Urinary incontinence in women with low back pain

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Abstract

Urinary incontinence (UI) is a common female dysfunction, affecting women in all ages. Experienced physiotherapists and experts on low back pain (LBP) have since long observed and discussed the empirical association between LBP and UI. The aim of this study was to describe the occurrence of UI in women with LBP and to compare this group with a reference group of comparable age, language, culture and parity. The authors of this study had previously collected all original data from the reference group. A validated questionnaire concerning UI was answered by 200 consecutive women with LBP visiting specialised physiotherapy clinics in the area of Stockholm. Inclusion criteria were LBP, female, not pregnant, Swedish speaking, age between 17 and 45 years. Seventy-eight percent of the women with LBP reported UI. In comparison with the reference group, the prevalence of UI and signs of dysfunctional pelvic floor muscles (PFM) were greatly increased (p < 0.001) in the LBP group. Logistic regression analysis showed that the condition LBP and PFM dysfunction i.e. inability to interrupt the urine flow (p < 0.001) were risk factors for UI irrespective of parity. Physiotherapists treating patients with LBP should be aware of possible incontinence problems in this patient group.

Keywords: Female urinary incontinence; Low back pain; Pelvic floor dysfunction

1. Introduction

Urinary incontinence (UI) is a common condition in women (Hunskaar et al., 2000, 2003). The prevalence of UI increases with age, for young adults the prevalence is reported to be 20–30% and around middle age 30–40% (Hannestad et al., 2000; Hunskaar et al., 2003). The prevalence of UI has, however, varied with the populations studied and the definitions and methods used.

UI is since 2002 categorised as “the complaint of involuntary leakage of urine” (Abrams et al., 2002). This definition has replaced the former definition of the International Continence Society (ICS); “Involuntary loss of urine, which is objectively demonstrable and a social or hygienic problem” (Abrams et al., 1988). The most frequent form of UI in women is stress urinary incontinence (SUI), categorised as “the complaint of involuntary leakage on effort or exertion or on sneezing or coughing”. Urge urinary incontinence (UUI) is categorised as “the complaint of involuntary leakage accompanied by or immediately proceeded by urgency” (Abrams et al., 2002) and has been more frequently reported in elderly women (Hunskaar et al., 2000). Since 2002 (Abrams et al., 2002) UI and urinary leakage (UL) are mostly used synonymously.

Age, childbirth, lower urinary tract infections, pelvic surgery and factors increasing the intraabdominal pressure (IAP) such as overweight, straining at stool and physical exertion are traditionally considered to be risk factors for UI, alone or in combination (Hunskaar et al., 2000). The condition of the pelvic floor (PF) and particularly the pelvic floor muscles (PFM) are considered to be of importance (DeLancey, 1994), although no single factor completely explains UI aetiology.

The association between the PFM and abdominal muscle activity has been suggested in former physiotherapeutic research (Wennergren et al., 1991) and activity in the PFM is associated with abdominal muscle activity...
in general (Hemborg et al., 1985; Bö and Stien, 1994). From that point of view, the PFM are part of the muscles surrounding the abdomen and necessary for development of IAP (Hemborg et al., 1985). Recent research has furthermore confirmed a synergistic response between the deep abdominal muscles and the PFM (Sapsford et al., 2001; Neumann and Gill, 2002).

Hence, the PFM seem to be an integral part of trunk and lumbo-pelvic stability, in addition to contributing to continence (Richardson et al., 1999). In healthy people, control of increased IAP is performed automatically as a feed-forward loop via the recruitment of the M Transversus Abdominis (TrA) together with the diaphragm and the PFM (Hodges and Gandevia, 2000; Sapsford et al., 2001) and lack of this early muscular recruitment is believed to cause instability in the trunk. Recently, Pool-Goudzwaard et al. (2005) reported symptoms of PF dysfunction and UI in women with post-pregnancy instability and pain in the pelvis.

Low back pain (LBP) has been defined as a condition of pain localised to the lumbar spine with or without radiation to the hip or leg (Waddell, 1996), which can be the result of several concurrent conditions whose aetiology is unknown. Experienced physiotherapists and experts on LBP have since long observed and discussed the empirical association between LBP and UI, while also observing the benefits of the muscular stabilisation treatment on both LBP and UI (Richardson et al., 1999).

Hypothetically, there might exist a relationship between LBP and UI but research regarding the relationship between UI and LBP is scarce. To our knowledge there are no studies describing the occurrence of UI in women with LBP.

The aim of this study was therefore to describe the occurrence of UI in young women visiting physiotherapy clinics for treatment of LBP and compare the results with a reference group.

2. Material and methods

2.1. The study group

Physiotherapy clinics in the Stockholm area specialising in musculoskeletal disorders were contacted by telephone and nine clinics agreed to participate. Participation included distribution of written information on the study and a questionnaire to be handed out to the women who met the inclusion criteria.

The inclusion criteria were female, seeking physiotherapy for LBP, not pregnant, Swedish speaking, aged between 17 and 45 years.

The first 200 women who agreed to participate and who answered the questionnaire (see below) were included in the study. Seven women declined participation.

The physiotherapists were also asked to collect the completed questionnaires and record the number of patients who declined participation. The information letter stated that participation was voluntary and anonymous, and that the women could decline participation without any effect on their physiotherapy treatment and care. The completed questionnaire was put into an envelope, which was sealed by the patient before being given to the physiotherapist.

The Ethics Committee at Karolinska Hospital, Stockholm, Sweden, approved the study.

2.2. The reference group

In a prospective questionnaire study of 725 primiparous women with a mean age of 28 (range 17–43) years in Stockholm, the prevalence of UI before and during pregnancy and one year postpartum was surveyed (Eliasson et al., 2004, 2005). Before pregnancy the prevalence of UI was found to be 39%. Two percent of the women could be categorised having a more severe “significant UI” according to the former definition of UI (Abrams et al., 1988), and most of them reported SUI. One year postpartum, the prevalence rates had increased to 49% and 7%, respectively (Eliasson et al., 2005). Risk factors significantly associated with UI were found to be: connective tissue disorders, high impact physical activity, pelvic load, symptoms of dysfunctional and micturition habits (Eliasson et al., 2004, 2005).

2.3. Questionnaire

The same questionnaire, used for the reference group (Eliasson et al., 2004, 2005), was answered by the 200 women with LBP.

The questionnaire consisted of demographic questions and questions concerning etiological medical factors, UI, physical activity and micturition habits.

The validity and reliability concerning the questions used and analysed in these studies were found to be good (≥90% agreement) (Nordlander, 1994).

Some questions concerning pregnancy and delivery were not considered relevant to this study and were excluded, while questions concerning LBP were added. The revised questionnaire was tested on five women aged 20–45 years.

2.4. Data analyses

In the reference study the former definitions of the ICS were used (Abrams et al., 1988) but in the current study the new definition of UI (Abrams et al., 2002) was used and to describe a more severe leakage the expression “significant UI”.

UI was categorised as a positive response to the initial questions “Have you experienced UL?” with the
alternatives occasionally, several times and often, and “Do you experience UL today” with the same alternatives.

SUI was categorised as a positive response to the question “Do you leak urine during coughing, sneezing, lifting or physical activities?”

UII was categorised as a positive response to the question “Do you experience UL on your way to the bathroom?”

Mixed urinary incontinence (MUI) was categorised as a positive response to both questions concerning SUI and UII.

Those who answered “no” or failed to answer but answered affirmatively regarding leakage occasions and type of leakage were categorised as having UI.

“Significant UI” was defined according to the ICS definition (Abrams et al., 1988), including a positive response to the question “Do you leak more than a few drops”, and a positive response to one of the questions “Do you use sanitary pads due to your leakage?”, “Does leakage have a negative impact on your social life?” and “Does leakage have an impact on your psychological well-being?”

Recurrent LBP was categorised as a positive response to the question “Have you experienced repeated periods of LBP?”

Regular physical activity/exercise was categorised as a regular activity performed every week. The authors classified the physical activity according to its impact (loading effect) on the PF. Low impact activities were walking, bicycling, swimming and horseback riding. High impact activities, i.e. activities that raise the intra-abdominal pressure and thus exert great force on the PF, were: gymnastics, running, jumping, dancing and ball sports.

Due to the study population of patients with LBP, strength training was classified as low impact activity forming a natural part of the physiotherapy treatment.

Overweight was categorised as a Body Mass Index (BMI) $\geq 25$ kg/m$^2$ and obese $\geq 30$ kg/m$^2$ (WHO, 1997).

2.5. Statistical analysis

Results are presented as absolute and relative numbers. Univariate analyses using the Chi-square test were performed to test etiological factors and possible risk factors between continent and incontinent women with LBP. Univariate analyses using the Chi-square test were performed comparing the LBP group with original data from the reference group (Eliasson et al., 2004, 2005), separately according to parity. Data from the reference group and the study group were then included in the same data file for analysis. Significant variables from these Chi-square tests were entered in multiple backward logistic regression analyses in order to find the most important predicting factors for UI. Variables in the regression model were removed in order of highest $p$-value. Remaining variables were significant at $p < 0.05$. The multiple logistic regression analyses were performed for nulliparous and parous women separately. For the statistical calculations, Statistica 7.1 and SOLO Statistical System 4.0 have been used.

3. Results

3.1. Demographics for women with LBP

A total of 200 women answered the questionnaire. Their mean age was 36 (range 17–45) years. The majority of the women with LBP reported recurrent LBP (87%). Thirty-two percent ($n = 63$) were nulliparous with a mean age of 30 (range 17–45) years and 68% ($n = 137$) were parous with a mean age of 36 (range 21–45) years, whereas 28 had delivered two, and one women three children. Of the parous women, 88% ($n = 120$) had vaginal deliveries.

BMI averaged 24 (range 14–41) kg/m$^2$. Thirty-one percent were overweight and 9% were obese. Forty-five percent reported university studies and 39% hard work including heavy lifting. Twenty-four percent reported a chronic disease (most frequent were asthma and hypertension). Seventy-nine percent ($n = 158$) of the women exercised regularly, 27% with high impact (most frequent; aerobics and jogging) and 73% with low impact activities (most frequent; walking and strength training).

3.2. Prevalence of UI in women with LBP

Seventy-eight percent ($n = 155$) of the women with LBP reported UI, of whom 73% occasionally, 23% several times and 4% often. Twenty-three percent ($n = 46$) of the women could be classified as having “significant UI”. Nineteen percent used sanitary pads because of the leakage. Thirty-two percent were affected in their daily life, and 45% were psychologically affected.

Of the 155 women with UI, 72% reported SUI, 1% UUI and 27% MUI. Seventy-seven percent reported UI when coughing, 45% when laughing, 39% when exercising, 30% during heavy lifting and 27% on their way to the bathroom.

Nullipara did not report significantly less UI compared with parous women, and parous women, delivered vaginally, did not report significantly more UI than women delivered by Caesarean section.

The prevalence of UI was 79% in women with recurrent LBP ($n = 173$) and 65% in women with occasional LBP ($n = 26$). In the “significant UI” group ($n = 46$), 93% ($n = 43$) reported recurrent LBP.

Univariate analyses with respect to UI for the women with LBP are presented in Table 1 and prevalence rates for nullipara and para, respectively, in Table 2.
3.3. Comparison with the reference group

Women with LBP were 36 years of age versus 29, and they reported a higher educational level than the reference group \( (p < 0.001) \). Differences in other variables between the women with LBP and the reference women when they were nulliparous and parous are shown in Table 2.

The women with LBP reported significantly more UI \( (p < 0.001) \) and more “significant UI” \( (p < 0.001) \) than the reference group, and this applied to nulliparous as well as parous women (Table 2). Nulliparous women with LBP reported more MUI \( (p < 0.001) \) than the reference group.

The multiple logistic regression analyses revealed that suffering from LBP and inability to interrupt the urine flow significantly increased the risk for UI in both the nulliparous (Table 3) and parous groups (Table 4).

4. Discussion

In this explorative study including 200 women visiting physiotherapy clinics for treatment of LBP, the prevalence of UI as well as the rates of “significant UI” showed to be higher compared with the reference group, and the statistical analysis showed that the condition LBP increased the risk for UI almost three times for parous women, and even more for nulliparous women. The prevalence of UI was extremely high, and has previously only been seen in studies of elderly women (Hellström et al., 1990; Sandvik et al., 1995) and trampolinists at the elite level (Eliasson et al., 2002), who load their PF extremely.
A cross-sectional study design was chosen, as our intention was to explore whether UI was present in a group of younger women with LBP. There are studies within this topic reporting UI as side-tracks (Eisenstein et al., 1994; Dangaria, 1998; Pool-Goudzwaard et al., 2005) but no cross-sectional studies. This is a new research area and our study is a first attempt to describe whether women with LBP suffer from UI more or less than ordinary women, or the same. A comparison with the reference group revealed that the findings should be followed up in a larger epidemiological population study. Recently, Smith et al. (2006) found, when they analysed data from an Australian study on women’s health, that disorders of breathing and continence had an association with self-reported back pain in 38,050 women. However, in our study the diagnosis of LBP was established, and the women were referred to a specialised physiotherapist.

A limitation in this study was lack of information as to whether the reference group suffered from LBP. There were some differences between the study samples. Most of the women in the parous LBP group had delivered one or two children, in comparison with the corresponding reference group, where the women had delivered one child (Eliasson et al., 2005). However, childbirth per se was not associated with UI, nor was the mode of delivery. There are diverging opinions on childbirth as a risk factor for UI. Most studies report that UI is most likely to occur in parous rather than nulliparous women (Jolleys, 1988) with an increased risk for every vaginal delivery (Jolleys, 1988). However, Thomas et al. (1980) found UI to be most common in parous women, but not until after four or more children, while in a recent Swedish study, Uustal Fornell et al. (2004) found an increased risk after more than two children. Overweight is reported to be a risk factor for UI (Dwyer et al., 1988; Hunskaar et al., 2000). The LBP group was more overweight ($p < 0.001$), but overweight did not influence the prevalence of UI neither in this study nor in the reference study (Eliasson et al., 2004, 2005). Hence, we do not regard differences between the LBP group and the reference group as responsible for the higher leakage rates in women with LBP.

Surprisingly, women with LBP were significantly less able to interrupt the urine flow than women in the corresponding reference group (Table 2). In earlier studies (Eliasson et al., 2004, 2005), this inability has been reported to be closely associated with UI. This association was further evident in the present study, where the statistical analysis found inability to interrupt the urine flow to be a strong predictor of UI.
increasing the risk four times for parous and twice for nulliparous women. Whether this aggravated dysfunction in the study group is due to LBP or not might be discussed, and if so, the causes could be delay in the muscular reaction or pain inhibition—present, former or both. The timing of the PFM response in relation to increases in IAP is probably more important than the strength of the PFM in promoting continence (Deindl et al., 1993).

Another sign of dysfunctional PFM was perceived pelvic load, significantly more reported by parous women with LBP than by the reference group. In the nulliparous group with LBP, every third woman reported this symptom. Due to lack of information from the nulliparous reference group this variable was, however, not included in the statistical analysis. Pelvic load is a symptom, described by women with genital prolapse, and has been found to be associated with decreased PFM strength (Samuelsson et al., 1999) and UI (Uustal Fornell et al., 2003; Eliasson et al., 2005). The question of whether subjectively reported pelvic load is another symptom of dysfunctional PFM due to LBP needs to be further illuminated.

Although stress symptoms still were dominant, nulliparous women with LBP reported urge symptoms significantly more often than the corresponding reference group and nulliparous women are usually not expected to exhibit this kind of symptoms. Interestingly, the association between LBP and urge symptoms has been reported previously (Eisenstein et al., 1994; Dangaria, 1998; Pool-Goudzwaard et al., 2005).

The differences between the groups have been assessed, with the result that it cannot be excluded that the variation of incontinence rates is due to the occurrence of LBP. However, further research is needed to evaluate the association between LBP and UI.

5. Conclusion

UI was reported by 78% of women with LBP. In comparison with the reference group, the prevalence of UI and “significant UI” as well as signs of dysfunctional PFM was greatly increased. Logistic regression analysis showed that suffering from LBP and inability to interrupt the urine flow increased the risk for UI irrespective of parity. Physiotherapists treating patients with LBP should be aware of possible leakage problems within this patient group.

References


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