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# Changes in urinary incontinence and quality of life after four years

## *A population-based study of women aged 22–50 years*

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**Objectives** – To investigate (a) the incidence and remission rates of female urinary incontinence (UI), (b) changes in type of UI and quality of life (QoL), and (c) whether professional help had been consulted regarding UI.

**Design** – A 4-year follow-up population-based cohort study.

**Setting** – Surahammar, Sweden, a community of 10,500 inhabitants.

**Subjects** – All 118 incontinent and 130 continent women aged between 22 and 50 years.

**Main outcome measures** – Changes in type of UI were measured using the Detrusor Instability Score (DIS), which was used to distinguish between the stress incontinent and the urge incontinent women. Changes in QoL were measured using the SF-36 Health Survey.

**Results** – The mean annual incidence and remission rates of UI were the same (4%). The majority of women (83%) reported unchanged UI

after 4 years and 77% of these women had stress incontinence. At follow-up, the changes in QoL scores were significantly greater in five out of eight dimensions in the persistently incontinent group compared with the persistently continent group. QoL scores did not change significantly from baseline to the 4-year follow-up within the incidence and remission groups. Three of four women with UI had not sought professional help.

**Conclusions** – At 4-year follow-up the type of UI is fairly stable in women below 50 years of age. The QoL decreases in five dimensions, but the clinical relevance of this might be questioned. Most women with UI had not sought professional help.

**Key words:** follow-up studies, incidence, quality of life, SF-36, urinary incontinence, women.

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Urinary incontinence (UI) is a prevalent disorder among women of all ages. The existing studies in this field have yielded varying results, with a prevalence rate of UI in women ranging from 10 to 41% (1–4). Furthermore, the prevalence of UI was found to increase as a function of age (4). UI is not a stable condition over time. From previous studies we know that some women may improve or even reach total recovery from their UI. In women younger than 60 years the annual incidence of UI has been estimated to be between 3 and 10% (5–7), while the annual remission of incontinence has been found to be between 6 and 28% (6,7). Consequently, when studying the natural history of UI it would be of value to include changes in quality of life (QoL) since UI is known to have a pronounced influence on women's QoL (1,2,8–11). The SF-36 questionnaire, a generic QoL instrument, has been shown to be sensitive to changes in QoL in intervention studies including patients with myocardial infarction, low back pain, diabetes, depressive symptoms (12–14). To our knowledge, studies measuring changes in QoL as a component in natural history for women with UI are lacking.

Good long-term effectiveness of simple treatment options, such as pelvic floor exercises, medication and

bladder training, have been reported (15,16). Still, a majority of women with UI never seek professional help and are left to manage their incontinence on their own (1,2,10,11).

The aims of the present 4-year follow-up study were to investigate (a) the incidence and remission rates of female UI, (b) changes in type of incontinence and QoL, and (c) whether professional help had been consulted regarding incontinence.

Measuring changes in quality of life as a component in the natural history of urinary incontinence has still not been investigated.

- At 4-year follow-up, the type of urinary incontinence is fairly stable in women below 50 years of age.
- Quality of life decreases in five dimensions in women with urinary incontinence compared to women without incontinence.
- Three of four women with persistent urinary incontinence do not seek professional help.

## SUBJECTS AND METHODS

This 4-year follow-up study including 145 incontinent and 193 continent women aged 22–50 years was performed in the community of Surahammar, Sweden in 2000. These women had participated earlier in a prevalence study performed in 1995 (3), and in a QoL study performed in 1996 (11). To enhance the response rate, two postal reminders were sent. The response rate was 73% (248/338). Six percent of the non-responders (20/338) could not be located because of inaccurate or incomplete address and the others refused to answer. Among the 248 responders at follow-up, 118 reported UI and 130 reported being continent (Fig. 1). The women were allocated to one of four study groups depending on their condition regarding UI: a persistently incontinent group (PI group), an incidence group, a remission group and a persistently continent group (PC group). Which group the women were assigned to was determined by their response in 1996 and 2000 to the screening question, “At the present time, do you have a problem with involuntary loss of urine (for example, when you laugh, jump, cough or sneeze)?” The regional ethics committee at Uppsala University approved the study.

### Questionnaire

The follow-up questionnaire, which was identical to that used in 1996, consisted of three components: the SF-36 Health Survey, the Detrusor Instability Score and three complementary questions about UI.

### SF-36 QoL questionnaire

The Swedish version of the SF-36 Health Survey was used. The questionnaire is a generic health status measure consisting of 36 items divided into eight QoL multi-item dimensions. The scores range from 0 to 100 for each dimension, with 100 indicating optimal QoL (17).

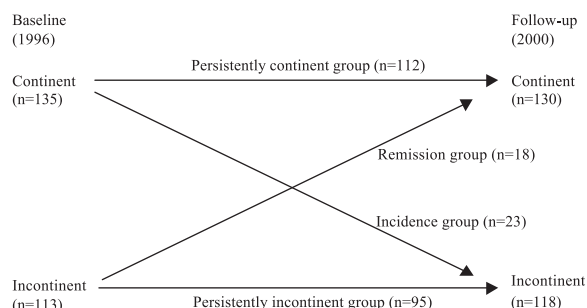


Fig. 1. The formation of the four groups of women at baseline (1996) and follow-up (2000) (n = 248).

### Detrusor Instability Score

The Detrusor Instability Score (DIS), a symptom questionnaire, comprises 10 questions concerning stress or urge incontinence. A total score ranging from 0 to 7 indicates pure stress incontinence or stress incontinence plus slight detrusor instability, while a total score ranging from 8 to 20 indicates marked detrusor instability (18).

### Three complementary questions about UI

The following additional questions were asked: duration and frequency of incontinence (daily, less than once a week, less than once a month, seldom) and whether professional health care services had been consulted regarding incontinence.

### Statistical methods

At the 4-year follow-up, chi-square tests were used to analyse the difference for the incidence and remission rates of UI for the age groups 22–30 years, 31–40 years and 41–50 years. Differences between baseline and follow-up DIS in the PI group were studied with paired Student's t-tests (two-tailed). Because of the discrete and skewed distribution of the QoL data, non-parametric tests were applied. The Wilcoxon signed-rank test was used to analyse differences in QoL scores over time within the four study groups. To compare differences in QoL change scores between the PC and PI group the median test was performed (19). Statistical significance was set to  $p < 0.05$ .

## RESULTS

At the 4-year follow-up in 2000, 118 women were found to be incontinent. Of these women, 95 had remained incontinent between 1996 and 2000 and 23 had become incontinent at some point during this period. In total, 130 women were continent at the 4-year follow-up. Of these women, 112 had remained continent between 1996 and 2000 and 18 had become continent at some time during this period (Fig. 1).

Background data, including age, educational level, marital and employment status did not differ between the PI and PC groups.

### Incidence rate of UI

The incidence rate of UI from 1996 to 2000 was 17% (23/135), corresponding to a mean annual incidence rate of 4%. The incidence rate tended to increase with age (Table I), though the increase did not reach statistical significance. In the incidence group, 21 of 23 women reported  $\leq 7$  points on the DIS (median 2), while the remaining two reported 8–9 points. Incontinence was reported to occur daily by one woman, weekly by four, monthly by one and seldom by 17.

Table I. The 4-year incidence and remission rates of female UI in relation to different age groups (n = 248).

Age group	Women continent at baseline	Incidence		Women incontinent at baseline	Remission	
		n	%		n	%
Years	n			n		
22–30	15	2	13	6	2	33
31–40	44	7	16	44	8	18
41–50	76	14	18	63	8	13
Total	135	23	17	113	18	16

Eighteen and five women reported small and moderate urine loss, respectively.

#### *Remission of UI*

The remission rate between 1996 and 2000 was 16% (18/113), corresponding to a mean annual remission rate of 4%. Remission had a tendency to decrease with age (Table I), although the decrease between age groups was not significant. All 18 women in the remission group reported  $\leq 7$  points on the DIS (median 3) at baseline. At baseline, 17 women reported a small urine loss and one woman reported a moderate urine loss.

#### *Persistence of UI*

The PI group consisted of 95 women. Incontinence was reported to occur daily in 27 (28%) women, weekly in 32 (34%), monthly in 15 (16%) and seldom in 21 (22%). Small, moderate and large urine losses were reported by 60 (63%), 33 (35%) and 2 (2%) women, respectively. The median duration of incontinence in 2000 was 8 years (range 4–23 years). The mean DIS at baseline was 3.9 points (CI 3.4–4.5, median 4) and at follow-up 4.4 points (CI 3.8–5.1, median 4); this increase, however, was not statistically significant.

Between 1996 and 2000, 73 women had persistent stress incontinence (DIS  $\leq 7$  points) and 6 women had persistent urge incontinence (DIS  $> 7$  points). In the remaining 16 women, 11 women changed from stress incontinence to urge incontinence and 5 women changed from urge incontinence to stress incontinence.

#### *QoL scores*

In the PC group the QoL scores at follow-up were significantly lower as compared with baseline in one of the eight QoL dimensions (vitality). In the PI group the scores at follow-up were significantly lower than the baseline scores in seven QoL dimensions (role-physical, role-emotional, social functioning, bodily pain, vitality, mental health and general health). The changes in QoL scores from baseline to follow-up did not differ significantly within the incidence or remission group.

At the 4-year follow-up, the median differences in QoL change scores were significantly greater in the PI than in the PC group on the dimensions of physical functioning, role-emotional, social functioning, bodily pain and vitality (Table II).

#### *Consultation because of UI*

Of the 118 women with UI at the 4-year follow-up (Fig. 1), 76% (90/118), (DIS, median 3) had not consulted professional health care services for their incontinence. Four women in the incidence group and 24 women in the persistent incontinence group (DIS, median 5) had consulted the professional health care services because of UI since 1996.

## DISCUSSION

In this 4-year follow-up study among women aged 22–50 years, stress incontinence seems to be the most common type of UI. The mean annual incidence and remission rates of UI were the same (4%). Women with persistent UI had a lower QoL in 5 out of 8 SF-36 dimensions compared to women with persistent continence after 4 years. Most women with persistent UI had not sought professional help.

A strength in this survey is the follow-up of a large group of women during a 4-year period with a participation rate of 73%. The screening question "For the present time do you have a problem with involuntary loss of urine (for example, when you laugh, jump, cough or sneeze)?" may be problematic. It seems that women with an urge component to their symptoms would be missed, but the number of women with urge incontinence (16%) in this study is even higher than that found in some other population-based studies (1,6), which may be interpreted that the participants have understood the question correctly.

At the 4-year follow-up the mean annual incidence rate was on the same level (4%) as the remission rate of UI. These findings are in accordance with a 5-year follow-up study in women 25–65 years old, where the mean annual incidence rate was 3% and the mean annual remission rate 6% (6). In another population-based study, Möller et al. found the incidence and the remission rates of UI about 10% and 28%, respectively.

Table II. QoL scores in women with persistent urinary incontinence (PI) and persistent continence (PC) at baseline (1996) and follow-up (2000).

SF-36 questionnaire	Group	Baseline median (10th and 90th percentiles)	Follow-up median (10th and 90th percentiles)	Median difference in QoL change between the PI and PC group	No. of women below the overall median (total no. of women)	P-value
Physical functioning	PI	95 (57, 100)	95 (52, 100)		37 (94)	
	PC	100 (80, 100)	100 (75, 100)	0	29 (111)	0.043
Role-physical	PI	100 (57, 100)	100 (0, 100)		30 (95)	
	PC	100 (75, 100)	100 (50, 100)	0	23 (110)	0.082
Role-emotional	PI	100 (0, 100)	100 (0, 100)		31 (94)	
	PC	100 (67, 100)	100 (67, 100)	0	13 (109)	0.000
Social functioning	PI	100 (50, 100)	75 (30, 100)		37 (95)	
	PC	100 (75, 100)	100 (63, 100)	0	28 (111)	0.035
Bodily pain	PI	74 (31, 100)	62 (22, 100)		48 (94)	
	PC	84 (41, 100)	84 (41, 100)	-6	36 (111)	0.007
Vitality	PI	60 (15, 88)	45 (20, 78)		64 (95)	
	PC	75 (35, 90)	70 (30, 90)	-10	54 (112)	0.006
Mental health	PI	76 (30, 94)	64 (40, 92)		63 (95)	
	PC	88 (60, 96)	84 (56, 96)	-4	71 (112)	0.661
General health	PI	77 (30, 99)	62 (30, 97)		63 (94)	
	PC	87 (57, 97)	82 (47, 100)	-3	66 (109)	0.339

These high numbers are probably related to differences in definitions. For example, Möller et al. defined the rate of remission of UI as leakage occurring weekly or more at baseline and decreased to less than weekly and eventually ceased at follow-up (7). In our study, most women in the incidence and remission groups had stress incontinence with infrequent urine leakage and small urine loss, which did not have any impact on their QoL. One explanation for the lack of significant change in QoL for these groups could be the small numbers of subjects. Another explanation is probably the short duration (max. 4 years) of UI for the women in the incidence group. This distinguished them from women who had UI in the study 1996 and who were still incontinent 4 years later (i.e. women in the PI group). These women had had their symptoms for a longer time (median 8 years) and stress incontinence was the most common type of UI. In the present study, it is difficult to draw a conclusion for changes in type of UI due to the small numbers of subjects.

At 4-year follow-up, women with persistent UI, in comparison with women with persistent continence, reported significant deterioration in role-emotional, vitality, social functioning, physical functioning and bodily pain from the SF-36 health survey. The role-emotional dimension describes limitations in such normal daily activities as work, household chores and school because of emotional problems. The vitality dimension describes whether the woman felt fatigue or full of energy. Berglund et al. found that women with stress urinary incontinence of long duration scored significantly higher on personality characteristics such as somatic and psychic

anxiety than the controls (20). The social functioning dimension describes the extent of interference in normal social activities such as visiting friends and family because of physical or emotional problems. The physical functioning dimension shows limitations in walking, running, lifting and carrying. Both social and physical limitations associated with urinary incontinence are described in other studies (21,22). It seems reasonable to ascribe deterioration in QoL on role-emotional, vitality, social functioning and physical functioning scales to UI. However, it is difficult to explain how bodily pain was affected. One explanation may be that urinary incontinence disturbs daily activities, which may be interpreted as bodily pain according to the SF-36 manual. Another explanation may be that neurological handicaps and diseases are associated with UI, and mobility restrictions are associated with bodily pain. However, we did not control concomitant diseases and handicaps in the different groups. Still, this may not be an issue in these relatively young subjects. The deterioration in QoL in the persistent incontinence group might be explained by other factors such as age, educational level, marital and employment status. However, these background data did not differ between the persistently incontinent and the persistently continent groups.

In our study, the women with persistent incontinence scored about 5 to 10 points lower in QoL compared to women with persistent continence. This small difference could be explained by the group of women with persistent incontinence being made up of a large proportion of women with stress incontinence (77%) still after 4 years, a symptom that to some extent is avoidable. In our previous study, using

consultation as an indicator of bothersomeness of the UI a change greater than 13–22 points in any SF-36 dimension was interpreted as clinically meaningful (11). Other investigators have suggested a change of around 20 QoL points for any of the 8 dimensions as being clinically important with this instrument (12,14). Changes in QoL may be a component in the natural history of UI. To our knowledge, measuring QoL over time, as a component in the natural history of UI has still not been investigated and therefore these results need to be interpreted cautiously.

In the present study, one of four women with persistent UI had consulted professional health care services for their incontinence, which is comparable with results from a study of Samuelsson et al. (1). Previous studies have shown that the consultation rate increased with increasing age, severity and bothersomeness (23,24). In our study, three of four women with persistent UI had not sought professional help. Hägglund et al. found that the most common reason given for not seeking help was that the women felt their incontinence was a small problem (25).

In conclusion, this 4-year follow-up study demonstrated that women below 50 years of age with persistent UI had a lower QoL in five of eight dimensions than women with persistent continence. The clinical relevance of these small changes is uncertain but may correspond to the infrequent and small urine loss reported by the women in this study. Concerning type and severity of UI, it appears that the symptoms are fairly stable during the study period of 4 years in women aged 50 years or younger. Consequently, few women with persistent incontinence had sought professional assistance.

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