Isolated Urinary, Fecal, and Double Incontinence: Prevalence and degree of soiling in stroke survivors

Katherine R Brittain PhD¹, Sarah Perry PhD², Chris Shaw PhD², Ruth Matthews, MSc², Carol Jagger PhD², John F Potter Bmed Sci DM, FRCP³

¹Institute of Health and Society, Newcastle University, ²Department of Health Sciences, University of Leicester, ³Department of Cardiovascular Science, University of Leicester

Corresponding author: Katherine Brittain

**Address: Institute of Health and Society
21 Claremont Place
Newcastle University
Newcastle upon Tyne
NE2 4AA
England**

Fax: +44 (0) 191 222 6043

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Abstract

Objectives: To investigate the prevalence of isolated urinary and fecal, and double incontinence in community living stroke survivors and to assess the degree of soiling.

Design: Community based postal survey.

Setting: 64, 749 community dwelling residents (aged 40+) living in Leicestershire (UK) were randomly selected from the Leicestershire Health Authority register. Residents living in institutional settings were excluded.

Measurements: Respondents were asked about previous stroke, urinary and bowel symptoms, general health and demographic details including age, sex and ethnicity.

Urinary incontinence was defined as leakage several times a month or more often.

Major fecal incontinence was defined as soiling of underwear, outer clothing, furnishings or bedding several times a month or more often.

Results: A 65% response rate to the postal survey was obtained with the return of 39, 519 eligible questionnaires, with 4% (n=1483) reporting stroke. Five percent of stroke survivors reported major fecal incontinence, with 4.3% reporting both fecal and urinary incontinence and 0.8% reporting isolated fecal incontinence. Major fecal incontinence was four and a half times more prevalent in stroke survivors than the non-stroke population, and stroke survivors were also twice as likely to report soiling of furnishings or bedding. The presence of fecal incontinence in both the stroke and non-stroke population is influenced by functional limitations.

Conclusions

Fecal incontinence is common in stroke survivors and the degree of soiling can be considerable. Future research needs to explore the impact fecal incontinence can have on the lives of stroke survivors and on how it can best be managed in those living in the community.

Introduction

For people aged 60 years and over the prevalence of fecal incontinence has been reported by 7-8%(1) (2) (3), with rates increasing with age and in those living in institutional settings.(4) (5) Double incontinence (urinary and fecal) is more common than isolated fecal incontinence in older people.(5) Stroke, advancing age and poor general health have all been identified as independent risk factors for the presence of both urinary and fecal incontinence(1) (6) (7) (8) (9) (10) and it is argued that the presence of double incontinence compounds the risk of institutionalization.(7) (11).

Amongst stroke survivors both urinary and fecal incontinence are common and are associated with stroke severity and overall poor long-term prognosis.(12) Prevalence estimates for urinary incontinence range from 32-79% in the acute stage of stroke, decreasing to 25-28% at time of hospital discharge, and is still present in 12-19% of stroke survivors some months after their stroke.(13) (14) Prevalence estimates of fecal incontinence in stroke survivors are slightly lower and it is suggested that between 31-40% of stroke patients experience this on hospital admission, 18% at time of discharge and between 7-9% of stroke survivors still have problems with fecal incontinence six months after their stroke.(13) (14) (15) More recently it has been reported that 15% of stroke survivors still report fecal incontinence 3 years after their stroke and being incontinent increases the risk of long-term care placement and death.(11) This paper only investigated the prevalence of fecal incontinence in a stroke population and was unable to make comparisons with a non-stroke population. Bowel continence was characterized by the Barthel Index and defined as 'occasional accident' or 'all of the time' when questioned if they 'lose control of their bowel motions'. They were however unable to look at degree of soiling or distinguish

between monthly and yearly fecal incontinence, both of which have been identified as essential when assessing the severity of fecal incontinence (16).

There is little published research that investigates the prevalence and severity of isolated fecal and double incontinence in community dwelling stroke survivors, previous research having been focused on hospital based stroke patient populations.(15) (17) The aim of this study was to compare the prevalence of urinary, fecal and double incontinence between community dwelling stroke survivors and a non-stroke population drawn from the same community based population.

Methods

An epidemiological community based postal survey was carried out on a random sample of 64, 749 Leicestershire residents aged 40 years and over. The sample was derived from the Leicestershire Health Authority register, although residents living in institutional settings (residential homes, nursing homes, hospital settings) were excluded. The study forms part of the Leicestershire MRC Incontinence Study which assessed the prevalence and incidence of urinary and bowel symptoms in adults aged 40 years and over. Prevalence data were collected over a period of 21 months from October 1996 to July 1998 using a standardized questionnaire. Respondents were asked about previous stroke, urinary and bowel symptoms, overall general health and demographic details including age, sex and ethnicity. The postal screening question used to determine whether or not a person had ever had a stroke was that developed by O'Mahony et al and is shown to have a high degree of sensitivity (95%) and specificity (96%).(18)

Both urinary and fecal incontinence were defined as leakage several times a month or more often. Previous research on fecal incontinence, not specific to stroke, have used a variety of indicators in order to measure the extent of fecal incontinence. These include the frequency of fecal leakage(2), the degree of soiling(6), the use of pads(3) and the consistency of pads(1). The respondents in this study were asked about the frequency of fecal leakage from a question that asked 'Do you ever leak from your bowels when you don't mean to (during the day or night)?' There were six response categories to both the urine and fecal leakage questions ('never/rarely', 'several times a year', 'several times a month', several times a week', 'several times a day', or 'continuously'). Respondents were also asked about the degree of fecal

soiling from a question that asked if the leakage from their bowels usually caused: 'minor staining of underwear', 'soiling of underwear', 'soiling of outer clothing' or 'soiling of furnishing or bedding'. These two measures (frequency and degree of soiling) have been identified as essential to any grading system to assess the severity of fecal incontinence.(16) Urinary incontinence was defined as urinary leakage on a monthly basis or more often, from a question that asked 'Do you ever leak any urine when you don't mean to (this means anything from a few drops to a flood during the day or night)?'

Major fecal incontinence in this study was defined as SOILING of underwear, outer clothing, furnishing or bedding several times a month or more often. Minor fecal incontinence was defined as STAINING of underwear several times a month or more often. Rare or no fecal incontinence included respondents who reported leakage several times a year or less, irrespective of the degree of soiling. Double incontinence was defined as monthly urinary and major fecal incontinence and isolated fecal incontinence was defined as major fecal incontinence without the presence of urinary incontinence. Functional limitation was defined as having difficulties with activities of daily living (difficulties with getting around the house, and/or dressing, and/or having a long term health problem which affects daily activities).

Statistical Methods

Those who did not respond to the stroke question were compared with those who did using a Mann-Whitney U test for age (continuous variable) and a chi-square test for

109 sex (binary variable). Chi-squared tests were used to compare binary and nominal
110 variables between the stroke and non-stroke population. In univariate analyses,
111 missing data were excluded on individual variables, therefore different denominators
112 are reported for each variable. Multivariate logistic regression models were used to
113 explore the association between stroke and fecal incontinence after adjustment for
114 confounding factors such as age, sex and functional limitation (fecal incontinence
115 was the dependant variable in these analyses). Analysis was performed using a
116 Statistical Package for the Social Sciences (SPSS) version 9 for Windows. This
117 study had ethical approval from the local Ethical Committee in Leicestershire.

118

Results

Response rate

Out of the 64749 questionnaires mailed, 3810 (6%) were excluded because either the person no longer lived at the address, had moved to a residential or nursing home or was deceased. Of the remaining 60939 questionnaires mailed, 39519 were returned (65%) and of these 39311 (99%) were analyzable. Response rates were lowest in the youngest and oldest age groups (i.e. 40-49 years and 80+ years) and slightly lower in men. Analysis has been carried out on 38633 individuals who responded to the stroke question (excluding 1.7% missing data). Non-responders (n=676) to the stroke question were significantly more likely than responders (n=38633) to be female (37% versus 46%, $p<0.001$) and older (median age 69 years versus 58 years, $p<0.001$).

Comparison between the stroke and non-stroke population

The overall prevalence of stroke was 4% (n=1483). Fifty four percent of stroke survivors were male compared with 46% in the non-stroke group ($p<0.001$, see Table 1). The stroke survivors on the whole represented a significantly older group than the non-stroke population (median age 72 years compared with 57 years, $p<0.001$) which was reflected in the higher percentage of stroke survivors being retired. Not surprisingly, stroke survivors perceived their general health to be poorer than the non-stroke population, and a larger proportion also reported having difficulties with daily activities (Table 1).

Prevalence of fecal incontinence

In the overall population major fecal incontinence (soiling of underwear or more on a monthly basis) was reported in 1.5% (n=580). Stroke survivors reported a significantly higher prevalence of any fecal incontinence than the non-stroke population, 7.4% compared with 2.9% (see Table 1). Similarly, 5% of stroke survivors reported major fecal incontinence, compared with 1.4% of the non-stroke population. The prevalence of double incontinence, defined as major fecal and monthly urine leakage, was more than four times higher amongst stroke survivors than in the non-stroke population (4.3%, versus 0.9%, $p<0.001$). Isolated fecal incontinence was also significantly higher in the stroke population. The presence of isolated urinary incontinence was reported in 25% (n=339/1342) of the stroke sample compared with 14% (n=4924/35490) in the non-stroke population ($p<0.001$).

Of stroke survivors who reported major fecal incontinence, 27% (n=19/70) of stroke survivors reported that the amount of leakage of feces soiled their furnishings or bedding compared with 11% (n=55/510) of the non-stroke population ($p<0.001$), suggesting that the fecal incontinence in the stroke population was more severe than in those who had not had a stroke (see Table 2). The increased odds of major fecal incontinence in stroke survivors was attenuated though still significant after adjustment for age, sex and presence of urinary incontinence (Table 3). Even when functional limitation was adjusted for the relationship between stroke and fecal incontinence remained (OR 1.33; 95% CI 1.01 to 1.76, see Table 3). There was no significant interaction between the presence of stroke and functional limitation suggesting that those with functional limitations were more likely to report fecal incontinence than those with no mobility problems, regardless of whether or not they had experienced a stroke (OR = 4.02 95% CI 3.27 to 4.95).

Discussion

These findings confirm previous research that both urinary and fecal incontinence are more prevalent in stroke survivors than non-stroke, (8) (14) (15) but that this cannot be wholly explained by their increased functional limitation or more advanced age. The severity of fecal incontinence, expressed by the extent of soiling, is also more severe in stroke survivors. These data suggest that the prevalence of fecal incontinence is only slightly lower in the community than in hospital based stroke patient groups. This study shows that stroke survivors were three and a half times more likely to report major fecal incontinence, with double incontinence being more than four times higher in stroke survivors than the non-stroke population.

The 5% prevalence of major fecal incontinence reported in this sample of stroke survivors is lower than the two studies that have investigated the prevalence of fecal incontinence six months after the onset of a stroke.(14) (15) It is also considerably lower than the most recent published study of fecal incontinence post-stroke, whereby fecal incontinence was reported in 15% three years post stroke (11). This may be partially explained by the use of different definitions of fecal incontinence. It is also difficult to make direct comparisons because their definitions of fecal incontinence are either not clear (14) (15) or their sample populations studied are very different (11). The validity of the Barthel Index for assessing fecal incontinence has been called into question as it can not distinguish between those individuals who have only one fecal incontinence episode and those with more frequent episodes (19).

192 This present study has taken a community perspective, whereas other studies that
193 have reported on fecal incontinence in stroke survivors have obtained their sample
194 through hospital admission records. It has also incorporated not only frequency of
195 fecal leakage but the degree of soiling that occurs, both being essential when
196 assessing the severity of fecal incontinence (16).

197
198 A limitation of this study is that no data were collected on when the stroke occurred
199 and therefore we are unable to identify the prevalence of fecal incontinence in
200 relation to the specific time after the stroke. It would also have been interesting to
201 investigate the prevalence of fecal incontinence over different time periods but this is
202 past the remit of this study. Response rates for the postal questionnaire were lowest
203 in the youngest and highest age groups and the study sample excluded people living
204 in institutional care. Therefore the prevalence of fecal incontinence in the older
205 population could be an underestimate. However an investigation into the non-
206 response bias to the postal questionnaire was undertaken and there was no
207 evidence of non-response bias in reporting urinary symptoms (20). Although fecal
208 incontinence was not investigated there is no reason to believe that this would show
209 evidence of bias. This study was also unable to investigate other known risk factors
210 for fecal incontinence, for example diabetes mellitus, use of anti-cholinergic drugs or
211 other co-morbid conditions.

212
213 The management of bladder and bowel problems is seen as an essential area of a
214 stroke survivor's rehabilitation in both the UK (21) and the USA (22). Through the
215 Agency for Health Care Policy and Research, a national practice guideline for post
216 stroke rehabilitation highlights the need for bowel management programs to be

implemented in those survivors with persistent fecal incontinence (22). Similarly in the UK National guidelines for stroke suggest that hospitals should have established assessment and management protocols for urinary and fecal incontinence. Furthermore continence services should cover both the hospital and the community to ensure continuity of care (23) (24). Further research into whether community stroke survivors have sought help specifically for their urinary and fecal incontinence is needed in order to explore whether there are any barriers to providing this kind of service to this particular group.

Recent debates on health care for older people have emphasized the importance of enhancing quality of life and independence in older people and the need to prevent inappropriate admissions to long-term care (24). Urinary incontinence is often cited as one of the reasons why caregivers relinquish their role in the community and place the older people into residential homes,(5) (25) (26) with the presence of fecal incontinence compounding the risk of institutionalization.(7) This present study has gone further than other studies by indicating the severity of fecal leakage reported in stroke survivors. These results show that stroke survivors with fecal incontinence were twice as likely to report leakage severe enough to soil their furnishings or bedding compared with the non-stroke population. Other reasons for incontinence might include the use of laxatives, autonomic neuropathy, impaired mobility, difficulty with communication, prescribed drugs and diet and further research into this needs to be explored.

This study also suggests that functional limitations are an important influencing factor that can contribute to the presence of fecal incontinence. Severe urinary and fecal

242 incontinence are shown to be related to mortality in elderly people living at home.(27)
243 Fecal incontinence can also contribute to decreased levels of social activities (28)
244 which in turn could isolate not only the stroke survivor but also the person that cares
245 for them. Future research needs to investigate how best to manage or treat these
246 symptoms in stroke survivors in order to reduce the risk of both the survivor and
247 carer becoming socially isolated within the community. Health care professionals
248 working within primary care and treating patients with stroke should be aware of the
249 prevalence of fecal incontinence and what relevant treatment options are available.
250 A recent published review has highlighted several new treatments available for
251 patients with neurological diseases or damage.(29) Furthermore those professionals
252 working in the community with older disabled people need to assess ways in which
253 appropriate aids and appliances can be adapted to promote fecal continence within
254 their homes.
255

256 **Conclusions**

257 These data show a high prevalence of fecal incontinence in community dwelling
258 stroke survivors. Stroke survivors who reported experiencing fecal incontinence also
259 reported higher levels of fecal soiling which must be an important contributor to
260 decreased morale in both the stroke survivor and their carer.

Table 1: Details of the stroke survivors and the non-stroke population included in this study

	Stroke Survivors		Non-Stroke Population		
	n = 1483		N = 37150		
	%	Number	%	Number	p-value
Average age (median)	72 years	IQR: 64-79	57 years	IQR: 48-68	p<0.001
Male	54	802	46	16959	p<0.001
Female	46	681	54	20191	p<0.001
Living alone	28	408	18	6532	p<0.001
Owned / mortgaged accommodation	66	960	82	30265	p<0.001
Retired	76	1091	39	14159	p<0.001
White	92	1346	93	34196	p<0.058
South Asian (Indian, Bangladeshi, Pakistani)	7	105	6	2192	p<0.058
Needed help completing questionnaire	25	1455	6	36777	p<0.001
General health: poor	20	285	4	1434	p<0.001
Functional limitations	71	1014	26	9198	p<0.001
Any fecal incontinence	7.4	103	2.9	1054	p<0.001
Major fecal incontinence	5	70	1.4	510	p<0.001
Minor fecal incontinence	2.4	33	1.5	544	

* Mann-Whitney U tests

Table 2: Severity of fecal leakage amongst stroke and non-stroke population reporting monthly fecal incontinence ($\chi^2=15.24$, $p<0.001$)

Severity of fecal leakage	Stroke % (n 70)	Non-Stroke % (n 510)	Total % (n=580)
Furnishing / bedding	27% (19)	11% (55)	13% (74)
outer clothing	7% (5)	6% (32)	6% (37)
Underwear	66% (46)	83% (423)	81% (469)

Table 3: Multivariate logistic regression model: Relationship between major faecal incontinence and stroke

		MODEL 1*		MODEL 2**	
		Odds Ratio*	95% Confidence Interval	Odds Ratio*	95% Confidence Interval
Stroke	(yes versus no)	1.75	1.32 - 2.30	1.33	1.01 - 1.76
Sex	(female versus male)	0.75	0.63 - 0.90	0.79	0.66 - 0.95
Age	(years above 40)	1.03	1.03 - 1.04	1.02	1.01 - 1.03
Urinary incontinence	(yes versus no)	10.53	8.76 - 12.65	8.10	6.62 - 9.69
Functional limitations	(yes versus no)	-	-	4.02	3.27 - 4.95

*MODEL 1: Adjusting for age, sex and urinary incontinence

**MODEL 2: adjusting for age, sex, urinary incontinence and functional limitation

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Author Name: Sarah Perry: study design, recruitment, interpretation and editing of manuscript

Author Name: Chris Shaw: study design, recruitment, interpretation and editing of manuscript

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