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Association between the Geriatric Giants of urinary incontinence and falls in older people using data from the Leicestershire MRC Incontinence Study

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Abstract

Objective: to determine whether urinary incontinence *per se* and different types of urinary incontinence individually are associated with an increased risk of falls in those aged 70 years and over. To investigate whether the presence of urinary symptoms, poor quality of life and physical limitations in this population with urinary incontinence is associated with falls.

Design: study using data from the cross-sectional postal questionnaire undertaken in the Leicestershire Medical Research Council Incontinence Study.

Setting: Leicestershire.

Participants: a total of 5,474 people aged 70 years or more living in the community randomly selected from general practitioners' lists.

Results: urinary incontinence and both urge and stress incontinence were positively related to falls ($P < 0.0001$, $P < 0.001$ and $P = 0.007$, respectively). The larger the volume of urine lost, the greater the risk of falls ($P < 0.0001$). Falls were associated with the presence of urinary symptoms ($P = 0.01$ or less), physical limitations ($P = 0.001$ or less) and having a poorer quality of life ($P = 0.004$ or less) in respondents with urinary incontinence.

Conclusions: an association has been shown between falling and urinary leakage including the previously unreported association with stress leakage. Falling and urinary incontinence were found to be associated with physical limitations and had an impact on quality of life.

Keywords: urinary, incontinence, falls, elderly

Introduction

Falls are common in the elderly population. Falls may lead to fractures [1, 2], fear of falling and loss of confidence [3]. Urinary incontinence and falls both lead to increased rates of hospitalisation, need for institutional care [4–6] and anxiety and depression [7, 8].

In subjects aged 65 years or older, the prevalence of urinary incontinence is estimated to be 8–22% [9, 10] and the prevalence of falls 19–50% [11–13]. These are two of the so-called ‘Giants of Geriatrics’ [14] which, along with cognitive impairment and immobility, are key areas in the specialty of Medicine for the Elderly.

Between 0.85 and 1.5% of total health care expenditure is spent on falls [15] and 2% on urinary incontinence [16]. This has been calculated to cost the UK government more than £900 million per annum on falls alone [17].

The question that this study aims to answer is whether there is an association between falls and different forms of urinary incontinence in older people. We also looked at the presence of urinary symptoms and quality of life with relation to falls and incontinence of urine. It is important to establish if links exist in order to look for common causes or solutions and to aid in service development.

It is already known that weekly, or more frequent, urge urinary incontinence is independently associated with falling [18], likewise mixed urinary incontinence [19]. Urinary incontinence, both stress and urge, have previously been shown to be associated with poor physical health across the range of body systems [20].

The database from the Leicestershire Medical Research Council (MRC) Incontinence Study¹ has been used in this pre-planned study as relevant questions had been included in the original questionnaire.

Methods

The Leicestershire MRC Incontinence Study comprised of five interconnected studies that investigated the epidemiology, prevalence and management of incontinence. The

study was conducted using a postal questionnaire that was mailed between October 1998 and July 1999 to a cross-sectional sample randomly selected from general practitioners’ lists in Leicestershire. People living in care homes were excluded. The postal questionnaires were completed by the subject or on their behalf and included questions on general health and urinary and bowel symptoms. Demographic data were also collected.

The questionnaire was sent to 40,000 people, of which 23,000 (57.5%) were completed and returned. The responses from 5,474 subjects aged 70 years and over have been analysed in this study.

Questions

For the purpose of this study, the responses to the questions ‘Do you ever leak urine when you don’t mean to?’, ‘Does any urine leak when you laugh, cough or exercise?’ and ‘Do you have such a strong desire to pass urine that you leak before reaching the toilet?’ were used to identify people with urinary leakage, stress urinary incontinence and urge urinary incontinence, respectively. Positive answers to all questions identified the subjects with mixed urinary incontinence.

The question ‘How many times have you fallen in the last year?’ was used to identify respondents who had reported at least one fall in the previous year.

A large volume of urine leakage was defined as answering being soaked or wet in reply to the question on the amount of urine leaked. Small volumes of urine leakage were identified as being damp or almost dry. The questionnaire also included questions on urinary symptoms, e.g. pain on micturition.

The postal survey included questions about whether urinary symptoms bothered the subject, caused interference with activities or social life, affected relationships, caused distress or impacted on their quality of life. The Hospital Anxiety and Depression Score (HADS) [21] questions were also included. This is a self-screening tool to identify anxiety or depression. A score of ≥ 11 indicates the presence of anxiety or depression.

The presence of physical limitations was identified in the questionnaire by positive responses to one or more of the following: problem walking 100 yards; difficulty bathing

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or dressing independently; struggling to get around the house; restriction getting into or out of a chair; limitations in being able to feed independently.

Statistical analysis

The primary association under examination was that between falls and different types of urinary incontinence. Secondary analysis of association between volume of urine lost, urinary symptoms and quality of life with relation to falls and incontinence was performed. Statistical analysis was performed using SPSS for Windows (version 11, SPSS, Inc., 2002) to compare the variables as defined above. The Chi-square test was used to analyse the data. Some respondents missed out some parts of the questionnaire. This has been accounted for in the discussion section.

Results

Demographics

A total of 5,474 people in the study were aged 70 years or over with a median age of 76 years (IQR: 72–80 years). Fifty-seven percent ($n = 3,122$) were female, 27.7% ($n = 1,519$) were aged 80 years or over and 95.1% ($n = 5,206$) described their ethnic origin to be ‘White’ with small percentages being Indian, Pakistani, Black, Chinese or other.

Urinary leak and falls

Of the subjects aged 70 years or more and for whom data were available, 26.7% ($n = 1,405/5,256$) admitted to urine leak. Falls occurred in 35.3% ($n = 1,902/5,385$) of subjects in the previous year. Table 1 shows data for those who answered to questions both on falls and urinary leak (Table 1).

Females were significantly more likely to experience urinary leakage than males (29% versus 23.3%, $P < 0.0001$) and were significantly more likely to report a fall (40.7% versus 27.8%, $P < 0.0001$).

Urinary incontinence was associated with falls; 47.6% ($n = 652/1,370$) of people who reported a urine leak fell in

Table 1. The incidence of urinary leak and falls in the previous year: Leicestershire MRC Incontinence Study

	No falls in previous year		Falls ≤ 1 in previous year		P-value
	No urine leak	Urine leak	No urine leak	Urine leak	
Age, median (IQR)	79 (75–84)	77 (73–80)	78 (74–83)	76 (72–80)	
Male	1,295	325	426	199	$P < 0.0001$
Female	1,336	393	735	453	$P < 0.0001$
Total	2,631	718	1,161	652	

comparison with 30.6% with none ($n = 1,161/3,792$) ($P < 0.0001$).

Urinary stress incontinence and falls

Stress incontinence was reported by 16.5% ($n = 846/5,122$) of the subjects. Females were significantly more likely to have urinary stress incontinence than males (731 versus 115, $P < 0.0001$). The subjects who fell were nearly twice as likely to experience stress urinary incontinence as non-fallers (23.4% versus 12.8%, 422/1,378 fallers versus 424/3,322 non-fallers had urinary stress incontinence, $P < 0.0001$).

Urinary urge incontinence and falls

Urge incontinence was reported by 24.9% ($n = 1,267/5,091$) of the subjects. Females were more likely to experience urge incontinence than males (793 versus 474, $P < 0.0001$). Urinary urge incontinence was demonstrated to be more common in subjects who fell (34.5% versus 19.6%, 619/1,792 fallers versus 648/3,299 non-fallers reported urinary urge incontinence, $P < 0.0001$).

Isolated stress or urge urinary incontinence and falls

Many subjects’ replies suggested they had mixed stress and urge urinary incontinence. A significant association between pure stress or urge leakage and falling was still present after removing the mixed urinary incontinence subjects from the analysis (P -values 0.007 and < 0.001 for stress and urge urinary incontinence, respectively). Falls were present in 38.1% of respondents with pure stress and 39.4% with pure urge urinary continence (Table 2).

Volume of urine lost

A total of 2,189 of the study subjects reported the volume of urine that they leaked when incontinent; 1,335 of these also reported whether they fell. Subjects with large urinary loss through incontinence were more likely to fall (67.3% with reported large volume loss of urine fell versus 43.7% with small volume, $P < 0.0001$) (Table 3, Supplementary data are available in *Age and Ageing* online, Appendix Figure S1).

Urinary symptoms

Subjects with both urinary incontinence and urinary symptoms were more likely to fall (P -value of 0.001 for pain in bladder or pain on micturition with falls, P -value of 0.01 for having to strain to pass urine and falling) (Supplementary data are available in *Age and Ageing* online, Appendix Table S4).

Table 2. The incidence of falls in relation to either isolated stress urinary incontinence or pure urge incontinence after excluding subjects with mixed urinary incontinence

	No falls in previous year		Falls ≥ 1 in previous year		<i>P</i> -value
Complete data for 3,611 subjects	Incontinence not present 2,372	Stress incontinence only 138	Incontinence not present 1,016	Stress incontinence only 85	0.007
Complete data for 3,893 subjects	Incontinence not present 2,372	Urge incontinence only 306	Incontinence not present 1,016	Urge incontinence only 199	<0.001

Table 3. Table to show the volume of urine lost in incontinent subjects and the presence of falls

	No falls in previous year	Falls ≥ 1 in previous year	<i>P</i> -value
Amount of urine lost large (made subject soaked/wet)	74	152	<0.0001
Amount of urine lost small (made subject damp/almost dry)	624	485	

Physical limitations

The presence of physical limitations was significantly associated with falls in incontinent subjects (*P*-values <0.001) (Supplementary data are available in Age and Ageing online, Appendix Table S5).

Quality of life

Most respondents with urinary incontinence were bothered by their symptoms. Subjects who experienced both urinary incontinence and falls were significantly more likely to report effects on their social life, symptoms of upset or distress and a perception of a poor quality of life (*P* < 0.001). There was also a statistically significant link between symptoms of anxiety and depression in those with urinary incontinence and falls (*P* < 0.001) (Supplementary data are available in Age and Ageing online, Appendix Table S6).

Discussion

The association between urinary urge or mixed incontinence and falls has previously been demonstrated [17, 18]. The purpose of this study was to examine this association further in a community-dwelling population study. The archived data from the Leicestershire MRC Incontinence Study was used for this study as relevant questions had been included in the original questionnaire.

Findings

Incontinence and falls were both found to be more prevalent in females than males. The same also applied to stress and urge urinary incontinence. Research has previously demonstrated a link between falls and urinary incontinence

[22], urinary urge incontinence and falls [18] and mixed urinary incontinence and falls [19]. This study is the first to report an association between urinary stress incontinence and falls in people aged over 70 years living at home (*P* < 0.007). A relationship between urinary urge incontinence and falls was confirmed (*P* < 0.001).

The risk of falling was found to be higher in the people with the greatest amount of urine loss which suggests that the more severely affected a person is with either of these problems the more likely they are to suffer with the other.

Incontinent subjects who experienced urinary symptoms, such as pain on micturition, and those limited physically were significantly more likely to fall. This confirms Tinetti *et al*'s [23] previous findings, which showed that the risk of falling and/or incontinence increased with the number of functional domains impaired. Significant relationships were also demonstrated between urinary incontinence and falls with poor quality of life, anxiety and depression and reduced social activity.

Limitations of the study

The large number of older people in the population sampled was all living at home. Care home residents were specifically excluded from the original study sample. The findings in this study cannot be directly extrapolated to that population.

The majority (95.1%) of respondents aged 70 years and over described themselves as 'White'. This represents a low level of ethnic diversity among those providing data. Before extrapolating the results across different racial groups research would have to be performed to establish if there are any racial differences for urinary incontinence or falls.

The response rate to the mass mailing of the questionnaire was good but there was a lower overall response rate to the questions relating to the symptoms of stress incontinence alone (1,863 out of the 5,474 respondents not supplying this data) or urge incontinence alone (1,581 out of 5,474 with no data). The survey was not designed or powered to look for an association between these parameters.

Anonymity was assured for all those who responded. The possibility that respondents under-report symptoms of urinary incontinence is recognised [24]. Some people may be reluctant to disclose sensitive details such as incontinence or difficulty coping independently, even in an anonymous questionnaire. A previous study has indicated that the

presence of missing data leads to an underestimate of urinary incontinence and general health [25]. There was no opportunity to clinically validate the reported symptoms.

Conclusion

The association of urinary incontinence and falls with poor mobility in older people may be a reflection of the general poorer physical condition of many older people. The unexpected association between the symptoms of stress urinary leakage and falling could be an indication of a general alteration in striated muscle physiology in the ageing population, rather than the more common causes of stress urinary leakage seen in younger women.

Dual-tasking or trying to do two things simultaneously is a recognised cause of falls [26]. In this setting the dual tasks would be attempting to walk to the bathroom and trying to prevent leakage of urine.

The theme that emerges from this study is that, even in community-dwelling older people, there is evidence linking the traditional ‘Geriatric Giants’ of immobility, instability and incontinence. This suggests that if an older person suffers a problem with one of the ‘Giants’ then there is an increased likelihood of them having a problem with another.

The fourth traditional ‘Giant’ confusion was not assessed in this study but incontinence and falls are well recognised in confused patients [27].

Clinicians when assessing patients with continence problems in later life should consider factors other than the bladder that can influence continence, particularly in patients with limitations in their physical activity and/or a history of falling.

The study challenges us to explore further the links between the ‘Geriatric Giants’ to determine whether there are ways to prevent, delay or reverse these major challenges to the independence of older people continuing to live in their own homes.

Key points

- Urinary incontinence was positively associated with falls.
- Both urinary stress and urge incontinence were associated with falls.
- The larger the volume of urine lost, the greater the risk of falls.
- Both falls and incontinence were associated with the presence of urinary symptoms.
- Both falls and incontinence were associated with physical limitations.

Conflicts of interest

None declared.

Supplementary data

Supplementary data mentioned in the text is available to subscribers in *Age and Ageing* online.

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‘There’s a hell of a noise’: living with a hearing loss in residential care

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Abstract

Background: hearing loss is common in older age. Research with older people in residential care settings has identified high prevalence of hearing loss and low uptake of hearing aids. Hearing loss in these settings is associated with reduced social engagement. Although hearing aids remain the default treatment for presbycusis hearing loss, these are not well used. We do not know what other modifiable factors contribute to communication problems for older people with hearing loss living in residential care.

Objectives: to explore the factors affecting communicating with a hearing loss in residential care.

Methods: an ethnographic study in two residential care homes comprised 19 sessions of observation, and in-depth interviews with 18 residents. Observations explored communication behaviour in everyday interactions, including mealtimes, structured groups and informal group activities. Interviews were informed by the observations and identified reasons for these behaviours and communication preferences. Observational data were recorded in field notes and interviews were audio-recorded and transcribed. Analysis was conducted using constant comparison methods.

Results: hearing loss affected whether residents were able to access social opportunities. Two key themes influenced this (i) contextual issues compounded communication difficulties and (ii) environmental noise restricted the residents’ communication choices. Problems were observed at every mealtime and during formal and informal group activities. The use of hearing aids and access to hearing services did not improve social engagement.

Conclusions: environmental and social factors are key to maximising communication opportunities. Improvements to communication in residential care settings could be based on changes in these with input from residents and staff. Further work is needed to develop effective communication strategies in residential care.

Keywords: older age, hearing loss, communication, hearing aid, residential care, elderly