or ICIQ-SF questionnaires, a fact that can be attributed to the different objectives of the study questionnaires or the sample insufficient to detect such a difference (type 2 statistical error).

The QOL of persons with UI can be affected in several ways, such as depression and anxiety that can trigger and accentuate social exclusion. Due to urinary symptoms, these people are concerned about the places they will go to, if there are toilets and are ashamed of their condition[24]. Abreu et al.[25] showed that incontinent people experience more expressive feelings of loneliness and sadness when compared to continents, varying according to the type of incontinence and the perception of the problem.

Limitations of this study can be considered, the small sample size, the characteristics of the place of care where the collection was performed, often away from the place of domicile and the omission of symptoms by patients when considering urinary loss as a natural factor of aging, and the evaluation was performed through questionnaires and no specific physical evaluation.

Conclusion

According to the observed results, we can conclude that people with COPD have a high frequency of urinary symptoms, especially in older age and in females. Urinary loss also has a high frequency of cough, a frequent symptom in COPD. Thus, it may be recommended to objectively evaluate the presence of symptoms of urinary loss in people with this disease, in order to better outline strategies aimed at early diagnosis of urinary loss and increased quality of life for these individuals.

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Author contributions

Silva CC, Santana JR, AA Camelier and Camelier FWR conceived the initial idea and planned the work. Silva CC, Santana JR, AA Camelier and Camelier FWR interpreted the final results. Silva CC, Santana JR, Silva VO, Januario PG, Oliveira, HFF, AA Camelier and Camelier FWR wrote the article. Silva CC, Santana JR, Silva VO, Januario PG, Oliveira HFF, AA Camelier and Camelier FWR reviewed successive versions and approved the final version of the article.

Competing interests

No financial, legal or political competing interests with third parties (government, commercial, private foundation, etc.) were disclosed for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.).

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