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Prevalence and risk factors of urinary incontinence in pregnancy

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ABSTRACT

Background: Urinary incontinence is a common symptom in pregnancy with a possible negative impact on the quality of life of the woman**.**

Objective: To determine the prevalence and incidence of risk factors for urinary incontinence in pregnancy.

Methodology: The research sample consisted of women aged 18 to 45 years. Data were obtained from 133 women in the third trimester of pregnancy using the Slovak validated version of the International Consultation on Incontinence Questionnaire - Short Form. The research was held in the Myjava Hospital between December 2013 and January 2014.

Results: Of the total number of respondents (n = 133) included in the study, 64.66% of women reported urinary incontinence during pregnancy. The most common type was stress urinary incontinence (73.26%). Urinary incontinence was more common in the group of secundiparas and multiparas, as well as in women with a history of vaginal delivery.

Conclusion: The study demonstrates a high prevalence of urinary incontinence in pregnant women. Urinary incontinence in pregnancy and parity may be risk factors for future development of urinary incontinence. The issue calls for adequate attention. In practice, this may involve educating pregnant women about prevention, risk factors, and management of a given type of urinary incontinence.

KEY WORDS

Urinary incontinence, pregnancy, risk factors

BACKGROUND

Urinary incontinence (UI) is defined as any involuntary leakage of urine. Urinary incontinence is a common symptom in pregnancy. The prevalence of UI during pregnancy varies. Multiple studies have explored the incidence of UI during pregnancy, and their results differ depending on the study and design methods used, the definition of UI, the questionnaires used to assess incontinence, and the stages of pregnancy studied (1). The prevalence of UI in pregnancy is reported to be between 30 and 60%, and increases during pregnancy. Prevalence also varies across pregnancy trimesters. While it is around 15 % in the first trimester, in the third trimester it can reach 80% (2). Urinary incontinence occurs in 3–8% nulliparas aged up to 35 years, yet in the case of primiparas, 23–70% suffer from urinary incontinence during pregnancy (3).

Urinary incontinence develops in pregnancy due to mechanical changes such as the pressure of the growing uterus on the bladder and pelvic floor muscles (increased intra-abdominal pressure on these structures), hormonal changes such as the muscle relaxation effect of progesterone, decreased epithelial proliferation due to decreased relaxin in the second half of pregnancy. Also significant are structural changes, namely changes in structure and reduction of collagen content in tissues. Other factors are contribute to the development of incontinence, such as parity (multiparas are more at risk) (4, 2). The exact causes of UI in pregnancy have not been identified, however (5).

Types of urinary incontinence (classification)

The following types of incontinence are defined:

• **Stress incontinence**, it is an involuntary leakage of urine associated with increased intra-abdominal pressure, with, for example, coughing or sneezing, lifting a load or physical activity, as a result of insufficient closing pressure in the urethra. It is the most common form of urinary incontinence in women. Stress incontinence stages are assessed in clinical practice with

the help of the Ingelmann-Sundberg classification (6). Stress urinary incontinence is divided into the following three stages based on severity:

– Stage I (mild form) - leakage of urine at a sudden, large increase in intra-abdominal pressure (cough, sneezing),
– Stage II (moderate form) - leakage of urine at a slight increase in intra-abdominal pressure (going up or down stairs, light physical work),
– Stage III (severe form) - urine leaks with the slightest physical effort or leaks continuously, out of control (1, 7). The disadvantage of the classification is the fact that it is subjective. It is thus recommended to classify incontinence by using questionnaires and methods to objectively determine the amount of leaked urine, which is carried out by medical specialists (8).

• **Urgent incontinence** (includes overactive bladder (OAB) is defined by an urgency symptom, as the urge to urinate. If accompanied by leakage of urine, it is urgent urinary incontinence. Other symptoms include frequent urination (pollakiuria), where an individual goes to urinate more than 8 times a day, and nocturnal urination (nocturia), where every episode of urination that interrupts sleep is reported (1).

• **Mixed incontinence**, is a combination of stress and urgent incontinence (1).

• **Other,** other forms of incontinence, which require the specification of circumstances under which urine leaks (1).

The most common type of incontinence during pregnancy is the stress urine incontinence (SUI) (9). Stress urinary incontinence may present as early as the 16th week of pregnancy, although it is most common in the third trimester (4). The pregnant suffer less often from urgency and urgent incontinence.

Urine leakage irritates the vagina, which may cause inflammation and itching. Other problems may include skin irritation, infections, and eczema. In addition, women who suffer from stress incontinence are at greater risk of bladder inflammation, as the constant moisture and subsequent washing remove healthy, infection-preventing bacteria from the vagina. Women suffering from UI are most afraid of emitting unpleasant odour or soiling their clothing (10). As urgent incontinence during pregnancy is a problem which may negatively affect a woman's quality of life (11, 12), women need to be monitored throughout pregnancy.

AIM

The main aim of the study was to screen for urinary incontinence and associated risk factors in pregnant women.

METHODOLOGY

The research sample comprised 133 respondents aged 31 years on average (SD ±} 3. 95). The respondents were selected based on the following classification criteria: 18–45 years old, between 36 weeks of pregnancy to delivery, a signed informed consent, and willingness to complete the questionnaire. Most respondents were aged 30 to 44 years (45.86%). The majority of women had tertiary education (45.86%) and secondary education (41.35%).

The research design corresponds to a cross-sectional quantitative study based on a questionnaire survey. The Slovak validated version of the International Consultation on Incontinence Questionnaire Short Form (ICIQ-UI-SF), serving to screen for the symptoms of urinary incontinence, was used to collect relevant data and achieve the set goal. Rather than a UI diagnosis tool, the ICIQ-UI-SF is an instrument allowing patients to evaluate their difficulties (13). The questionnaire had two parts.

Part One dealt with the stage and frequency of urine leakage, as well as the impact urine leakage has on quality of life. It contained the following items:

• Item 3: *How often do you leak urine?* never [0] – about once a week or less often [1] – two or three times a weee [2] – about once a day [3] – several times a day [4] – all the time [5].

• Item 4: *We would like to know how much urine you think leaks. How much urine do you usually leak (whether you wear protection or not)?* none [0] – a small amount [2] – a moderate amount [4] – a large amount [6].

• Item 5: *Overall, how much does leaking urine interfere with your everyday life?* Please ring a number between 0 (not at all) and 10 (a great deal) 0 1 2 3 4 5 6 7 8 9 10 not at all a great deal.

We evaluated these items in line with the ICIQ-UI-SF scoring system, where we measured the total score of items no. 3, 4, 5. The final score between 0 to 7 points indicated Stage I Stress UI, 8–14 points indicated Stage II Stress UI, and 15– 21 points indicated Stage III Stress UI (14, 15).

In the second part we divided symptoms into UI types based on the International Continence Society (16). We defined the symptoms of Stress UI as leakage while coughing or sneezing, lifting objects, laughing

or exercising. Urine leakage with a sudden feeling of a full bladder or when toilet was unavailable was considered Urgent UI. Women who reported symptoms of both Stress and Urgent UI were defined as cases of Mixed UI. The remaining responses to this question were grouped under Other.

The questionnaire also included questions about UI risk factors (number of births, history of Caesarean section, diabetes mellitus, smoking, chronic cough, constipation, smoking before pregnancy, and smoking during pregnancy). Respondents answered yes/no to these questionnaire items.

Data were analyzed using descriptive statistics. The comprehensibility of the questionnaire was verified by a pilot study with 10 pregnant women, addressed on the basis of personal contacts. The approval of the ethics committee of Myjava Hospital was obtained before the survey. The questionnaires were distributed and administered personally in Myjava Hospital. Pregnant women undergoing cardiotocographic examination were addressed personally. They signed an informed consent to participate in the study and were subsequently instructed how to complete it. Of the 150 surveys we distributed, we had 135 responses, of which only 133 could be used. The response rate of the surveys was 90 %. A total of 133 surveys were processed for the purposes of the study. The research data were collected between December 2013 and February 2014.

RESULTS

Based on the ICQ-UI-SF questionnaire, we found that out of 133 pregnant women in the 3rd trimester of pregnancy, 64.66% reported problems with urinary leakage (Table 1).

By analyzing the results according to the type of urinary incontinence, we found that the most common symptoms in 73.25% of pregnant women were those of stress urinary incontinence. The urgent type of urinary incontinence was identified in 15.12% of respondents, while 11.63% of pregnant women reported another type of urinary incontinence. Of all respondents who reported problems with urinary leakage (n = 86), 68.61% of pregnant women had a small amount of urine leakage. A moderate amount of leaked urine was reported by 20.93% of pregnant women. In terms of the frequency of urine leakage, the majority of the pregnant women (50%) leaked urine once a week. The impact on quality of life, assessed based on ICIQ-UI-SF responses, shows the average 3.70 points for all pregnant women with incontinence (n = 86) (Table 2).

After calculating the ICIQ-UI-SF score, we found that 40 pregnant women (63.49%) suffered Stage I Stress UI based on subjective assessment of UI symptoms, 23 women (36.51%) had Stage II Stress UI, and no woman suffered from Stage III Stress UI (0.00%) (Table 2).

Table 1 Problems with urine leakage

	n	%
Yes	86	64.66
No	47	35.34

Legend: n – absolute number, % – relative number

Table 2 Description of the group of respondents suffering from urine leakage

Type of urine incontinence	**n = 86**	**%**
Stress	63	73.25
Urgent	13	15.12
Mixed	0	0.00
Other	10	11.63
Amount of urine leaked	**n = 86**	**%**
Small	59	68.61
Moderate	18	20.93
Large	9	10.46
Frequency of urine leakage	**n = 86**	**%**
Once a week or less	43	50.00
Twice or three times a week	21	24.42
Once a day	7	8.14
Several times a day	13	15.12
All the time	2	2.32
Interference of urine leakage with everyday life	**n = 86**	**%**
0 – not at all	0	0.00
1	19	14.29
2	17	12.26
3	11	8.27
4	11	8.27
5	10	7.42
6	5	3.76
7	3	2.56
8	5	3.76
9	3	2.56
10 – a great deal	2	1.51
Stress UI stage based on ICQ-UI–SF final score	**n = 63**	**%**
Stage 1	40	63.49
Stage 2	23	36.51
Stage 3	0	0.00

Legend: n – absolute number, % – relative number

In terms of parity, the incidence of UI symptoms in women who had not given birth was 12.79%. In the group of women who had given birth once or more times, UI symptoms were detected in 87.21% of pregnant women (Table 3). Urinary incontinence was recorded in more than half of respondents (47.12%) with a history of vaginal delivery. Although other risk factors for UI (constipation, chronic cough, smoking before and during pregnancy, diabetes mellitus) were noted in women in the UI group, they concerned less than one third of the women (Table 3).

Table 3 Risk factors for UI

	UI symptoms		No UI symptoms	
Parity	**n = 86**	**%**	**n = 47**	**%**
Never	11	12.79	18	38.30
Once	32	37.21	14	29.79
Twice and more times	43	50.00	15	31.91
Constipation				
Yes	25	18.80	10	7.52
No	61	45.86	37	27.82
Chronic cough				
Yes	13	9.77	10	7.52
No	73	54.89	37	27.82
Smoking before pregnancy				
Yes	13	9.77	12	9.02
No	73	54.89	35	26.32
Smoking during pregnancy				
Yes	13	9.77	12	9.02
No	73	54.89	35	26.32
DM therapy				
Yes	10	7.52	10	7.52
No	76	57.14	37	27.82
Previous delivery	**n = 59**		**n = 45**	**%**
Vaginal	49	47.12	15	14.42
Caesarean	10	9.62	30	28.84

Legend: n – absolute number, % – relative number

DISCUSSION

The main aim of this study was to determine the prevalence and risk factors of UI during pregnancy, as this phenomenon is common in pregnancy.

We found based on the ICQ-UI-SF that 64.66% respondents of our group of pregnant women in the third trimester of pregnancy reported urinary leakage. The finding corresponds to similar studies, which show a prevalence ranging from 18.60 to 75% (17, 18, 19, 20). The differences are possibly due to different methodologies used to assess urinary incontinence, the different stages of pregnancy in which UI was monitored, and the influence of various genetic or environmental factors (18).

The International Continence Society distinguishes urinary incontinence based on symptoms as Urgent, Stress, Mixed, and Other incontinence (21, 14). In our study, we found that 73.25% pregnant women leaked urine in connection with increased intrinsic pressure, such as coughing, sneezing, physical activity/exercise. Symptoms of Urgent UI were reported by 15.12% of pregnant women, of Other UI by 11.63% of women, and Mixed UI was not reported by pregnant women at all. Pregnant women are more likely to suffer from SIM. The prevalence of stress urinary incontinence in pregnancy ranges from 8% to 85%, and usually subsides after delivery (17, 18, 22).

In terms of the frequency of urine leakage, 15.12% of the respondents in our study reported to leak urine several times a day. Over eight per cent (8.14%) of respondents report to leak urine once a day, 24.42% twice or three times a week, and 50% of respondents report urine leakage once a week and less.

Assessment of the amount of leaked urine revealed that in our group of respondents suffering from urine leakage (n = 86), up to 68.61% of respondents leaked a small amount of urine, 20.93% a moderate amount, and 10.46% respondents reported a large amount of leaked urine. Our findings are similar to the results of the study (23). The majority of respondents (59.7%) in the Turkish study reported a moderate amount of leaked urine (17). Urinary incontinence leads to, for most women, a lower quality of life in all areas. Women do not discuss the problem openly in public nor in private. They often withhold urine leakage even from their doctor, considering this to be too intimate, something they need to deal with on their own (24). Despite this, the authors claim that pregnant women do not attach great importance to urinary incontinence in pregnancy and consider UI integral to pregnancy (19). Our results suggest that patient attitudes to urinary leakage vary (Table 2).

The average score the respondents gave the interference of urine leakage with everyday life was 3.7 on a 10-point scale, where 10 equalled substantial interference. The quality of life of pregnant women was affected, as in a similar study, only minimally by UI (19). Yet we believe that problems with urine leakage need to be addressed as soon as possible. Therapy should aim to strive to improve the quality of life of a woman with UI. It is important to focus on respecting the dignity and well-being of a woman suffering from UI (24). One way is due feminine hygiene,

which may alleviate the discomfort (25) felt with the various types of UI.

The severity of urinary incontinence is assessed in clinical practice by the Ingelmann-Sundberg classification of SUI, which distinguishes the following three stages of Stress Urinary Incontinence.

At **Stage I**, urine dripping with coughing, laughing, sneezing, and lifting heavy objects. Urine leaks only in situations associated with a relatively sudden increase in intra-abdominal pressure. Urine only leaks intermittently.

At **Stage II** urine leaks in situations with a significantly milder increase in intra-abdominal pressure compared to Stage I. Urine leakage is associated with running, walking, going up/down stairs, and light physical work.

At **Stage III**, urine leaks with even minimal increase in intra-abdominal pressure (including the transmission of pressure changes when breathing deeper). Patients leak urine permanently when walking slowly or simply while in an upright position (26). After calculating the ICQ-UI-SF score, we found that out of the 63 women with symptoms of stress UI, 63.49% of women probably had Stage I, 36.51% Stage II, and no woman Stage III.

Further research is required to determine the extent to which this is a subjective assessment of the symptoms by pregnant women, and to objectify the data and specify the stage and type of UI. Literature mentions several risk factors contributing to urinary incontinence. A significant risk factor for urinary incontinence is for example the number of deliveries. Parity is reported to increase the risk of UI. UI rates are lower in women who have never given birth, and are higher for women who have given birth four or more times. In our study, 12.79% respondents who had never given birth had problems with urinary incontinence. Of respondents who had given birth once or more times, 87.21% reported to suffer from urinary incontinence (Table 3). Childbirth can weaken or damage the pelvic floor structures and innervate the urinary sphincter mechanism (13). In our study, UI was observed more frequently in women who had a history of vaginal delivery. Although our results cannot be attributed to the fact that UI in this group of women had developed in relation to a previous vaginal delivery, in our opinion attention should be paid to types of delivery and to gentle management of vaginal delivery, including due treatment of the birth canal. Excessive intra-abdominal pressure develops mainly in connection with chronic constipation, respiratory diseases, and smoking and coughing (27, 28). In our study, 18.80% women who suffered from urinary leakage reported constipation. Chronic cough was recorded in 9.77% of pregnant women with UI in our study. Some of the previous studies highlighted the link between UI and smoking (29). Pre-pregnancy smoking was admitted by 9.77% women with UI, and the same percentage of women with UI reported to have smoked during pregnancy. It is necessary to develop a strategy in health education to reduce smoking in pregnancy, as well as after pregnancy (30), in order to minimize the risk of UI. Gestational diabetes mellitus (GDM), as well as diabetes mellitus, are considered to be important risk factors for post-delivery UI (28, 31). Women who had GDM during pregnancy developed symptoms of Stress UI up to 2 years after delivery, compared with women without GDM. Symptoms of Urgent or Mixed UI persisted for up to 6 months after delivery. In our study, 11.63 % of the women within the UI group, had been treated for diabetes mellitus during pregnancy. We believe that pregnant women need to be given due attention and be instructed about UI prevention.

LIMITS

The results and findings above need to be considered in view of the limits of our research. Its non-probability sampling design is a limitation, which narrows the interpretation and generalization of the conclusions to the given sample only. Another limit to the study is the fact that it was a single cross-sectional study. It would be best to conduct a prospective study, namely to survey the same women three times, in the first, second, and third trimester of pregnancy. We could thus compare the same sample of women in different pregnancy stages, and the results would be more reliable. In addition, our study is partial, as it was carried out in one hospital only. As the ICIQ-UI-SF is not a diagnostic measure, as it is an instrument which allows women themselves to evaluate their difficulties, it should be complemented with other UI objectivization methods. In spite of the limitations, we are of the opinion that the study has yielded interesting results.

CONCLUSION

Urinary incontinence is common in pregnancy and the prevalence of UI is high, as confirmed by the results of our study. The subjective evaluation of respondents in the third trimester of pregnancy revealed Stress Incontinence to be the predominant type, which may be partly caused by the pressure of the growing uterus. Urine leakage differed in severity, with the most prevalent being leakage of a few drops of urine, which may escape the woman's attention. UI was more common in women who had given birth

once or more times and in women with a history of vaginal delivery. Urinary incontinence during pregnancy may be a risk factor for future urinary incontinence. The issue of urinary incontinence calls for adequate attention. In practice, it is necessary to identify pregnant women at high risk of developing urinary incontinence. Furthermore, all pregnant women should be educated about prevention, possible UI risk factors, and in case of symptoms of urinary incontinence, about treatment options for urinary incontinence. If adequately educated, a pregnant woman can implement effective measures to prevent UI during pregnancy and continue after delivery, thus minimizing the development of UI after delivery.

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