Prevalence of faecal incontinence and associated risk factors

An underdiagnosed problem in the Australian community?

Jamshid S Kalantar, Stuart Howell and Nicholas J Talley

ABSTRACT

Objective: To determine the prevalence of faecal incontinence in the community and evaluate identifiable risk factors.

Design and setting: Cross-sectional survey using a validated questionnaire. A short version of the questionnaire was sent to 220 subjects and a long version to 770 subjects, randomly selected from western Sydney, Australia.

Main outcome measures: Self-reported faecal incontinence, defined as involuntary loss of anal sphincteric control leading to unwanted release of liquid or solid faeces (not flatus) at an inappropriate time or in an inappropriate place, within the past 12 months. The long questionnaire also sought information on bowel habit and potential risk factors for faecal incontinence.

Results: The response rate was 66%. The prevalence of solid or liquid faecal incontinence was 2% and 9%, respectively. The mean age of subjects with faecal incontinence was 53 years; 55% were women. After adjusting for age and sex, there was a significant association between faecal incontinence and perianal injury ($P = 0.03$), perianal surgery ($P < 0.001$), feelings of incomplete defecation ($P < 0.0001$), loose or watery motions ($P < 0.0001$) and urgency ($P < 0.0001$). Seven of 48 subjects with faecal incontinence reported being asked by their physician about faecal incontinence and nine of 33 reported seeking medical advice for their incontinence. Subjects with faecal incontinence perceived their health to be significantly poorer than did other subjects ($P = 0.02$).

Conclusion: There is a high burden of faecal incontinence in the community, and the prevalence in men may be greater than is usually appreciated. Despite significant associated morbidity, most cases of faecal incontinence were unrecognised by doctors.

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FAECAL INCONTINENCE is a significant cause of social embarrassment and imposes a high cost on the patient and the community.[1] It can be physically and psychologically disabling, leading to progressive isolation and a devastating social impact. It is the second most common cause for institutionalisation of the elderly in the USA,[2,3] and accounts for costs of over US$400 000 000 per year for adult diapers.[4] Borrie et al estimated that the annual cost of incontinence for an institutionalised patient in Canada was C$9771.[5] Patients suffering from faecal incontinence may be reluctant to seek medical advice,[6,7] and doctors may be reluctant to ask about the condition.

Reports of the prevalence of faecal incontinence in the community have shown significant variability.[1,8-13] An accurate estimation of the magnitude of the problem in the community would help in providing knowledge of who is at greatest risk so that preventive measures can be applied. For this reason, we undertook a population-based study of the epidemiology of faecal incontinence, using a self-administered questionnaire. We aimed to ascertain the prevalence of faecal incontinence in the community sample, evaluate the health-seeking behaviour in people afflicted by faecal incontinence, determine its associated risk factors, and assess the impact of the condition on quality of life.

METHODS

This study was formally approved by the Wentworth Area Health Service's ethics committee. The samples were drawn randomly from the Lindsay electoral roll, an electoral region in western Sydney, Australia. Since voting is compulsory for all citizens 18 years and over in Australia, the Electoral Commission in each State routinely registers and updates the lists of citizens in each electorate. The population sampling frame is demographically similar to the Australian population, except that its inhabitants are slightly younger and have a slightly higher socioeconomic status.[14] The survey consisted of a self-administered questionnaire sent out to 990 residents in two stages in 1997 and 1998 (stratified for equal numbers of men and women).

Most of the questionnaire items had been previously validated in Australian and US populations.[14-16] Two forms of the questionnaire were used. A long form, consisting of 32 questions, assessed bowel habit, laxative use, presence and severity of faecal incontinence, previous suspected risk factors for faecal incontinence, health-seeking behaviour, degree of mobility, and social impact of faecal incontinence ($n = 770$ subjects). A short form, with seven questions on a single page, was a pruned version of the longer questionnaire, primarily aimed to assess the presence of faecal incontinence ($n = 220$ subjects). In the first stage, 440 questionnaires were sent out (220 short and 220 long). In the second stage, long questionnaires were mailed to a further 550 randomly selected residents. We used the two questionnaire formats to evaluate which would be optimal in achieving higher response rates (results reported elsewhere).[17]

All the mailouts included a reply-paid envelope and covering letters explaining the purpose of the study, with the investigators' contact number. The respondents were assured that their responses were confidential.

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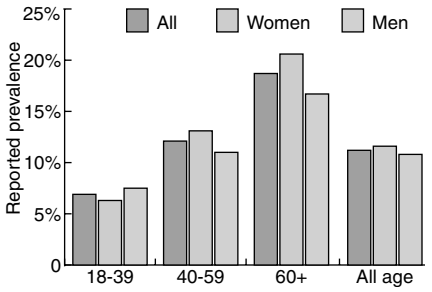
1: Prevalence of faecal incontinence according to age and sex



After the first mailout, a second mailout was sent at four weeks to those who had not returned their questionnaires. A third mailout for those who did not respond was sent out after a further six weeks. Six weeks after the third mailout we followed up non-responders by telephone if we could find their phone number. The second and third mailouts included a refusal form so that subjects could, if they wished, use the reply-paid envelope to indicate that they did not want to be contacted again.

We defined faecal incontinence as an involuntary loss of anal sphincteric control that led to unwanted release of liquid or solid faeces (not flatus) at an inappropriate time or in an inappropriate place. Symptoms were measured over the past 12 months, the standard time frame in our previously validated questionnaires.[15] Faecal incontinence related to an acute illness (eg, acute diarrhoea) was excluded. Quality of life was measured by asking about interference with social activities or lifestyle.[15] We also enquired about perceived level of health, mobility and independence.

Statistical analysis

Faecal incontinence was expressed as a dichotomous outcome variable (yes/no), and data were summarised as prevalence estimates with 95% confidence intervals (95% CI). Confidence intervals were estimated using the binomial normal distribution. Univariate associations involving faecal incontinence and categorical factors were assessed using Pearson's χ^2 statistic; those involving continuous variables (eg, age) were assessed using Student's t test. Associations between faecal incontinence risk factors and bowel habit were expressed as age-adjusted odds ratios, as estimated by logistic regression. Each factor was entered separately with age into a logistic model, using faecal incontinence as the outcome variable. Multivariate models including all potential risk factors for faecal incontinence were not calculated because of the smaller number of incontinence cases in the available subsample. An α level of 0.05 was used in all tests; all P values were two-tailed.

RESULTS

An overall response rate of 66% (651 out of 990) was achieved. The age and sex distribution of responders and non-responders was similar.

Faecal incontinence was reported by 72 of 642 responders (incomplete data for nine responders), yielding a prevalence of 11.2% (95% CI, 8.8%–13.7%). This was similar among men (31/286 [10.8%]; 95% CI, 7.2%–14.4%) and women (41/353 [11.6%]; 95% CI, 8.3%–15.0%). The prevalence of solid and liquid faecal incontinence was 2.0% (13/642; 95% CI, 0.9%–3.1%) and 9.0% (58/642; 95% CI, 6.8%–11.3%), respectively. Liquid faecal incontinence was reported by 8.8% of women (31/353; 95% CI, 5.8%–11.7%) and 9.4% of men (27/286; 95% CI, 6.1%–12.8%); solid faecal incontinence was reported by 1.1% of women (4/353; 95% CI, 0.03%–2.2%) and 3.1% of men (9/286; 95% CI, 1.1%–5.2%). The mean age of subjects with faecal incontinence was 53 years; 55% were women. Faecal incontinence was positively associated with age ($\chi^2 = 11.75$; $P = 0.003$) (Box 1).

Of the 58 people who reported liquid faecal incontinence, 37 (63.7%; 95% CI, 51.4%–76.2%) reported that they usually leaked a small amount, and 21 (36.2%; 95% CI, 23.8%–48.6%) reported that they usually leaked a moderate or large amount. Twelve of the 13 people who reported solid faecal incontinence indicated that this involved a small amount of leakage.

Twenty of 71 people reporting faecal incontinence (incomplete data for one responder) reported having one or more leakages per week (28.2%; 95% CI, 17.7%–38.6%).

Long questionnaire results

Information about bowel habit and potential risk factors was available for 477 subjects from the long questionnaire. The prevalence of faecal incontinence in this subsample was 10.3% (49/477; 95% CI, 7.5%–13.0%) and was not associated with sex (men v women: 11.8% v 9.2%; $\chi^2 = 0.88$, $P = 0.35$), but people reporting faecal incontinence were significantly older (mean age: 54 v 44 years; t 471 = 4.06; $P < 0.001$). There was a lower proportion of women with faecal incontinence in the subsample who answered the long questionnaire than in the group who answered the short questionnaire (49% v 74%; $\chi^2 = 3.97$; $P = 0.05$), but the two groups did not differ in terms of age (t 70 = 0.78; $P = 0.44$).

After adjustment for age, the risk of faecal incontinence was significantly higher among those reporting injury or

2: Age-adjusted associations between faecal incontinence and bowel habit and potential risk factors (results from long questionnaire)*

	Faecal incontinence		Odds ratio (95% confidence interval)†	*P*
	Cases	Non–cases		
Bowel habit				
Incomplete evacuation	51% (25/49)	24% (102/426)	3.72 (1.99–6.96)	< 0.0001
Loose or watery stools	46% (22/48)	14% (58/425)	4.89 (2.56–9.33)	< 0.0001
Urgency	56% (27/48)	19% (81/427)	5.57 (2.95–10.51)	< 0.0001
Straining on defecation	33% (16/49)	24% (102/426)	1.63 (0.85–3.13)	0.14
Hard or lumpy stool	35% (17/49)	27% (116/424)	1.52 (0.80–2.88)	0.19
Potential risk factors				
Fair/poor general health	33% (11/33)	13% (34/258)	2.74 (1.18–6.36)	0.02
Radiation treatment to lower abdomen or pelvis	8% (4/48)	4% (15/425)	2.72 (0.83–8.89)	0.10
Perianal injury	17% (8/46)	8% (34/426)	2.62 (1.11–6.23)	0.03
Perianal surgery	25% (12/48)	5% (22/427)	4.62 (2.05–10.40)	0.0002
Diabetes mellitus	10% (5/48)	3% (14/426)	2.07 (0.68–6.32)	0.20

*Numbers vary because of incomplete responses to the questionnaire.
†Odds ratios comparing people reporting faecal incontinence (cases) to non–cases.

surgery in the perianal area (Box 2). Faecal incontinence was not associated with radiation treatment to the lower abdomen or pelvic area or with diabetes mellitus (Box 2).

Faecal incontinence was associated with a more than a threefold increase in the odds of reporting feelings of incomplete rectal evacuation, nearly a fivefold increase in the odds of reporting loose bowel movements, and over a fivefold increase in the odds of reporting stool urgency (Box 2). Faecal incontinence was not associated with straining on defecation or with hard or lumpy stool consistency (Box 2).

The odds of reporting fair or poor health (rather than good health) were significantly higher among people reporting faecal incontinence (Box 2). Twenty of the 72 people reporting faecal incontinence (28%; 95% CI, 17.4%–38.1%) reported some interference with their lifestyle. Nine of 48 (18.8%; 95% CI, 7.7%–29.8%) reported the need to change their underpants at least weekly because of faecal incontinence. Healthcare-seeking for faecal incontinence was reported by nine of 33 cases (27.3%; 95% CI, 12.1%–42.5%); doctor-initiated discussion of faecal incontinence was reported by just seven of 48 cases (14.6%; 95% CI, 4.6%–24.6%).

DISCUSSION

This study evaluated the prevalence of faecal incontinence in a random population sample with previously validated, self-administered questionnaires. An acceptable response rate of 66% was achieved and there was no evidence of response bias. The prevalence of faecal incontinence is likely to depend on the definition applied as well as the duration and type of faecal incontinence (solid versus liquid or gas incontinence). Our definitions were easy to understand and clear. We enquired about unwanted release of faeces (excluding flatus) over a defined 12-month period, and excluded faecal incontinence related to acute illness.

Daily or weekly episodes of faecal incontinence have previously been reported to occur in about 2% of the adult population and in about 7% of healthy independent adults over the age of 65.[1,4,10] Community-based studies have shown prevalence rates of up to 16.9% in very old, independently living people.[1,8,9,11,12,18,19] In this study, the prevalence was 11.2% — higher than in some previous community-based studies,[1,8,11] but consistent with more recent studies[12,13] (Box 3). The reason for this disparity may lie with the definition used as well as the study methodology. For example, Nelson et al used a telephone interview with a member of the household that asked about the health status of other household members.[1] This

3: Community-based studies of faecal incontinence (FI)

Study	Study design	Definition of faecal incontinence	Study size (response rate)	Prevalence
Thomas et al. 1984, UK[8]	Two-part survey: (1) patients known to have FI; (2) postal survey of patients from general practitioners list	"Do you ever soil yourself?" — twice or more per month considered faecal incontinence	4844 (89%)	1.4%
Campbell et al. 1985, New Zealand[20]	Randomly selected, age-stratified, 65 years and over. Doctor-administered questionnaire at home	"Do you have any trouble controlling your water or your bowel?" [ie, within the last year]	559 (94.9%)	3.1%
Talley et al. 1992, USA[10]	Postal survey of randomised age-/sex-stratified people aged 65–93 (non-institutionalised)	Stool leakage once a week or more or if patient wore protective pads.	328 (77%)	3.7% (men, 4.5%; women, 3.1%)
Kok et al. 1992, Holland[18]	Postal survey. Randomly selected age-stratified community-residing women 60 years and over	"Occasional, involuntary loss of faeces"	719 (69%)	60–84 years, 4.2%; 85+ years, 16.9%
Drossman et al. 1993, USA[11]	Postal survey. Stratified probability, random sample of US householders selected from a database of a national marketing firm.	Not mentioned	5430 (66%)	7.8%
Nelson et al. 1995, USA[1]	State community survey using random digit dialling. Information obtained from the person in household most likely to know the health status of other residents.	"In the last year have you, or any member of the household, experienced unwanted, unexpected or embarrassing loss of control of the bowel or gas?"	6959 (2570 households) (73%)	2.2%
Nakanishi et al. 1997, Japan[19]	Random selection from age-stratified, community-dwelling people 65 years and over from urban population register .	"Do you soil yourself?"	1405 (95.4%)	men, 8.7%; women, 6.6%
Giebel et al. 1998, Germany[9]	Patients and relatives above age 18 waiting in emergency department, orthopaedic and surgical outpatient (excluding those with abdominal conditions)	Incontinence of solid, pasty or liquid faeces or flatus (individually)	500	4.8% solid stool; 6.6% pasty stool; 6.7% liquid stool; 5.5% flatus
Roberts et al. 1999, USA[12]	Postal survey of randomised community sample 50 years and over with no history of colorectal conditions	"In the previous year have you had accidents or soiling because of inability to control the passage of stool until you reach the toilet?"	778 men, 762 women (66%)	men, 11.1%; women, 15.2%
Lam et al. 1999, Australia[13]	Postal survey. Random selection from electoral roll (subjects aged 18 and over)	Positive response to at least two of the following: stool leaking, wearing a pad for faecal soiling, frequent incontinence of flatus	618 (71%)	15% (men, 20%; women, 11%)
Kalantar et al, 2002, Australia (this article)	Postal survey. Random selection from electoral roll (subjects aged 18 and over)	"Have you ever had any leakage of bowel movements (excluding flatus) at an inappropriate time or in an inappropriate place over the past 12 months"	651 (68%)	11.3% (men, 10.8%; women, 11.6%)

method potentially underestimates the prevalence of faecal incontinence. Our random population sample should more realistically represent the community prevalence.

We found that the prevalence of faecal incontinence was similar in men and women (10.8% and 11.6%, respectively). Faecal incontinence has traditionally been thought to be more common in women,[1,12,20] in part because obstetric trauma can result in unrecognised damage during childbirth. Obstetric injury to the pudendal nerve or sphincter muscle has been proposed as a primary risk factor for faecal incontinence.[21,22] Irritable bowel syndrome, which is also more common in women, may be another risk factor.[23] A few community-based studies show a higher prevalence of faecal incontinence in women,[1,12,20] but others have shown a similar or even higher prevalence in men.[8,11,13]

Other causes of faecal incontinence are thought to include anal surgery, neurological disease and previously corrected congenital anorectal malformations.[24,25] In our study, the prevalence of faecal incontinence was associated with advancing age as well as perianal surgery and injury. However, the prevalence of faecal incontinence was not significantly associated with diabetes or pelvic radiotherapy. Passage of loose or watery stool and urgency were all associated with faecal incontinence, suggesting that diarrhoea can overwhelm the mechanisms involved with maintaining continence. Feelings of incomplete rectal evacuation were also associated with incontinence, but straining was not. While feelings of incomplete defecation, possibly due to pelvic outlet obstruction, may seem to be a counterintuitive risk factor, faecal incontinence associated with faecal impaction and overflow incontinence is well described.[26] An association between constipation and faecal incontinence has also been previously shown, which may be caused by pelvic nerve damage in this group of patients.[27]

Only nine of 33 individuals with faecal incontinence reported seeking medical attention (27.3%); only seven of 48 (14.6%) reported being asked about faecal incontinence by their medical practitioner. Johanson, on surveying patients during doctor visits, reported that 34% discussed their incontinence with the doctor.[4] It is likely that patients visiting their doctors are a selected group. Enck et al have reported a systematic underestimation of faecal incontinence, finding that only 5% of patients with faecal incontinence, regardless of the underlying mechanism, had incontinence symptoms noted in the medical charts.[6] It is not clear whether the lack of acknowledgement of faecal incontinence was mainly due to the patient's failure to volunteer the information or medical practitioners' reluctance to ask about it.

Many people with incontinence may not seek medical attention owing to the embarrassment associated with this condition, but medical practitioners may be even less likely to ask about this problem. This lack of interest may be because healthcare providers feel that little can be done for these patients other than antidiarrhoeal agents and diapers. With the advent of newer treatments, including surgical techniques and biofeedback,[28] and professional awareness programs, doctors may usefully become more involved by asking directed questions about faecal incontinence.

About a third of people reporting faecal incontinence reported some interference with their lifestyle, and faecal incontinence was associated with lower levels of overall health. Whether this is a cause or effect relationship is unclear, but the data suggest that individuals afflicted by faecal incontinence face a number of problems because of the condition.

In conclusion, this study indicates that faecal incontinence is common in the Australian community. It is equally prevalent in men and women and is not confined to the elderly. It is associated with poorer health status and limits the social activities of affected individuals. Despite significant associated morbidity, faecal incontinence appears to be largely unrecognised by health care providers.

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COMPETING INTERESTS

None declared.

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