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INCIDENCE AND REMISSION OF URINARY INCONTINENCE ACCORDING TO TYPE AND SEVERITY AT MIDLIFE

Hypothesis / aims of study
Few cohorts studies have focused on the incidence and remission of Urinary Incontinence (UI) at midlife. The aim of our study was to analyze factors related to incidence and remission of UI at midlife while taking into accounts the different types and severity of UI.

Study design, materials and methods
Our sample consisted of middle-aged women participating in a longitudinal survey, the "Women and their Health" study which is a part of the French GAZEL cohort (http://www.gazel. inserm.fr/). In 2000 (baseline of the present study) and 2008, an additional specific questionnaire about incontinence symptoms was sent to all participants. The question of interest in 2000 and 2008 was "Do you have involuntary loss of urine?". The UI type was determined with the BFLUTS (British Female Low Urinary Track Symptoms) questionnaire. The Sandvik score was used to estimate UI severity. For predicting factors associated with each type of UI (Stress Urinary Incontinence - SUI -, Urgency Urinary Incontinence - UUI - and Mixed Urinary Incontinence - MUI -), six final explanatory models were built using multivariate regression for incidence and remission of UI. A multinomial logistic regression analysis was conducted to assess risk factors associated with the remission and with of UI according its severity (slight, moderate and severe+very severe). The covariables considered were sociodemographic factors, lifestyle characteristics, medical and psychological factors and gynaecological and obstetric history.

Results
Of the 2640 women who had responded in 2000, 2115 (80.11%) responded again about urinary incontinence in 2008. At baseline, their mean age was 54.8 (±0.1), mean parity was 1.62 (±0.02) and mean Body Mass Index (BMI) was 24.4 (±0.1). At all 2115 at baseline were included. Over the study period, the incidence of UI was 21.9% (278/1272) and the remission of UI was 33.33% (281/843). Incidence of UI was 16.0% (190/994) for SUI, 4.0% (41/994) for UUI, and 3.8% (39/994) for MUI. Remission of UI was respectively 37.88 % (200/528) for SUI, 25.49 % (13/51) for UUI and 24.61% (63/256) for MUI. Factors associated with incidence and remission of UI are presented in Table 1 and Table 2.

Table 1: Risk factors for Incidence of SUI, UUI and MUI. Multivariate Analysis

Variable		*SUI incidence** (N=1184) adj OR (CI 95%)	*UUI incidence** (N=1035) adj OR (CI 95%)	*MUI incidence** (N=1033) adj OR (CI 95%)
High school diploma	*yes*	1.49 (0.99-2.24)	-	-
Delta BMI (2000-08)	kg/m²	**1.10 (1.01 -1.21)**	1.18 (0.99-1.41)	-
BMI > 30	*yes*	-	-	2.03 (0.78-5.31)
Vaginal delivery	*yes*	1.48 (0.97-2.27)	2.02 (0.77–5.28)	
POP surgery (2000-08)	*yes*	1.05 (0.21-5.28)		4.95 (0.94-26.1)
UI surgery (at baseline)	*yes*	-	**4.67(1.28-17.1)**	**12.7 (5.12-31.5)**
Hysterectomy (2000-08)	yes	-	-	2.78 (0.83-9.30)
Major depression (CESD≥23 at baseline)	*yes*	**1.75 (1.21-2.53)**	-	-
Alcohol (at Baseline)	*yes*	-	**0.33 (0.13-0.86)**	-

- *Only variables significant at 20% in the univariable analysis were included in each final model*

Table 2: Risk factors for Remission of SUI, UUI and MUI. Multivariate Analysis

Variable		*SUI remission** (N=528) adj OR (CI 95%)	*UUI remission** (N=51) adj OR (CI 95%)	*MUI remission** (N=256) adj OR (CI 95%)
High school diploma	*yes*	-	0.18 (0.02-1.64)	-
BMI > 25	*yes*	-	-	**0.38 (0.18-0.79)**
Vaginal delivery	*yes*	**0.53 (0.33-0.85)**	-	
PFMT (2000-08)	*yes*	**0.21 (0.09-0.46)**	0.25 (0.03-2.36)	1.10 (0.01-83.26)
UI medical treatment (2000-08)	*yes*	-	-	2.26 (0.02-93.42)
UI surgery (2000-08)	*yes*	**6.62 (1.33-32.90)**	-	
POP surgery (2000-08)	*yes*	3.38 (0.61-18.73)	-	-
UI surgery (2000-2008)	*yes*	-	-	1.50 (0.08-26.96)
Hysterectomy (at baseline)	yes	-	-	0.44 (0.18-1.08)
Physical activity (at baseline)	*yes*	-	-	0.83 (0.42-1.67)

- *Only variables significant at 20% in the univariable analysis were included in each final model*

Regarding risks factors associated with incidence and remission of UI according to severity of UI using Sandvik score, results are presented in Table 3 and Table 4.

Table 3: Risk factors for incidence of UI according to severity of urinary incontinence (Sandvik score). Multinomial logistic regression

Variable		*Slight UI* adj OR (CI 95%)	*Moderate UI* adj OR (CI 95%)	*Severe UI + Very Severe UI* adj OR (CI 95%)
High school diploma	yes	**1.59 (1.01-2.49)**	0.79 (0.27-2.33)	4.53 (0.58-35.3)
Delta BMI (2000-08)	kg/m²	1.05 (0.95-1.16)	1.20 (0.98- 1.46)	0.96 (0.64-1.45)
Vaginal delivery	yes	**1.66 (1.00-2.76)**	0.80 (0.33-1.95)	0.32 (0.05-1.92)
UI surgery at baseline	yes	2.55 (0.97-6.67)	**4.93 (1.04-23.4)**	**69.9 (9.72-503.01)**
Physical activity	yes	1.41 (0.96-2.07)	2.20 (0.95- 5.07)	0.35 (0.05-2.29)
Major depression (CESD≥23 at baseline)	yes	1.20 (0.78-1.85)	0.50 (0.17- 1.49)	2.04 (0.33-12.6)

Table 4: Risk factors for remission of UI according to severity of urinary incontinence (Sandvik score) at baseline. Multinomial logistic regression

Variable		*Slight UI* adj OR (CI 95%)	*Moderate UI* adj OR (CI 95%)	*Severe UI+ Very Severe UI* adj OR (CI 95%)
Vaginal delivery	yes	0.66 (0.42-1.05)	3.10 (0.73-13.16)	1.68 (0.19-16.46)
PFMT (2000-08)	yes	6.42 (0.29-141.38)	2.47 (0.04-93.42)	0.72 (0.01-2903.14)
UI medical treatment (2000-08)	yes	1.84 (0.06-207.91)	0.92 (0.03-85.08)	21.31 (0.05-1792.29)
UI surgery (2000-2008)	yes	1.20 (0.07-18.04)	0.50 (0.17- 1.49)	**152.37 (19.01-1222.22)**

Interpretation of results

Ours rates of incidence of 22% and remission of 33 % are consistent with previous studies. The explanatory analysis regarding factors associated with incidence of UI and severity in a cohort of middle-aged women, found that an increase of BMI and depression at baseline are significantly associated with the rate of SUI. More over, surgical treatment of urinary incontinence seems to be an independent risk factor for mixed and urge urinary incontinence. Among patient with moderate and severe to very severe UI only a previous surgery for urinary incontinence is found to be significantly associated in our analysis. High rates of remission of all types of UI (stress, urge and mixed) confirm that UI is surely a more dynamic and a more complex phenomenon than suspected. The remission of SUI is might be able to occur more often than MUI or UUI. The analysis regarding factors associated with type of UI and severity in a cohort of middle-aged women, found that treatment have a different impact at long term. Indeed, whereas a surgery procedure during the follow-up is significantly associated with a greater remission SUI, pelvic floor muscle training is surprising associated with a lower remission of SUI. Overweight appears to be associated with a lower chance of remission of MUI. Among patient with severe to very severe UI only a previous surgery for urinary incontinence is found to be strongly significantly associated in our analysis.

Concluding message

Few is known about risks factors of urinary incontinence at midlife. Other longitudinal surveys are essential in order to confirm our results, and medical counselling. A surgical treatment of UI seems to be associated with de novo incidence of urge and mixed UI as well as a moderate to very severe Sandvik score of UI. A surgical treatment of UI seems to be associated with remission of SUI and remission of severe to very severe UI. Those results confirm long-term efficacy of a surgical procedure in women with SUI at midlife.

Disclosures

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