

Prevalence Of Urinary Incontinence And Its Association With Risk Factors In Three Months Postpartum Women Attending MOH Clinics Registered Under Colombo Municipal Council During September And October 2019

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Abstract: Urinary incontinence (UI) is a common symptom after pregnancy causing distress, embarrassment among women and is often under reported due to misbeliefs, unawareness and shame. This study is aimed to determine the prevalence and risk factors of UI among three months postpartum women attending Maternity and Child Healthcare centres, registered under Colombo Municipal Council. A descriptive cross sectional study was carried out among three months postpartum women of age 18 - 45 who were recruited consecutively until the sample size of 420 was achieved. A questionnaire including demographic data and obstetric history was given and the "Questionnaire for Urinary Incontinence Diagnosis" (QUID) was given to diagnose the type of UI. The prevalence of UI out of the 420 participants was identified as 17.4%, stress urinary incontinence (SUI) as 6.0%, urge urinary incontinence (UUI) as 7.9% and mixed urinary incontinence (MUI) as 3.6%. The results of the Multinomial Logistic Regression test revealed that parity ($p=0.002$), first birth ($p=0.014$) and episiotomy ($p=0.004$) had a significant association with UI whereas head circumference ($p=0.016$), parity ($p=0.053$) and first birth ($p=0.023$) had a significant association with SUI. Parity ($p=0.002$) and the number of normal vaginal deliveries ($p=0.034$) had a significant association with UUI while BMI ($p=0.027$), first birth

($p=0.016$), episiotomy ($p=0.047$) and gestational DM ($p=0.030$) had a significant association with MUI. The prevalence of UI among three months postpartum women was 17.4% and UUI was the most prevalent. Parity, first birth and episiotomy were the risk factors that had a significant association with UI.

KeyWords: prevalence, urinary incontinence, risk factors

Introduction:

Urinary incontinence is a common stigmatizing condition among females which has a devastating impact on the quality of life this affecting their physical, psychological, social and economic wellbeing (Hunskar et al, 2004). A systematic review that was conducted among 33 population based studies concluded the global prevalence of UI in three months postpartum women to be 33% (Thom & Rortveit, 2010). Even though UI has social and cultural implications, limited studies have been conducted in Asian countries moreover this kind of a study has not been conducted in Sri Lanka. The aim of this study was to find out the prevalence of Urinary Incontinence and its association with risk factors for Urinary Incontinence among population.

Methodology

This research was a descriptive cross sectional study conducted among all eligible

three months' postpartum mothers who attended MOH clinics registered under the Colombo Municipal Council during September and October 2019. Three months postpartum women within the age range 18-45 years who were able to read and write were included in the study sample while three months postpartum mothers who suffered from urinary tract infections at the time of data collection and who had UI prior to pregnancy were excluded. Sample size was calculated using a standardised equation for sample size calculation as stated by Arifin (2013). Accordingly 420 three months postpartum mothers were recruited consecutively until the sample size was achieved.

Data were collected from two interviewer administered questionnaires. Initially a questionnaire inquiring demographic and clinical data was given; the validity of the questionnaire was assessed by three specialists experienced in Obstetrics and gynaecology. A Questionnaire for Urinary Incontinence Diagnosis (QUID) was used to diagnosed the type of UI, the questionnaire was validated by Bradely et al (2010) and translated by language specialists to Sinhala and Tamil and rechecked by subject professionals and was back translated. A pre-test was done for both questionnaires on ten three months postpartum women who attended the Kuppiyawatta MOH. All investigators were trained to interview the participants and one investigator was trained to measure the height and weight. Data were entered into Statistical package for Social Sciences (SPSS) version 23-computer software and analysed accordingly. Risk factors were analysed using Multi-nominal logistic regression (MLR).

Results

Descriptive details (mean, standard deviation, median, mode, minimum and maximum) of mother's age, mother's BMI, newborn's birth weight and head

circumference are shown in table 1. In reference to the descriptive statistics, the sample consisted of three months postpartum mothers between ages 18 to 42 years.

Table 1: Descriptive Details

Characteristics	Mean ± SD	Median	Mode	Max	Min
Age	28.01 ± 5.79	27.00	26	42	18
BMI	25.79 ± 5.00	25.75	24	51.3	14.8
Birth weight	2.90 ± 0.49	2.90	2.9	4.82	1.00
Head Circumference	32.78 ± 1.94	32.88	33	45	24

Prevalence of UI, SUI, UII

The prevalence of UI among the 420 three months postpartum mothers was 17.4% of which 6.0% (n= 25) was SUI, 7.9% (n=33) was UII and 3.6% (n=15) was MUI. The prevalence of three types of urinary incontinence as a percentage of the diagnosed women was 34.2% of SUI, 45.2% of UII and 20.5% of MUI. Multinomial logistic regression was performed on the current study to model the relationship between types of UI (SUI, UII, MUI) and its association with risk factors.

Parity (p=0.002), First Birth (p=0.014) and Episiotomy (p=0.004) were noted as the risk factors that had a significant association with UI.

Table 2: Parameter Estimates of the significant risk factors relative to the type of urinary incontinence

Type	Risk factors	B	Sig.
SUI	Head circumference	.342	.016
	Parity:		
	Primiparous	-1.189	.050
	Multiparous	0 ^b	
	First birth:		
	LSCS	-3.034	0.23
	NVD	0 ^b	

UII	Parity:		
	Primiparous	-1.790	.002
	Multiparous	0 ^b	
MUI	Number of NVD	.774	.034
	BMI	.133	.027
	First birth:		
	LSCS	3.393	.016
	NVD	0 ^b	
	Episiotomy :		
	Response – No	-2.023	.047
	Response – Yes	0 ^b	
	Gestational DM		
	Response- No	-1.334	.030
Response- Yes	0 ^b		

Discussion

In reference to the QUID scores, 73 mothers were diagnosed with urinary incontinence. The reported stress urinary incontinence prevalence was 6%, whereas urge urinary incontinence was 7.9% and mixed urinary incontinence was 3.6%. Accordingly, in contrast to many studies, this study reported urge urinary incontinence to be the most prevalent followed by stress urinary incontinence and mixed urinary incontinence.

The urinary incontinence prevalence in the present study was almost similar to the study by Boyles et al (2009) in Oregon, USA which was 17.1%, but lower than the study by Glazener et al (2006) which was conducted in Scotland and the meta-analysis by Tom and Rotreivet (2010) which was respectively 28% and 28.7%. In comparison to the prevalence of South Asian countries, the present study showed higher prevalence in respect to the study done in Karachchi, Pakistan by Ali, Lakhani and Sarwar (2013) which had the prevalence of 10.6% and a study done by Tanawattanacharoen and Thongtawee (2014) in Thailand which was 7.8%. A higher prevalence of urinary incontinence (20.3%) than the present study was reported in Indonesia by Fakhrizal et al (2016). Studies, which were reviewed, reported a wide variability of urinary incontinence depending on the ethnicity. A literature review done to identify the

association between UI in women and racial aspect reported that UI prevalence in general is higher in white and Hispanic women than among black and Asian women and that stress UI was more common in Hispanic women than the rest of the ethnicities (Leroy et al., 2012). (Sears et al, 2009) reported a significantly higher prevalence of stress incontinence among Hispanic women, followed by white, black and Asian women and a higher prevalence of urge incontinence among black women, followed by Hispanic, white and Asian women. This study conducted in Sri Lanka being a South Asian country reported higher prevalence in urge UI.

Studies conducted in Sri Lanka on urinary incontinence prevalence among general female population concluded that the most prevalent urinary incontinence type in Sri Lanka as urge urinary incontinence which was similar to the current study suggesting that ethnicity might be the reason (Pethiyagoda, Pethiyagoda & Manchanyaka, 2018; Pathiraja, Prathapan & Gunewardena, 2017). The research conducted in the Teaching Hospital, Peradeniya reported a prevalence of 4.8% for both UII and MUI whereas stress prevalence was 1.7% (Pethiyagoda, Pethiyagoda & Manchanyaka, 2018). Another study conducted using 2354 women (18-90 years) reported 10% of SUI, 29.9% of UII and 15.6% of MUI. The Colombo district analysis of this study reported 5.5% of SUI which is closer to the SUI prevalence in the current study (Hemachandra, Rajapaksa & Manderson, 2009).

Risk factors associated with UI

The maternal age range of the study was between 18 – 42 years with a mean age of 28.1±5.79 years. The results concluded that there was no association between the maternal age and type of UI which was similar to the study conducted by Pregazzi et al (2002) to assess the prevalence and risk

factors of three months postpartum women within the age range 19 – 44 years? Helena and Moraes (2016) concluded another study among mothers within the age range 13 – 45 (mean 25.9 ± 7.7 years) which also reported a similar outcome. In contrast to all above studies, Zhu et al (2012) and Macarthur et al (2015) have both concluded that the increase of maternal age increased the risk of having UI.

Next, the current study identified the mean BMI of three months postpartum mothers to be 25.79 ± 5.00 kgm⁻², which had no association with the types of UI. Helena and Moraes (2016) also had reported similar results in their studies, while Macarthur et al (2015) and Eftekhari et al (2006) reported controversial results, showing an association between BMI and UI. A case control study by Helena and Moraes (2016), Boyles et al (2009) and Tanawattanacharoen and Thongtawee (2014) stated that there was no association between the birth weight of the newborn and the prevalence of UI which supported the results of the current study (mean birth weight 2.9 ± 0.49 kg), but Glazener et al (2006) concluded that the baby's birth weight had a significant association with UI which was a contentious result for the current study.

Another factor analysed in the present study was head circumference of the newborn baby which had a mean of 32.78 ± 1.94 , the results revealed a significant association with SUI which was consistent with the study by Vikrupt (1992) but controversial with EPINCOT a study by Rortveit et al (2003) which showed a significant association with UUI. However, Pregazzi et al (2002) and Burgio et al (2003) interpreted a completely different outcome concluding that the head circumference had no association with UI.

Parity had been a significant risk factor that associated with UI Macarthur et al (2015), Helena and Moraes (2016) and Lin et al (2018) concluded parity as a significant

determinant of SUI. This was compatible with the findings of the current study, which reported a significant association between SUI and UUI in three months postpartum women. Pregazzi et al (2002) also reported similar results. In contrast, Tanawattanacharoen and Thongtawee (2014) concluded that the parity had no relationship with UI.

The current study also found that most of the mothers suffering from UI stated NVD as the mode of delivery of their first pregnancy which revealed that NVD being the mode of delivery of the first pregnancy to have a significant association with SUI and MUI which was supported in the EPINCOT study by Rortveit et al (2001). A longitudinal cohort study by Viktrup, Rortveit and Lose (2007) concluded that mode of delivery of the first pregnancy being LSCS seemed to reduce the risk of long term while Eason et al (2004) concluded that first birth being NVD as a risk to develop SUI.

Another factor that was analysed in the study was GDM, which showed no association with SUI or UUI but showed an association with MUI. A longitudinal cohort study by Chuang et al (2012) stated that GDM was a risk factor for postpartum UI irrespective of the type compared to women who didn't have GDM, but a few studies stated that there was no association between UI and GDM (Lin et al, 2018).

A case control study by Helena and Moraes (2016) assessed the risk factors, identified that women who had undergone vaginal delivery were at higher risk of developing UI than women who were submitted to LSCS. Burgio et al (2003) concluded that experiencing a NVD, doubled the risk of developing UI in the postpartum period and studies have also proposed that LSCS prevented muscular and nerve damage to the pelvic floor reduced the risk of developing SUI compared to NVD (Snooks et al, 1990). Many more studies have reported similar

outcomes in their conclusions. The current study was also in line with these results presenting and association between the number of NVD and UUI.

Finally, the results of the present study showed a significant association between episiotomy and MUI. Zhu et al (2012) concluded that episiotomy had a significant association with UI but in contrast, the study by Helena and Moraes, (2016) concludes that there is no association between MUI and episiotomy.

Conclusion

In conclusion, the present study identified the prevalence of UI as 17.4%, SUI as 6.0%, UUI as 7.9% and MUI as 3.6%. The most prevalent type of UI was UUI. The risk factors that had a significant association with UI were identified as Parity, First Birth and Episiotomy. SUI had a significant association with head circumference, parity and first birth whereas number of vaginal deliveries and parity showed a significant association with UUI while first birth, episiotomy and gestational DM showed a significant association with MUI.

References:

Ali, H.S., Lakhani, N.A. & Sarwar, N. G. (2013) Urinary incontinence three months after delivery; prevalence and risk factors. *Professional Med J.* [Online] 20(4), 530-536.

Available from:
<http://www.theprofesional.com/index.php/tpm/j/article/download/1095/848> [Accessed 10th April 2019].

Arifin, W. (2013) Introduction to sample size calculation. *Education in Medicine Journal.*

[Online] 5(2). Available from: doi: 10.5959/eimj.v5i2.130 [Accessed 10th May 2019]

Boyles, S. H., Li, H., Mori, T. & Boyles, H. (2009) Effect of mode of delivery on the

incidence of urinary incontinence in primiparous. *Obstet Gynecol.* [Online] 113(1),134-

141. Available from: doi: 10.1097/AOG.0b013e318191bb37 [Accessed 17th March 2019].

Bradley, C., Rahn, D., Nygaard, I., Barber, M., Nager, C., Kenton, K., Siddiqui, N., Abel,

R., Spino, C. & Richter, H. (2010) the questionnaire for urinary incontinence diagnosis

(QUID): validity and responsiveness to change in women undergoing non-surgical

therapies for treatment of stress predominant urinary incontinence. *Neurourology and*

Urodynamics.[Online] 29(5), 727-734. Available from: doi 10.1002/nau [Accessed 20th June 2019].

Burgio, K. L., Zyczynski, H., Locher, J. L., Richter, H. E., Redden, D. T. & Wright, K. C.

(2003) Urinary Incontinence in the 12-Month Postpartum Period. *Obstetrics &*

Gynecology.[Online]102(6), 30-32. Available from:

<https://doi.org/10.1016/j.obstetgynecol.2003.09.013> [Accessed 25th March 2019]

Chuang, C., Lin, I., Horng, H., Hsiao, Y., Shyu, I. & Chou, P. (2012) The impact of

gestational diabetes mellitus on postpartum urinary incontinence : a longitudinal cohort

study on singleton pregnancies. *An International Journal of Obstetrics and*

Gynaecology.[Online] 119(11), 1-10. Available from: doi: 10.1111/j.1471-0528.2012.03468.x [Accessed 10th December 2019]

Eason, E., Labrecque, M., Marcoux, S. & Mondor, M. (2004) Effects of carrying a

pregnancy and of method of delivery on urinary incontinence: A prospective cohort

study. *BMC Pregnancy and Childbirth.*[Online] 4 (1),1-6. Available from: 10.1186/1471-2393-4-4 [Accessed 20th May 2019].

Eftekhari, T., Hajibaratali, B., Ramezanzadeh, F. & Shariat, M. (2006) Postpartum

evaluation of stress urinary incontinence among primiparas. *International Journal of*

- Gynaecology and Obstetrics.[Online] 94(2), 14–118. Available from:doi:10.1016/j.ijgo.2006.04.042 [Accessed 20th July 2019]
- Fakhrizal, E., Priyatini, T., Santoso, B. I., Moegni, F., Djudas, S., Hakim, S. & Maryuni, S. W. (2016) Clinical Research Prevalence and risk factors of persistent stress urinary incontinence at three months postpartum in Indonesian women. *Medical Journal of Indonesia*. [Online] 25(3),163–170. Available from: doi: 10.13181/mji.v25i3.1407 [Accessed 13th March 2019].
- Glazener, C. M. A., Herbison, G. P., Macarthur, C., Lancashire, R., Mcgee, M. A. & Grant, A. M. (2006) New postnatal urinary incontinence : obstetric and other risk factors in primiparae. *An International Journal of Obstetrics and Gynaecology*. [Online] 113(2),208–217. Available from: 10.1111/j.1471-0528.2005.00840.x [Accessed 29th April 2019].
- Helena, M. & Moraes, B. De (2016) Risk factors for postpartum urinary incontinence. *Journal of School of Nursing, USP*. [Online]50(2) ,200–207. Available from:doi: 10.1590/S0080-623420160000200004 [Accessed 13th May 2019].
- Hemachandra, N., Rajapaksa, L. & Manderson, L. (2009) A “usual occurrence:” stress incontinence among reproductive aged women in Sri Lanka. *Social Science & Medicine*. [Online] 69(9), 1395-1401. Available from: doi:10.1016/j.socscimed.2009.08.019 [Accessed 25th February 2019].
- Hunskar, S., Lose, G., Sykes, D. & Voss, S. (2004) The prevalence of urinary incontinence in women in four European countries. *BJU International*. [Online] 93(3),324–330. Available from: doi:10.1111/j.1464-410X.2004.04609.x [Accessed 10th April 2019].
- Leroy, L. da S., Lopes, M. H. B. de M. and Shimo, A. K. (2012) *Urinary incontinence in women and racial aspects: A literature review. Texto e Contexto Enfermagem*. [Online] 21(3), 692–701. Available from: <https://doi.org/10.1590/S0104-07072012000300026> [Accessed 12th April 2019].
- Lin, Y., Chang, S., Hsieh, W. & Chang, Y. (2018) Persistent stress urinary incontinence during pregnancy and one year after delivery ; its prevalence , risk factors and impact on quality of life in Taiwanese women: An observational cohort study. *Taiwanese Journal of Obstetrics & Gynecology*. [Online]57(3) ,340–345. Available from: doi:10.1016/j.tjog.2018.04.003 [Accessed 18th February 2019].
- Macarthur, C., Wilson, D., Herbison, P., Lancashire, R. J., Hagen, S., Toozs-hobson, P. & Dean, N. (2015) Urinary incontinence persisting after childbirth : extent , delivery history , and effects in a 12 – year longitudinal cohort study. *An International Journal of Obstetrics & Gynaecology*. [Online] 123(6),1–8. Available from: doi: 10.1111/1471-0528.13395 [Accessed 1st April 2019].
- Pathiraja, R., Prathapan, S. and Gunewardena, S. (2017) Impact of urinary incontinence on quality of life of women in a community sample in three districts of Sri Lanka – a cross sectional study. *Sri Lanka Journal of Obstetrics and Gynaecology*. [Online] 39(3), 43. Available from: doi: 10.4038/sljpg.v39i3.7817 [Accessed 15th July 2019].
- Pethiyagoda, A. (2019) Prevalence of urinary incontinence in women; experience of single tertiary referral centre in Sri Lanka. *European Journal of Biomedical and Pharmaceutical Sciences*. [Online] 5(12),1–5. Available from: <https://www.ejbps.com> [Accessed 25th February].
- Pregazzi, R., Sartore, A., Troiano, L., Grimaldi, E., Bortoli, P., Siracusano, S. &

- Guaschino, S. (2002) Postpartum urinary symptoms : prevalence and risk factors. *European Journal of Obstetrics & Gynecology and Reproductive Biology*. [Online]103(2),179–182. Available from: doi: 10.1016/s0301-2115(02)00045-3 [Accessed 10th April 2019].
- Rortveit, G., Daltveit, A., Hannestad, Y. & Hunskaar, S. (2003) Vaginal delivery parameters and urinary incontinence: The Norwegian EPINCONT study. *American Journal of Obstetrics and Gynecology*. [Online] 189(5), 1268-1274. Available from: doi: 10.1067/s0002-9378(03)00588-x [Accessed 5th October 2019].
- Rortveit, G., Hannestad, Y. S., Daltveit, A. K. & Hunskaar, S. (2001) Age- and TypeDependent Effects of Parity on Urinary Incontinence. *Obstetrics & Gynecology*. [Online] 98(6), 1004–1010. Available from: doi: 10.1097/00006250-200112000-00004 [Accessed 24th May 219].
- Sears, C., Wright, J., O'Brien, J., Jezior, J., Hernandez, S., Albright, T., Siddique, S. & Fischer, J., (2009) The Racial Distribution of Female Pelvic Floor Disorders in an Equal Access Health Care System. *Journal of Urology*. [Online] 181(1),187-192. Available from: doi: 10.1016/j.juro.2008.09.035 [Accessed 26th May 2019].
- Snooks, S. J., Swash, M., Mathers, S. E. & Henry, M. M. (1990) Effect of vaginal delivery on the pelvic floor: A 5-year follow-up. *British Journal of Surgery*. [Online]77(12), 1358–1360. Available from: doi: 10.1002/bjs.1800771213 [Accessed 25th July 2019].
- Tanawattanacharoen, S. & Thongtawee, S. (2014) Prevalence of urinary incontinence during the late third trimester and three months postpartum period in King Chulalongkorn Memorial Hospital. *Journal of the Medical Association of Thailand*. [Online] 96(2), 144-9. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/23936978> [Accessed 26th February 2019].
- Thom, D. H. & Rortveit, G. (2010) Prevalence of postpartum urinary incontinence: A systematic review. *Acta Obstetrica et Gynecologica Scandinavica*. [Online] 89(12),1511–1522. Available from:doi: 10.3109/00016349.2010.526188 [Accessed 11th March 2019].
- Viktrup, L., Lose, G., Rolff, M. & Barfoed, K. (1992) The symptom of stress incontinence caused by pregnancy or delivery in primiparas. *Obstet Gynecol*. [Online] 79(6), 945-9499. Available from: <https://europepmc.org/article/med/1579319> [Accessed 10th March 2019].
- Viktrup, L., Rortveit, G. & Lose, G. (2007) Risk of stress urinary incontinence twelve years after the first pregnancy and delivery. *Obstetrical & Gynecological Survey*. [Online] 62(5), 305-306. Available from: doi: 10.1097/01.ogx.0000261649.71135.63 [Accessed 14th February 2019].
- Zhu, L., Li, L., Lang, J. & Xu, T. (2012) Prevalence and risk factors for peri- and postpartum urinary incontinence in primiparous women in China: a prospective longitudinal study. *International Urogynecology Journal*. [Online] 23(5), 563-572. Available from: doi: 10.1007/s00192-011-1640-8 [Accessed 14th February 2019].