Frequency of pelvic floor muscle weakness and urinary incontinence among women after vaginal delivery

Faiza Asghar[1], Huma Basharat[2],
[1]Allied Health Sciences, University of Chenab, Gujrat, Punjab, Pakistan.
[2]University Institute of Physical Therapy, University of Lahore, Punjab, Pakistan

ABSTRACT

Background: Urinary Incontinence is a common affliction that impairs quality of life and restricts social activity in adult women. Previous literature has told about prevalence of urinary incontinence in females in post-partum period including both vaginal and cesarean delivery. Objective of this study was to see the frequency of pelvic floor weakness leading to urinary incontinence after vaginal delivery.

Methods: A descriptive cross sectional study was designed on females that had vaginal delivery at Govt. Aziz Bhatti Shaheed Hospital, who were identified by Medical, Epidemiological, and Social aspects of Aging (MESA) questionnaire to reflect urinary incontinence. There was no significant difference between age, education of women. Women of age between 18 -45 were included in study. MESA questionnaire was used as data collection tool.

Results: Results indicated that 29% females of the study population had urinary incontinence after vaginal delivery and 71% of study population did not have symptoms of urinary incontinence. Urinary incontinence was more common in old age females.

Conclusion: Frequency of urinary incontinence was very high in women of reproductive age that had vaginal delivery to develop muscle weakness leading to urinary incontinence.

Keywords: Prevalence, urinary incontinence, frequency, reproductive age

INTRODUCTION

Childbirth is often considered the main etiological factor in the development of female Urinary incontinence (UI). For that reason females in the western countries have been encouraged to engage in postpartum pelvic floor muscle (PFM) exercise in order to strengthen the pelvic floor. However, the effect of postpartum PFM exercise has been sparsely documented. The aim of this article is to review and discuss literature related to prevalence of postpartum UI and effect of postpartum PFM exercise in the treatment of UI. The reported prevalence of UI postpartum varies from 0.7% to 44%. The variation may be explained by different definitions of UI used in the questionnaires and that the registration of incontinence was done at different intervals after delivery.

Some have evaluated PFM strength, others the frequency of UI. PFM strength is difficult to measure and the reliability and validity of the methods used is open to question. Another flaw in some of the previous studies is the training protocol applied to improve PFM strength. Mørkved and Bø tried to take into account the above mentioned methodological considerations, in a study aiming to evaluate the effect of postpartum PFM exercise. The results demonstrate that postpartum PFM exercise is effective in strengthening the PFM and in the treatment of UI. However, success of PFM exercise is dependent upon both the training frequency and intensity. This requires a closer follow up of the postpartum females, than the written information that usually serves this purpose at the present time.

Urinary incontinence is defined as the involuntary leakage of urine. This disorder is more common in females than in males. Urinary incontinence can considerably harm quality of life, limiting societal movements in females and typically go along with medical problems. However, (Urinary incontinence) is not fatal; it is a very

unbearable disorder. "Incontinence is a state that will not murder me, but it seized my life," is an emotional quote that appropriately elaborates the influence of (Urinary incontinence) on the patient. One woman was so disturbed by (Urinary incontinence) that she initiated the Simon Foundation for Continence and became a representative, using television and radio programs as a medium all over the world.

The Continence Foundation has testified that one out of four females and one in nine males will practice (Urinary incontinence) at certain phase in their lives. It is significant to discover all the features of (Urinary incontinence) now because life expectancy is higher, and it is assessed that as the (baby boomer generation) ages, there is going to be an increased demand for better quality of life in the senior people. (Urinary incontinence) upsets over half of nursing home residents and is one of the main causative aspects in determining if an elderly person needs to be acknowledged into a nursing home.

The problem of Urinary incontinence is high, not only in terms of cost of incontinence products and nursing home costs but also in terms of loss of quality of life and decreased productivity. A (Gallup poll) result in 1994 indicated that almost 70% of (Urinary incontinence) sufferers failed to seek medical treatment, and the majority of those who eventually sought medical help had waited at least four years before talking to their physicians about this problem. There appears to be a stigma attached to (Urinary incontinence) that causes one to suffer in silence. Those females afflicted by (Urinary incontinence) do not discuss this condition even with their partner or closest relative.Their main fear appears to be that they would be perceived as being "dirty" or "unclean."

Each year, pelvic floor (PF) dysfunction affects between 300,000 and 400,000 American females so severely that they require surgery. Clinical and epidemiological

studies have indicated that females who undergo vaginal delivery are at higher risk of subsequent incontinence than nulliparous females and females who undergo cesarean section. Furthermore, females sustain the most significant PF damage during the first vaginal delivery.

Some years ago, we initiated a clinical research study to determine the biomechanical forces on PF neuromuscular structures during delivery. The parameters from the intrarectal pressure recordings in the first study were correlated in the present study with the PF complaints in this population of primiparous females evaluated using ICS-validated questionnaires 1 year and more after delivery to assess whether they could be used to establish a critical area of pressure as a threshold for the occurrence of permanent neuromuscular lesions that may lead to further PF dysfunction. The objective of this study was to determine the frequency of pelvic floor muscle weakness that cause involuntary urination among women after vaginal delivery.

METHODOLOGY

Design, study population, setting and duration of study

This is an epidemiological cross-sectional study about postnatal urinary incontinence. The sample size calculated was based on different studies conducted in which the pervasiveness of urinary incontinence identified was on average 25% among women at postnatal. It was assumed a 5% margin of error with a probability of 95% of certainty.Data were collected from Govt. Aziz Bhatti Hospital Department of Physiotherapy Gujrat, Lahore.

Sampling Technique and Sample size calculation

Non-probability, convenient sampling technique was applied for the selection of participants. Sample size calculation was done using below maintained formula.

$$n = (Z1-\alpha/2)^2 (P)(1-P)/(d)^2$$

In formula, $Z1-\alpha/2 = 1.96$, It was standard normal variate at 5% significance level, $p = 0.5$, which was expected proportion founded on previous study, d = absolute error or precision or marginal error is 5%

$$n = 288$$

Participants

Female of aged 18 to 45 years ,women having vaginal delivery at Govt Aziz Bhatii Hospital Gujrat were included. Women having Cesarean section Active urinary tract infection, Women having anal incontinence or organ prolapsed after vaginal delivery were excluded.

Consent and ethical approval

Ethical approval was done by the institutional review board (IRB) of university of Lahore, Punjab, Pakistan. Informed consent was taken from the study participants.

Data collection Procedure:

After taking consent from patients, at "Govt. Aziz Bhatti Hospital, Gujrat". Patients came from Gynaecology department. Structured questionnaire were filled up and all the data collected through different ways. Questionnaires were filled up by two ways; firstly by giving them to be filled by themselves; secondly, by asking questions written on questionnaire and filled by myself. This is because majority of the sample selected was having difficulty to understand questions, written in English. Hence, this particular strategy was adopted to remove this hurdle from the research process and as a result of this; there is 100 per cent response rate.

The women separately interrogated in a private room, utilizing a structure with recognizable proof information, obstetric foundation and information from involuntary urination trouble.

Statistical Analysis:

The data is analyzed by using the SPSS 20.0 statistical software. Descriptive characteristics including means and standard deviations (SD) are tested. The mean differences with SD for the outcome measures in terms the MESA Urinary Incontinence Questionnaire (attached as Appendix) was the research tool used in this study. This is a simple, reliable, validated, self-administered questionnaire that includes seventeen Urinary Incontinence questions. Each question has a score ranging from 0 to 3. The questions' scores were added and an index was used to calculate the total score from question ten to question seventeen (sum of scores/24) %.

RESULTS

Following frequency tests are applied to measure prevalence of urinary incontinence after vaginal delivery.

Table: 1. Age of Respondent:

Data was collected from 288 respondents from which 204 (71%) respondents have not faced urinary incontinence; however, 84 (29%) respondents faced urinary incontinence. Majority of respondents were above 30 years of age.

Age of Respondent

	Frequency	Percent	Valid Percent	Cumulative Percent
21.00	12	4.2	4.2	4.2
24.00	12	4.2	4.2	8.3
25.00	12	4.2	4.2	12.5
26.00	12	4.2	4.2	16.7
27.00	12	4.2	4.2	20.8
28.00	12	4.2	4.2	25.0
32.00	24	8.3	8.3	33.3
34.00	12	4.2	4.2	37.5
35.00	24	8.3	8.3	45.8
36.00	12	4.2	4.2	50.0
37.00	24	8.3	8.3	58.3
38.00	12	4.2	4.2	62.5
39.00	24	8.3	8.3	70.8
41.00	24	8.3	8.3	79.2
42.00	24	8.3	8.3	87.5
43.00	24	8.3	8.3	95.8
44.00	12	4.2	4.2	100.0
Total	**288**	**100.0**	**100.0**	

Table: 2. Comparison of Engagement and Duration of Urinary Incontinence:

Women who experienced incontinence after child birth were further analysed by asking them the duration of urinary incontinence, from which 71% (out of 84) have it less than 1 year, while others have more than a year. Some of them have it for both at

night and day(14%), however, majority have either at night(43%) or at day(43%). This indicates the significance of duration with engagement of incontinence among postpartum cases.

Q2 (Urinary loss duration period)

Q1 (Experiencing Urinary loss)		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	204	100.0	100.0	100.0
Valid	months	60	71.4	71.4	71.4
	years	24	28.6	28.6	100.0
	Total	84	100.0	100.0	

Table: 3. Comparison of Urinary loss experience and Amount of Urine:

Q3 (Timings of Urinary loss)

Q1 (Experiencing Urinary loss)	Observed N	Expected N	Residual
.00	204	204.0	.0
Total	204[a]		
Total	84		
Day time	36	28.0	8.0
Night Time	36	28.0	8.0
Both	12	28.0	-16.0

Table 7.0: Comparison of Factors cause Urinary loss

		Urine loss just after bladder full		urine loss due to cold weather		urine loss due to cold beverages		urine loss due to sneezing		urine loss due to postural change		urine loss due to brisk walking		urine loss due to constipation	
		Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
No	**never**	204	70.83	204	70.83	204	70.83	204	70.83	204	70.83	204	70.83	204	70.83
Yes	**never**	0	0	0	0	12	4.17	12	4.17	12	4.17	12	4.17	0	0
	rarely	24	8.33	24	8.33	12	4.17	24	**8.33**	48	**16.67**	48	**16.67**	60	**20.83**
	sometime	24	8.33	12	4.17	24	8.33	24	**8.33**	24	8.33	0	0	12	4.17
	often	**36**	**12.50**	48	**16.67**	36	**12.50**	24	**8.33**	0	0	24	8.33	12	4.17

Descriptive Statistics for Variable that cause and measure Urinary Incontinence

Variables for UI	Minimum Value	Maximum Value	Mean	Standard Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Urinary Incontinence	0.00	1.00	.2917	.45532	.922	.144
Duration of UI	0.00	3.00	.6667	1.06904	1.110	.144
Frequency of UI	0.00	3.00	.5000	.86753	1.548	.144
How Times	0.00	3.00	.6667	1.10747	1.247	.144
Protection	0.00	2.00	.4167	.70340	1.388	.144
Napkins	0.00	2.00	.1250	.43975	3.574	.144

No. in a week						
Pads	0.00	4.00	.2083	.81685	4.234	.144
Clothes	0.00	4.00	.2500	.87950	3.574	.144
Tissues	0.00	3.00	.1250	.60052	4.611	.144
Others	0.00	0.00	0.0000	0.00000		
Amount of Urine	0.00	3.00	.4167	.76052	2.007	.144
Urine loss just after bladder full	0.00	3.00	.6250	1.07473	1.402	.144
Urine loss due to cold weather	0.00	3.00	.6667	1.14460	1.354	.144
Urine loss due to cold beverages	0.00	3.00	.5833	1.07878	1.493	.144
Urine loss due to sneezing	0.00	3.00	.5000	.95909	1.718	.144
Urine loss due to postural change	0.00	2.00	.3333	.62470	1.689	.144
Urine loss due to brisk walking	0.00	3.00	.4167	.86351	2.222	.144
Urine loss due to constipation	0.00	3.00	.4167	.76052	2.007	.144
TOTAL Respondents	288					

Table: 8. Comparison of Variables cause and Measure Urinary Incontinence through descriptive statistical measures:

Descriptive statistical measures are executed to not only find out causes but measure those causes, so that postpartum prevalence of incontinence can be concluded with statistical tools. Table 8 contains three statistical tools' results namely (i) Mean, (ii) Standard Deviation and (iii) skewness. It was found that standard deviation has higher value than mean for all types of variables. This is because of 71% responses that have no incontinence after vaginal delivery, which means data is significantly dispersed among all types of variables. Values of sample positively skewed that means there

data is inclined towards higher values. However, value of skewness is greater than standard deviation that is more than mean value

DISCUSSION

Prevalence of urinary incontinence subsequent to child birth among women is unclear and has been reported to be caused by bladder instability (Cutner A, 1992), high level of progesterone encourage a decrease in estrogen receptor (Miodrag A, 1988), correlation between bladder and enlarged uterus, decreased tensile control of fascia and bladder anchoring system (Landon CR, 1990), organic faintness of pelvic floor muscle, and burdened urethrovesical unit in overweight women (Bump RC, 1993). In general, these above factors may result postpartum urinary incontinence.

In current study data related to prevalence of urinary incontinence were collected by self-reporting structured questionnaire. Majority of respondents did face any type of incontinence after child birth (71%). However, 84 respondents faced postpartum urinary incontinence (29%). Age might be one of main reasons behind the prevalence of incontinence (*Hunskaar S,et al. 1999)*. Amount of urinary leakage might differ among these affected women because of difference in their age groups (Milsom I, 1993).

Regarding the measurement, the women's routine life experience with timings of leakage was registered but response was same for both night and day time each (36 out of 84 affected respondents). Amount of leakage is less than one and a half tea spoon of urine among majority of these women (60 out of 84), while others have mixed responses. For protection measures, these women mainly rely on pads as compared to napkin, cloth or other types of material.

Throughout their lives, the participants may experience a variety of circumstances that cause urinary leakage even more consistently.

In addition, some have stated incontinence triggered by urge, even if the purpose of the indicative interrogations in the structured interview was to count prevalence of incontinence.

The factors asked in this study were not self-estimated as there is a strong link between frequency and situations in which women are being involved (Abrams P, 1988).

Urgency is one of key factor behind involuntary urine leakage and is a part of a symptom complex recognized as overactive bladder syndrome, which is defined as

urinary urgency, usually accompanied by frequency and nocturia, with or without urgency urinary incontinence, in the absence of urinary tract infection or other obvious disease (*Haylen BT, et al. 2010).*On the other hand, joint report by the 2010 International Continence Society (ICS) / Urogynecological Association (IUGA), urinary incontinence caused by stress is urine leakage on work, physical exertion, or on sneezing or coughing *(Haylen BT, et al. 2010)*. However, the results showed that 42% of effected participants face incontinence because of bladder fullness that creates pressure on pelvic floor muscle, this show weather conditions and postural changes are also play major role in urine leakage, especially among women (Khandelwal, C, 2013). Moreover, this study also 57% of affected women often face incontinence due to cold weather conditions, while postural change and cold beverages have less effect on them comparatively.

CONCLUSIONS:

It was concluded from analysis of results that there were very high chances of pelvic floor weakness in women having vaginal delivery to suffer which leads to urinary incontinence.

RECOMMENDATIONS:

Further studies are also required to measure the frequency of urinary incontinence in nulliparous and primiparous women separately. Studies need to be designed to explore the associations between the various risk factors for urinary incontinence.

REFERENCES

CHRISTINE KHANDELWAL, DO, and CHRISTINE KISTLER, MD, MASc, University of North Carolina, Chapel Hill, North Carolina Am Fam Physician. 2013 Apr 15;87(8):543-550.

CHALIHA, C., SULTAN, A. H., BLAND, J. M., MONGA, A. K. & STANTON, S. L. 2001. Anal function: effect of pregnancy and delivery. *Am J Obstet Gynecol,* 185**,** 427-32.

CHIN, H. Y., CHEN, M. C., LIU, Y. H. & WANG, K. H. 2006. Postpartum urinary incontinence: a comparison of vaginal delivery, elective, and emergent cesarean section. *Int Urogynecol J Pelvic Floor Dysfunct,* 17**,** 631-5.

DONNELLY, V., FYNES, M., CAMPBELL, D., JOHNSON, H., O'CONNELL, P. R. & O'HERLIHY, C. 1998. Obstetric Events Leading to Anal Sphincter Damage. *Obstetrics & Gynecology,* 92**,** 955-961.

FRITEL, X., SCHAAL, J. P., FAUCONNIER, A., BERTRAND, V., LEVET, C. & PIGNE, A. 2008. Pelvic floor disorders 4 years after first delivery: a comparative study of restrictive versus systematic episiotomy. *BJOG,* 115**,** 247-52.

MEYER, S., SALCHLI, F., HOHLFELD, P., BAUD, D., VIAL, Y. & ACHTARI, C. 2016. Continuous recording of intrarectal pressures during the second phase of labour: correlations with postpartum pelvic floor complaints. A biomechanical-clinical study. *Int Urogynecol J*.

MORKVED, S. & BO, K. 2014. Effect of pelvic floor muscle training during pregnancy and after childbirth on prevention and treatment of urinary incontinence: a systematic review. *Br J Sports Med,* 48**,** 299-310.

NG, K., CHEUNG, R. Y., LEE, L. L., CHUNG, T. K. & CHAN, S. S. 2017. An observational follow-up study on pelvic floor disorders to 3-5 years after delivery. *Int Urogynecol J*.

S. MARTINS, E., BEZERRA PINHEIRO, A. K., SOUZA AQUINO, P. D., B. ORIÁ, M. O., B. CASTRO, R. C. M., M. LIMA, D. J., ANDRADE, K. V., P. DE SOUSA, C. S. & HOLANDA, S. M. 2016. Urinary Incontinence in Pregnant Women: Integrative Review. *Open Journal of Nursing*, 06**,** 229-238.

SCHIMPF, M. O. 2016. Postpartum urinary incontinence: asking the right questions. *BJOG,* 123**,** 1229.

THOM, D. H. & RORTVEIT, G. 2010. Prevalence of postpartum urinary incontinence: a systematic review. *Acta Obstet Gynecol Scand,* 89**,** 1511-22.

VOLLOYHAUG, I., VAN GRUTING, I., VAN DELFT, K., SULTAN, A. H. & THAKAR, R. 2016. Is bladder neck and urethral mobility associated with urinary incontinence and mode of delivery 4 years after childbirth? *Neurourol Urodyn*.

WANG, H. & GHONIEM, G. 2017. Postpartum stress urinary incontinence, is it related to vaginal delivery? *J Matern Fetal Neonatal Med***,** 1-4.

WOOD, L. N. & ANGER, J. T. 2014. Urinary incontinence in women. *BMJ,* 349**,** g4531.

AUTHORS

First Author: Faiza Asghar, MS, Lecturer, Department of Rehabilitation Sciences, University of Chenab, Gujrat. Punjab, Pakistan.

Second Author: Huma Basharat, DPT, University Institute of Physical Therapy, University of Lahore, Punjab, Pakistan.

***Corresponding Authors:** Faiza Asghar,