Prevalence of anal incontinence in adults and impact on quality-of-life

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SUMMARY

Objective — To investigate the prevalence of anal incontinence in the general population and in patients consulting gastroenterologist and gynecologist practices in the Rhône Alpes area.

Methods — For the first study a questionnaire was sent to a sample of 2800 people selected randomly from the electoral roll. Another study of patients selected randomly among patients attending gynecology and gastroenterology consultations was performed. A Jorge & Wexner score above or equal to 5 was used to define anal incontinence.

Results — For the first study, a total of 706 questionnaires was analyzed: the prevalence of anal incontinence was 5.1% [95% CI: 3.6-7.0] and the scores of each dimension of the SF-12 Health Survey were significantly lower among incontinent people than among continent people. The prevalence was significantly higher for women (7.5% [5.0-10.7]) than for men (2.4% [1.1-4.7]). Eighty-four physicians returned 835 valid questionnaires. The prevalence of anal incontinence was 13.1% [10.1-16.6] among patients attending gastroenterology consultations and 5.0% [3.1-7.6] among those attending gynecology consultations. For 84.8% of the incontinent patients, the physician was unaware of the patient’s disorder.

Conclusion — The prevalence figures we obtained coincide with data in the literature. This disorder is common and affects the patient's quality-of-life, but remains underestimated and under-diagnosed.

Introduction

Anal incontinence (AI) is a disabling condition with a negative social stigma which was only recently recognized as a significant clinical symptom with major impact on the patient’s quality-of-life. A recent issue of Gastroenterology [1] emphasized this point.

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Al can be defined as the inability to voluntarily retard passage of stool through the anal canal until defecation is possible in a socially acceptable time and place. A review of the recent literature [2] on studies conducted in the general population has found that the estimated prevalence of AI ranges from 1.4% to 19.6%.

In France, the only prevalence study available was conducted by Denis et al [3] in 1989 on a sample of 1 100 subjects aged over 45 years. The reported prevalence was 11% for AI and 6% for fecal incontinence.

The main objective of the present study was to evaluate the prevalence of AI among adults in the general population of the Rhône-Alpes area. Secondary objectives were to determine the frequency of associated symptoms (constipation and urinary incontinence) and to evaluate the impact on quality-of-life.
Patients and methods

The study had two complementary parts: the first was a postal survey of the general population aged over 18 years, the second a survey among patients attending gastroenterology and gynecology consultations.

The general population survey was performed during the last trimester of 2003 in the Rhône-Alpes area. An anonymous questionnaire1 (together with a stamped envelope for returning the questionnaire) was mailed to a sample population of 2,800 individuals selected from the electoral rolls using a two-level (community, individual) random selection process. Fifty-six clusters of 50 persons were randomly selected from the electoral rolls of 48 communities geographically representative of the administrative districts in the area and stratified by population density: communities with more than 20,000 inhabitants, 5,000-20,000 inhabitants and less than 5,000 inhabitants. For the analysis, the responder sample was re-stratified to match the regional gender and age distribution of the 1999 census. Items on the questionnaire were divided into four categories: individual data, history and current treatment, anal and urinary incontinence, quality-of-life. The questionnaire was self-administered.

The second survey concerned patients consulting private practitioners gastroenterologists, gynecologists-obstetricians and gynecologists and was conducted in the first semester of 2004. The practitioners were selected at random from the official list of healthcare professionals practicing in France (ADELI). Each practitioner was invited to include the first ten adult patients free of current malignant disease who accepted to participate in the study (signed consent form) irrespective of the reason for consulting. Each patient was asked to complete a questionnaire, with a section on medical history completed by the physician.

The degree of AI was measured with the incontinence scale described by Jorge and Wexner [4] based on the answers to five questions (table I) scored from 0 (normal continence) to 20 (total incontinence). A Jorge and Wexner score greater or equal to 5 was considered to define AI. An answer to all five questions was necessary to characterize the AI (missing responses were scored 0). Besides the questions on the direct impact of continence disorders on daily life activities, quality-of-life was evaluated with the SF-12® Health Survey (version 2) [5] which has scales for eight dimensions: physical functioning, pain, emotional well-being, energy, general health, mental health, physical health, social well-being. Each dimension was scored 0 to 100 (100 = maximal capacity). The French version of this American questionnaire was chosen because it is short (12 questions) and has been recognized as valid.

Statistical analysis was performed with SAS®. The 95% confidence intervals were determined with chi-square test or Fisher’s exact test for small sample size and comparisons were made with Student’s t test. Differences were considered significant for an alpha risk of 5%.

Table I. Anal incontinence scoring system according to Jorge and Wexner [4].

<table>
<thead>
<tr>
<th>Type of incontinence</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Never</td>
</tr>
<tr>
<td>Solid</td>
<td>0</td>
</tr>
<tr>
<td>Liquid</td>
<td>0</td>
</tr>
<tr>
<td>Gas</td>
<td>0</td>
</tr>
<tr>
<td>Requires pad</td>
<td>0</td>
</tr>
<tr>
<td>Lifestyle alteration</td>
<td>0</td>
</tr>
</tbody>
</table>

0 = normal continence
20 = total incontinence

Results

First part: general population survey

A total of 713 questionnaires were returned, giving a response rate of 30% of the initial sample population (after estimation of the validity of the electoral rolls1). 706 questionnaires were retained for analysis. The analyses performed on the re-stratified sample come from this population and are expressed in percentage. The characteristic features of the population are summarized in table II.

Characteristics of the re-stratified sample population

51.9% were women. Mean age was 46.5 years. The four largest age groups were: 18-29 years (21.2%), 30-39 years (19.3%), 40-49 years (18.4%), 50-59 years (15.3%).

Prevalence of AI

The Wexner score ranged from 1 to 4 for 29.5% of subjects, from 5 to 9 for 4.3% and 10 or higher for 0.8%. The prevalence of AI (Wexner score ≥ 5) was 5.1% [95CI: 3.6-7.0] [N = 36 subjects]. The prevalence of severe AI (Wexner score ≥ 10) was 0.8% [95CI: 0.2-1.6]. One hundred fourteen subjects (16%) had a Wexner score ≥ 3. Mean Wexner score was 1 ± 1.9 (range 0-18). As summarized in table III, 0.6% of responders used protective pads at least once a week and lifestyle was altered for 1.1%.

Characteristic features of the AI

Flatal incontinence was reported by 32.9%, liquid stool incontinence by 9.4% and with solid stool incontinence by 1.7% (table III). The proportions of subjects reporting at least one episode of incontinence per week were: 11.8% for flatulence, 0.7% for liquid stool and 0.4% for solid stool. Among the incontinent persons, about half (42.5%) could restrain for more than 15 minutes and 2.3% were taking medications favoring constipation.

Influence of age and gender on prevalence

The prevalence of AI in women was 7.5% [5.0-10.7] and was significantly higher than in men: 2.4% [1.1-4.7]. The percentage of incontinent women was higher in all age groups (figure 1). Incontinent people were older (mean age 51.4 years vs 46.2 years). The prevalence of AI increased with age (figure 1), but there was no significant age effect except in the highest age group (> 80 years). In this age group, the prevalence of AI was 20.5% [8.3-38.2] and was significantly higher than in the population aged less than 80 years: 4.3% [2.9-6.1].

Associated symptoms

The frequency of constipation and/or dyschezia was significantly higher in the incontinent subjects (figure 2). Difficult defecation (P = 0.006) and impression of incomplete evacuation (P < 0.0001) were significantly more frequent in incontinent subjects.

1 Available upon request
2 Because of a postal problem, all mailed questionnaires could not be recovered and counted. We estimated the mean rate of non-validated electoral enrollment (death, change of address) at the time of the study (updated according to electoral events) at about 12% for communities with more than 20,000 inhabitants, 7% for communities with 5,000-20,000 inhabitants and 3% for communities with less than 5,000 inhabitants.
The frequency of stress urinary incontinence (figure 3) was significantly higher in subjects with AI (P < 0.0001). Likewise, the frequency of urinary urge incontinence (figure 3) was significantly higher in subjects with AI (P < 0.0001). Urinary incontinence was more severe in subjects with associated AI: greater use of protective pads (P = 0.0006) and greater impact of urinary incontinence on quality-of-life (P < 0.0001) (figure 3).

**Identified Causes of AI**

No cause was identified in the large majority of incontinent subjects (70.0%). Delivery was cited as the cause by 1 out of 10 subjects.

### Table II. – Demographic data of the general population sample.

<table>
<thead>
<tr>
<th>Caractéristiques démographiques des sujets dans la population générale.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Female gender</strong> (N = 366)</td>
</tr>
<tr>
<td><strong>Mean age</strong> (N = 706)</td>
</tr>
<tr>
<td><strong>Body mass index</strong> (N = 698)</td>
</tr>
<tr>
<td><strong>History of surgery</strong> (N = 700)</td>
</tr>
<tr>
<td><strong>Proctology surgery</strong></td>
</tr>
<tr>
<td>Fistula cure</td>
</tr>
<tr>
<td>Hemorroidectomy</td>
</tr>
<tr>
<td>Fissure cure</td>
</tr>
<tr>
<td>Hysterectomy (351 women)</td>
</tr>
<tr>
<td><strong>Obstetrical history</strong></td>
</tr>
<tr>
<td>Average number of deliveries</td>
</tr>
<tr>
<td>Use of forceps</td>
</tr>
<tr>
<td><strong>Ongoing treatment</strong> (N = 706)</td>
</tr>
<tr>
<td>For diabetes</td>
</tr>
<tr>
<td>For depression</td>
</tr>
</tbody>
</table>

* total number of subjects varies depending on the number of responses to the question.

The frequency of stress urinary incontinence (figure 3) was significantly higher in subjects with AI (P < 0.0001). Likewise, the frequency of urinary urge incontinence (figure 3) was significantly higher in subjects with AI (P < 0.0001). Urinary incontinence was more severe in subjects with associated AI: greater use of protective pads (P = 0.0006) and greater impact of urinary incontinence on quality-of-life (P < 0.0001) (figure 3).

**Table III. – Frequency of flatal, liquid and solid stool incontinence, use of protective pad, and impact on quality of life in the general population.**

<table>
<thead>
<tr>
<th>Caractéristiques de la faute anale dans la population générale.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flatal</strong> incontinence</td>
</tr>
<tr>
<td><strong>Liquid stool</strong> incontinence</td>
</tr>
<tr>
<td><strong>Solid stool</strong> incontinence</td>
</tr>
<tr>
<td><strong>Use of protective pad</strong></td>
</tr>
<tr>
<td><strong>Impact on quality-of-life</strong></td>
</tr>
</tbody>
</table>

**Effect of AI on Quality-of-life**

A very large majority of the incontinent subjects (87.9%) felt that their anal symptoms, irrespective of the type, had an impact on their quality-of-life. More than one-third (36.2%) considered it had an effect on their sexual life and 40.3% wore protective dressings because of their incontinence. The score patterns on the SF-12 observed in our general population sample were similar to those observed in reference general populations, but for the incontinent subjects, scores were significantly lower in all eight dimensions compared with the continent subjects (figure 4). Differences in the average score ranged from 7.4 (mental health) to 19.5 (physical functioning). The mean score for general health was 59.5 for the incontinent subjects compared with 67.5 for the continent population.

**Second part: survey among patients attending consultations**

Among the 183 practitioners contacted for the postal survey, 123 (67.2%) agreed to participate and 84 (68.3%) returned completed questionnaires. Questionnaires from one practitioner were excluded from the analysis because of a selection bias. There were thus 83 participating physicians, 44 (53%) gastroenterologists who returned 436 questionnaires, 31 (37.3%) gynecologist-obstetricians who returned 321 questionnaires and 8 (9.6%) medical gynecologists who returned 78 questionnaires. A total of 835 questionnaires were retained for analysis.

**General characteristics**

83.4% of patients were women (100% of patients attending gynecology consultations and 68.3% of patients consulting gastroenterology consultations). Mean age of patients attending gynecology consultations was 42.2 years, most in the 30-39 (31%) and 40-49 (30%) year age groups. Mean age of patients attending gastroenterology consultations was 52.5 years, most in the 50-59 (28.7%) and 40-49 (17.6%) year age groups.

**Prevalence of AI among consulting patients**

The prevalence of AI (Wexner score > 5) in patients attending gynecology or gastroenterology consultations was 9.2% [95CI: 7.2-11.4]. The prevalence of AI (Wexner score > 5) among...
patients attending gastroenterology consultations was 13.1% [95CI: 10.1-16.6] and was significantly higher than among patients attending gynecology consultations: 5.0% [3.1-7.6] (figure 5). In all, 77 patients presented AI: 64 women and 13 men.

**Influence of Gender and Age on Prevalence of AI (figures 5 and 6)**

Among the gastroenterology patients, the prevalence of AI was 9.4% [5.1-15.6] for men and 14.8% [10.9-19.3] for women. Mean age of incontinent patients (54.6 years) was significantly higher than continent patients (46.9 years). The prevalence of AI was highest among patients aged over 60 years and was significantly higher than in patients aged less than 40 years.

**Frequency of Dyschezia and/or Constipation**

Compared with continent patients, incontinent patients reported the following symptoms more often: regular or persistent problems with defecation (28.9% vs 9.7%), regular or persistent use of laxatives (29% vs 8.9%), regular or persistent use of laxatives (19.5% vs 9.7%).

**Frequency of Associated Urinary Incontinence**

Stress- or urge-related urinary incontinence was scored “mild” or “severe” more often by patients with AI: 39.5% vs 10.9% and 41.6% vs 14.9% respectively.

**Impact on Quality-of-Life**

Patients attending consultations displayed a significantly altered quality-of-life as measured by the SF-12 score.

**Practitioner’s Awareness of the Patient’s AI**

The consulting practitioner was unaware of the patient’s AI problems for 84.8% of the incontinent patients. There was no difference in practitioner awareness between specialties.

**Discussion**

According to the results of this survey, the prevalence of AI is 5.1% in the adult general population of the Rhône-Alpes area.

We used the Jorge and Wexner score to define AI. This score is widely used and has demonstrated sensitivity. The threshold value of 5 points increases the specificity by eliminating situations with flatulence disorders with little impact on quality-of-life. This threshold can however reduce the sensitivity producing an underestimation of the prevalence of anal continence disorders or missing a few cases with incomplete responses (attribution of 0 for non-response leading to a lower total score). For the general population survey, the self-administered postal questionnaire appeared to be the best method for obtaining information on this very personal topic but might nevertheless present some risk of bias. The first would be an underestimation of prevalence by exclusion of persons in less satisfactory general health (difficult response) and institutionalized persons. It is known that the prevalence of fecal incontinence is high among elderly institutionalized persons with rates reaching 33% for example in the study by Denis et al. [3] devoted to elderly persons residing in nursing homes and hospitals. In general, studies conducted among nursing home residents, for example Nelson et al [6] and Borrie et al. [7], have reported a prevalence of AI of 47% and 46%. An overestimation of prevalence could also be possible by self-selection of patients suffering from continence disorders (greater motivation for participating in the study). This risk would be greater with a lower response rate. The 30% response rate obtained in this study is in the range generally expected for this type of anonymous survey without a reminder and cannot exclude this type of bias. However, the coherence of the results presented above, the general features of the responders (gender, age, residence) similar to those observed in the general population (except for the oldest subjects), the similar SF-12 results for the survey and general population, as well as the agreement with data in the literature on prevalence of certain variables (for example, drug treatments), suggest the studied population is representative.
ner survey, the random selection method and the high participation rate (two out of three practitioners agreed to participate, a rate higher than generally obtained) produced a study population representative of practices in the Rhône-Alpes area. The inclusion protocol and the follow-up limited the risk of patient selection.

A review of the recent literature by Macmillan et al. [2] examined 16 prevalence studies. In this review, the prevalence of AI varied from 2 to 24% with a prevalence of fecal incontinence ranging from 0.4 to 18%. This wide range in prevalence is probably explained by the variability in study methods. Population-based studies can examine very different groups of subjects: general population, specific populations of nursing home residents, post-partum patients, diabetics, etc. The definition of AI is itself variable: stool alone or also flatulence. The authors concluded that it is particularly important for all teams to establish a coherent finding since gynecology patients (generally asymptomatic) were younger than the general female population. The majority of the patient survey reporting at least one episode of liquid and/or solid matter incontinence occurred during the 12 months preceding the survey. Our results are the same: 11.2% of subjects reporting at least one episode of liquid and/or solid matter incontinence during the 12 months preceding the survey. The results reported by Lynch et al. [10] are also similar: 17% of subjects with a Jorge and Wexner score ≥ 3 (16% in our study). The only study conducted in France reported a prevalence of AI to the order of 11% and a prevalence of fecal incontinence of 6% among subjects aged over 45 years [3]. The higher prevalence of AI among women (three times higher in the general population survey in our study and 1.5 times higher in the patient survey) has been reported by others. Nelson et al. [14] reported an odds ratio of 1.51 [1.10-2.11] associated with female gender and Denis et al. [14] found that AI was more frequent among women in the general population aged over 45 years. Edwards et al. [15] found more prevalent AI among women aged over 65 years living at home in comparison with their male counterparts. Conversely, Kalantar et al. [11] demonstrated an equivalent prevalence for men and women and Johanson et al. [16] found a higher prevalence among men. The survey from Taiwan [13] was limited to women. Perry et al. [12] conducted a survey of 10,116 subjects aged over 40 years and found a prevalence of 3.3%, but only considered incontinence among subjects who experienced more than one episode per month.

Several studies have provided evidence of a higher prevalence of AI with increasing age. Nelson et al. [14] demonstrated that age over 65 years is a risk factor with an odds ratio of 3.9 [2.7-5.6]. Our results also suggest a higher prevalence in the older age groups of the general population but did not demonstrate an age effect per se. Compared with the general population, patients attending gynecology consultations had an equivalent prevalence and a significantly higher prevalence among patients attending gastroenterology consultations. This is a coherent finding since gynecology patients (generally asymptomatic, follow-up consultation, contraception, pregnancy) were younger than the general female population. The majority of the gastroenterology patients had a pathological condition, particu-
larly gastrointestinal tract diseases and were older than the general population.

In light of these prevalence figures, AI appears to be a common disorder, under diagnosed by physicians since less than one of six incontinent patients was identified by their physician. This observation raises several questions concerning the reason for the physicians’ unawareness of their patients’ conditions: patient unwilling to discuss this personal topic, problem of patient referral or orientation, practitioner’s insufficient knowledge or underestimation of the problem or, difficulty in discussing the topic, insufficient knowledge of management options. The problem of underestimation of AI is recurrent in the literature. Kalantar et al. [11] demonstrated that the primary physician did not question 14.6% of incontinent patients about anal incontinence and Johansson et al. [16] found that only one-third of patients with fecal incontinence had already discussed the problem with a physician. Faltin et al. [17] also reported that only 20% of patients with AI have discussed it with their doctor.

Our study showed that AI is strongly associated with altered quality-of-life. This emphasizes the impact of this disorder and is very much in opposition with the notion of an “ordinary” situation. Altered quality-of-life can also be measured objectively with the SF-12 which shows lower scores for all eight dimensions in incontinent subjects. However, it must be emphasized that the overall SF-12 quality-of-life score is not directly related to continence disorders and can also reveal less satisfactory general health in persons suffering from incontinence. In their study, Kalantar et al. [11] found that incontinent subjects felt their health status was less satisfactory than continent subjects. Avery et al. [18] demonstrated that subjects with urinary or anal incontinence have significantly lower quality-of-life scores for all dimensions of the SF-36.

In conclusion, the present survey confirms the high prevalence of AI. This condition is more frequent in subjects aged over 60 years but is widely encountered in all age groups. Despite the strong impact on quality-of-life, patients with AI discuss their problem very little with their physicians who themselves often miss the diagnosis. Urinary incontinence is associated with AI in 40% of subjects and dyschezia in 60%, reflecting an overall pelvic floor disorder. All of these elements contribute to late diagnosis and management of anal continence disorders. AI thus appears as an important public health problem because of:

— its prevalence,
— its impact on quality-of-life
— its under-diagnosis.

The high frequency of mixed anal and urinary incontinence points out the need for improved screening in order to organize when needed multidisciplinary management.

Improved screening and better collaboration between health care professionals should be encouraged to provide patients with better, more adapted and efficient care.

RÉFÉRENCES


