ISSN No:-2456-2165

Prevalence of Urinary Incontinence and its Associated Risk Factors among Three Months Postpartum Women Registered under the Colombo Municipal Council, Sri Lanka

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Abstract:-
Background: Urinary incontinence is a common and distressing problem among females, which has a devastating impact on their quality of life.
Objective: To identify the prevalence of urinary incontinence and its associated risk factors among three months postpartum women registered under the Colombo Municipal Council, Sri Lanka. Method: A cross-sectional descriptive study was carried out in 14 MOH clinics registered under Colombo Municipal Council. Three months postpartum women between ages 18 -45 were recruited consecutively until the sample size of 420 was achieved. Three interviewer-administered questionnaires were used, a questionnaire including socio-demographic data and a "Questionnaire for Urinary Incontinence Diagnosis" (QUID). Results: The prevalence of UI out of the 420 participants was identified as 17.5%, SUI as 6.0%, UUI as 7.9% and 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. The test also revealed the risk factor that had a significant association with each type of UI. Head circumference (p=0.016), parity (p=0.050) 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. It was reported that 94.3% of the population were not aware about physiotherapy interventions. Conclusion: The prevalence of SUI among three months postpartum women was 6.0% while the most prevalent type of UI among this population was identified as UUI. Head circumference, parity and first birth were the risk factors that had a significant association with SUI.

Keywords:- *Urinary Incontinence, Three Months' Postpartum, Risk Factors.*

I. INTRODUCTION

Urinary incontinence is a common stigmatizing condition among females which has a devastating impact on the quality of life affecting their physical, psychological, social and economic well-being [1]. Milsom et al (1993) stated that more than 50% of these women do not seek help from medical professionals for this condition due to a number of reasons, which include misinterpretation of symptoms, misbeliefs, unawareness and shame. The International Continence Society defines stress urinary incontinence (SUI) as the complaint of involuntary loss of urine on effort and physical exertion including sporting activities, sneezing or coughing, urge urinary incontinence ((UUI) as the involuntary loss of urine associated with urgency and mixed urinary incontinence (MUI) as the complaint of both stress and urgency urinary incontinence.

A systematic review that was conducted among 33 population based studies concluded the global prevalence of three months postpartum women to be 33% and the most prevalent type of urinary incontinence was noted as stress urinary incontinence [2], whereas another research was carried out to estimate the prevalence of urinary incontinence among three months postpartum women in Pakistan which concluded the prevalence of urinary incontinence to be 10.6%, which was further elaborated stating that the prevalence of stress urinary incontinence was 53.3%, urge urinary incontinence was 20.66% and finally mixed urinary incontinence was 20% [3]. Although there wasn't research carried out in Sri Lanka among three months postpartum women to identify their prevalence of urinary incontinence prior to this study, it is essential to state that information available on urinary incontinence is limited among Asian countries and urinary incontinence is considered a condition having social as well as cultural implications indicates the need for more research to be conducted in this area. The aim of this study was to find out the prevalence of urinary incontinence and its associated risk factors among three months postpartum women registered under the Colombo Municipality Council, Sri Lanka.

ISSN No:-2456-2165

II. METHOD

A descriptive cross-sectional study was conducted among all eligible three months postpartum mothers who attended MOH clinics registered under the Colombo municipal council. Ethical approval was granted from the Ethical Review Committee (ERC), General Sir John Kotelawela Defence University and permission to conduct the study in MOH centres registered under Colombo Municipal Council (CMC) was obtained prior to the data collection. The inclusion criteria for the study were; the age range 18 – 45 years, mothers who were able to read and understand and if they were in the three months postpartum period at the time of the interview. Participants were excluded if they were suffering with urinary tract infection at the time of data collection, if they had urinary incontinence prior to pregnancy and if they were not psychologically fit at the time of data of collection.

The main aim of the data collection phase was to interview 420 mothers in the 3 months postpartum period. The sample size was calculated with the use of a standardised equation for sample size calculation as stated by Arifin (2013) [4]. The sample was recruited consecutively from the 14 MOH clinics registered under CMC during the months of October and November 2019 until the sample size was achieved. These clinics were selected based on the convenience of travelling and time given for data collection. The study used three interviewer administered questionnaires. The questionnaire includes demographic data and clinical data, and the Questionnaire for Urinary Incontinence Diagnosis (QUID) Mother's age, BMI, type of first birth , parity, presence of gestational DM, number of normal vaginal deliveries and number of LSCS deliveries ,newborn's birth weight and head circumference were documented in the questionnaire which included demographic and clinical data.QUID was used to diagnose the type of urinary incontinence and it was a specialized questionnaire to diagnose stress and urge UI in women compromising six questions of which the first three questions focus on diagnosing SUI and the last three on UUI. Each question consists of six responses and if the QUID score of first three questions were ≥4, they were diagnosed with SUI and if last three question summed up to be ≥6, they were diagnosed with UUI [5]. (Bradley et al, 2005). KHQ The validity of the questionnaire which included demographic and clinical data was assessed by three specialists experienced in Obstetrics and Gynaecology. The amendments were done accordingly, The Questionnaire for Urinary Incontinence Diagnosis (QUID) was validated by Bradley et al, 2005 [5], both questionnaires were translated by language specialists to Sinhala and Tamil and rechecked by subject professionals and was back translated. A pilot study was carried out on ten three months postpartum women who attended the Kuppiyawatta MOH.

Prior to data collection, All investigators were trained to interview the participants and one investigator measured the weight and height to calculate the BMI. Three months postpartum women who gave the consent and fulfilled the inclusion criteria were administered using the questionnaire which included demographic and clinical data followed by the QUID for the diagnosis. The fig: 1 summarizes the data collection procedure.

➢ *Data Analysis*

Data were entered into Statistical package for Social Sciences (SPSS) version 23-computer software and analysed accordingly. Prevalence was calculated using frequency distribution and risk factors were analysed using Multinominal logistic regression (MLR) as the dependent variable contained more than two categories.

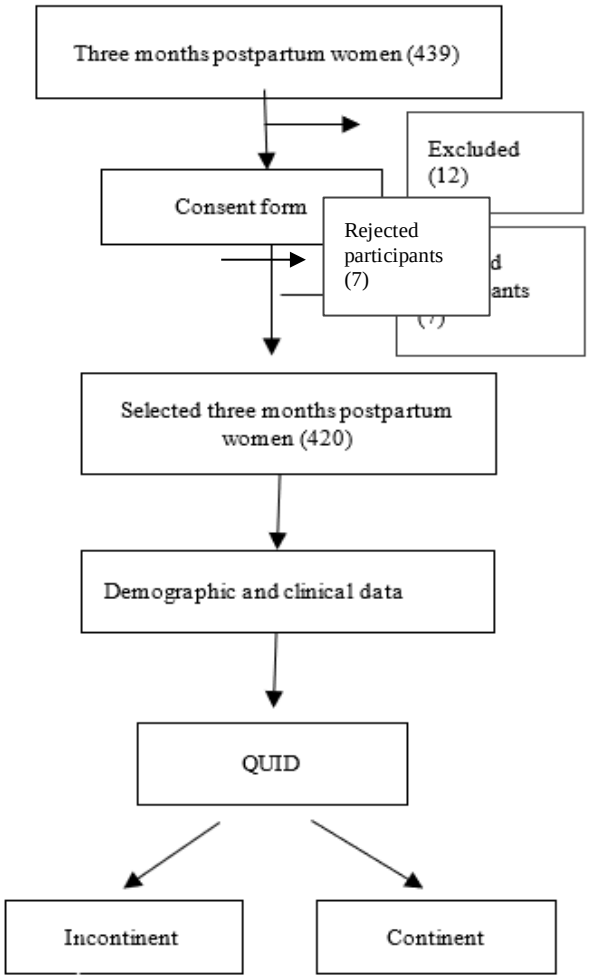

Fig: 1 : Data collection procedure

III. RESULTS

A total of 439 three months' postpartum mothers were approached during data collection but 7 mothers rejected participation and 12 mothers were excluded (3=UTI, 5=Pre pregnant UI, 4=not psychologically fit). Finally a total of 420 participants were recruited for the study.

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 post-partum mothers between ages 18 to 42 years.

ISSN No:-2456-2165

Characteristics	Mean ± SD	Maximum	Minimum
Age	28.01 ± 5.79	42	18
BMI	25.79 ± 5.00	51.3	14.8
Birth weight	2.90 ± 0.49	4.82	1.0
Head Circumference	32.78 ± 1.94	45	24

Table: 1 Descriptive details of the participants

Table 2 shows results of frequencies and percentages of risk factors in relation to the types of UI. Results suggested that most of the 3 months postpartum mothers (8.6%) who had a NVD for the first birth were diagnosed to have UUI when compared with the other types of UI. Most of the multiparous (9.9%) and primiparous (4.8%) mothers who were diagnosed to have UI were also affected by UUI. It was noted that 20% of the 3 months postpartum mothers were affected by gestational diabetes and most of these mothers were diagnosed to have SUI compared to the other types of UI whereas UUI was the most frequent among the mothers who didn't have gestational DM. 62.6% of the mothers had the episiotomy cut where 20.9% of them were diagnosed to have UI and most frequent type was identified as UUI (8.7%) , among the mothers who didn't have the cut 6.4% of mother had UUI which was the highest when compared with SUI and MUI.

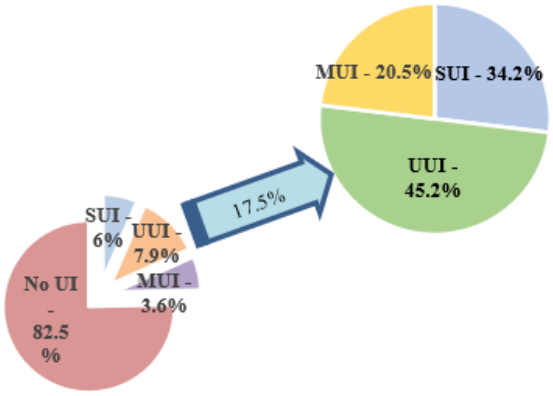

Fig 1: Prevalence of Urinary Incontinence

Table: 2 Frequencies and percentages of risk factors in relation to the types of UI

Risk factor	Types of UI							
	SUI		UUI		MUI		No UI	
	n	%	n	%	n	%	n	%
First Birth Type								
NVD	24	7.5	27	8.4	11	3.4	258	8.6
LSCS	1	1.0	6	6.1	4	4.0	88	88.9
Parity								
Primiparous	7	4.2	8	4.8	3	1.8	150	89.3
Multiparous	18	7.1	25	9.9	12	4.8	197	78.2
Gestational DM								
DM^{+}	8	9.5	6	7.1	6	7.1	64	76.2
DM^{0}	17	5.1	27	8.0	9	2.7	283	84.2
Episiotomy								
With episiotomy	20	7.6	23	8.7	12	4.6	208	79.1
No episiotomy	5	3.2	10	6.4	3	1.9	139	88.5

UUI- urge urinary incontinence, SUI- stress urinary incontinence, MUI- mixed urinary incontinence

ISSN No:-2456-2165

➢ *Prevalence of UI, SUI, UUI and No UI*

The prevalence of urinary incontinence out of all 420 postpartum mothers was 17.5%, of which 6.0% (n=25) was SUI, 7.9% (n=33) was UUI and 3.6% (n=15) was MUI. The prevalence of three types of urinary incontinence as a percentage of the diagnosed women, 34.2% of SUI, 45.2% of UUI and 20.5% of MUI (Fig: 1).

Multinomial logistic regression was performed on the current study, to model the relationship between types of urinary incontinence (SUI, UUI, MUI, and No UI) and its association with risk factors. The traditional 0.05 criterion of statistical significance was employed for all tests ($p \leq 0.05$). The dependent Variables were the types of UI and the independent variables were the risk factors.

The Model Fitted was checked with the use of Goodness of Fit, since the p value of Pearson test statistics was greater than 0.05, it was concluded that the model explains the data well at 5% level significance. Next the Multinomial logistic regression was fitted and the output is shown in Table 3.

Table 3: Likelihood ratio test

Risk factors	C hi-square x2	Df (degree of freedom)	p value
AGE	1.061	3	0.786
BMI	5.680	3	0.128
Birth Weight	3.164	3	0.367
Head Circumference	5.910	3	0.116
NVD	7.530	3	0.057
LSCS	2.680	3	0 .444
Parity	14.793	3	0 .002
First Birth Type	10.694	3	0 .014
Episiotomy	19.068	6	0 .004
Gestational DM	6.399	3	0 .094

NVD-Normal vaginal delivery
LSCS- Lower segment Cesarean section
DM- Diabetes mellitus

According to the data given in Table 4, head circumference (p= 0.016), parity (p=0.050) and the first birth type (p= 0.023) had a p value lesser than 0.05, which concluded that these risk factors had a significant association with SUI. Number of Vaginal deliveries (p=0.034) and again Parity (p=0.002) showed a significant association with UUI and finally first birth (p=0.016), episiotomy (p=0.047) and gestational DM (p=0.03) showed a significant association with MUI because their p values were lesser than 0.05.

Table: 4 Parameter Estimates of the significant risk factors relative to the type of urinary incontinence.

Type	Risk Factors	B	Sig.
SUI	Head circumference	0 .342	0.016
	Parity :		
	Primiparous	-1.189	0.050
	Multiparous	0^b	
	1st Birth :		
	LSCS	-3.034	0.023
	NVD	0^b	
UUI	Parity :		
	Primiparous	-1.790	0.002
	Multiparous	0^b	
	No of NVD	0.774	0.034
MUI	BMI	0.133	0.027
	1st Birth		
	LSCS	3.393	0.016
	NVD	0^b	
	Episiotomy :		
	Response – NO	-2.023	0.047
	Response – YES	0^b	
	Gestational DM		
	Response – NO	-1.334	0.030
	Response – YES	0^b	

IV. DISCUSSION

Urinary incontinence affecting health related quality of life is highly prevalent, marking a range from 5-70% of any type of urinary incontinence globally among female population [6]. 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 our data showed 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) [7] in Oregon, USA which was 17.1%, but lower than the study by Glazener et al (2006) [8]. which was conducted in Scotland and the meta-analysis by Tom and Rotreivet (2010) [2] which was respectively 28% and 28.7%. In comparison to the prevalence of South Asian countries, the present study showed a 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) [9] in Thailand which was 7.8%. A higher prevalence of urinary

ISSN No:-2456-2165

incontinence (20.3%) than the present study was reported in Indonesia by Fakhrizal et al (2016) [10].

The research conducted in the Teaching Hospital , Peradeniya, Sri Lanka, reported a prevalence of 4.8% for both UUI and MUI where as Stress prevalence was 1.7%. Pethiyagoda and Manchanyaka, (2018). Another study conducted using 2354 women (18-90 years) reported 10% of SUI , 29.9% of UUI 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 [11] (Hemachandra, Rajapaksa and Manderson, 2009).

- *Risk factors associated with Urinary Incontinence (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 & Moraes, (2016) also had reported similar results in their studies, while Macarthur et al (2015) and Eftekhar et al (2006) reported controversial results, showing an association between BMI and UI. A case control study by Helena & Moraes (2016), Boyles et al (2009) and Tanawattanacharoen and Thongtawee (2014) stated that there was no association between the birth weight of the new born and the prevalence of UI which supported the results of the current study (mean birth weight 2.9±0.49kg), 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 analyzed in the present study was head circumference of the new born 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 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 analyzed 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 [12] (Lin et al, 2018).

A case-control study by Helena and Moraes (2016) assessed the risk factors, and 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 [13]. 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.

There are some limitations to our study, a questionnaire was used to diagnose UI in the present study, but the gold standard test for UI diagnosis are urodynamic tests a confirmation with the use of urodynamic tests gives results that are more accurate.

Generalization of results could have been done with a larger sample size, and if the study was carried out in more areas in Sri Lanka. Details on prolonged labor, vaginal tears and expulsion of the placenta were not successfully noted because it was not clearly understood by the mothers and most of them didn't remember such details.

V. CONCLUSION

In conclusion, the present study identified the prevalence of SUI as 6.0% while the most prevalent type of UI was UUI (7.9%). The risk factors that were significant with UI were noted to be the head circumference, parity and first birth. UI seemed to be a condition that is often underreported therefore, it is recommended that appropriate

steps should be taken with the support of relevant authorities to implement awareness programs to improve knowledge about UI and physiotherapy interventions in this population.

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