

Relation between Perineal Length and Anal Incontinence in Multiparous Women

Dr Vikas Shukla¹, Dr M Ketkar², Dr Nikhilkumar Bijjaragi³

¹Junior Resident, Department of General Surgery, BHRC, Pune, MS, India

²Professor, Department of General Surgery, BHRC, Pune, MS, India

³Junior Resident, Department of General Surgery, BHRC, Pune, MS, India

Abstract: *Fecal incontinence (FI) affects activities of daily life and has been recognized as a distressing disorder. The prevalence of FI in the adult population ranges from 2 to 24%, depending upon the definition of FI used. There is no consensus on methods of classifying the symptoms and causes of FI. Classification by symptom is commonly used, for example, involuntary but recognized passage of flatus, liquid or solid stool or unrecognized anal leakage. Delivery is considered the most important risk factor for FI in adult women with reported prevalence rates of 10–27% for incontinence of feces and 18–25% for flatus, at six weeks postpartum. At six months postpartum, the prevalence rates are 8–17% and 18–27%, respectively, depending on mode of delivery and perineal injury. The functional role of the perineal length has been neglected in clinical practice. Perineal length is “distance from the posterior fourchette to the centre of the anal orifice”. A short perineal length (<3cm) was described as being associated with weakness of the anatomical support of the pelvic viscera. However it is also known that there are considerable genetic and ethnic variations in the morphology of the pelvic floor of women. The purpose of this study was to assess the relationship between perineal length measurements and anal incontinence in multiparous women. **Conclusion:** In present study, we observed that anal incontinence is very common among multiparous females who delivered vaginally especially in cases with instrumental delivery and those who had a history of obstructed labour. A significant inverse correlation was observed between perineal length and anal incontinence, meaning that in cases with short perineum i.e. less than 2.5 cm are more likely to develop anal incontinence. This could be due to the fact that short perineal length is observed to be associated with weakness of the anatomical support of the pelvic viscera and hence development of anal incontinence or could also be related to its association with anal sphincter injury during child birth.*

1. Introduction

Involuntary loss of flatus, liquid, or solid stool that can cause social or hygienic problem to a person is known as Anal incontinence. Anal incontinence has been variously defined and there are no internationally accepted definitions for it [1].

Its Causes has been defined differently in different literature as caused by trauma or congenital defect or neurological disease. Neurological incontinence is mainly due to injury to pudendal nerve at the time of normal vaginal delivery, or by obstructed labour or instrumental delivery [16-19]. Patient become symptomatic later in life.

Anal incontinence maybe due to sensory or motor damage to the perineal area after vaginal delivery. Some degree of trauma to the perineum always occur in normal vaginal delivery, as now incidence of episiotomy and instrumental delivery is increasing chances of perineal trauma also increasing these days. This results in decrease in the perineal length and which in turn can be related with anal incontinence. [2-9]

Perineal length is “distance from the posterior fourchette to the centre of the anal orifice” [15] Perineal trauma can be associated with significant long-term morbidity. While a number of studies have looked at perineal length with regards to risk of perineal trauma none have produced data for perineal length in relation to degree of incontinence caused in later life in multiparous women's.

Hence shortening of perineal length in multiparous leads to anal incontinence in of various degree. So studying this particular topic it will be helpful in finding out the relation between the two and further discussion could be done on it. [14, 19-21]

Aim: The aim is to establish relation of perineal length with severity of anal incontinence in Multiparous women.

Objectives:

- 1) To assess perineal length in multiparous women.
- 2) To evaluate degree of incontinence in above mentioned group
- 3) To find out anal sphincter tone in all women's.
- 4) To correlate with above two findings and establishing relationship between them.

2. Materials and Methods

Study Area: Bharati hospital and research center

Study Population: 100 multiparous women presenting to Gynec OPD (age>35)

Study Design: Prospective observational study

Period of Study: 24 months

Inclusion Criteria: Multiparous women with age above 35 years with normal or instrumental Delivery.

Exclusion Criteria: Nulliparous, Caesarian section.

3. Methodology

- 100 patients of age above 35 years and fulfilling the inclusion criteria will be taken up for study.
- Patients will be interviewed and demographic data such as age and sex will be noted. Patient will be provided a set of questioner and response of
- patients will be recorded for the same.
- Patient will be subjected to thorough general examination and perineal length measurement by using calliper.
- Per Rectal Examination will be done after that and grading of Anal tone done according to DRESS Scoring.
- Then anal tone will be measured by using Anal tonometer.

For the purpose of analysis and quantification of the data thus extracted, the study population is divided into 2 groups; age groups between 35 years and 50 years and above 50 years of age

Sample size: 100 women Maximum age: 68 years Minimum age: 35 years Mean Age: 51.5 years

4. Results

Table 1: Distribution of study cases as per prevalence of anal incontinence in multiparous women

Anal Incontinence	N	%
No	91	91.0%
Yes	9	9.0%
Total	100	100%

In present study, prevalence of anal incontinence in multiparous women was observed as 9%.

Table 2: Distribution of study cases as per severity of anal incontinence

Anal Incontinence Severity	N	%
No	91	91.0%
Flatus Incontinence	7	7.0%
Liquid/ Solid Incontinence	2	2.0%
Total	100	100.0%

Out of the 9% cases with anal incontinence, severe incontinence i.e. incontinence to fluids/ solids was seen in 2% cases.

No association was observed between age and presence of anal incontinence among multi-parous women (p-0.73).

Among the intra-partum factors, history of instrumental delivery and prolonged/ obstructed labour was observed to be significantly associated with development of anal incontinence (p<0.01).

Perineal length of less than 2.5 cm was significantly observed to be associated with development of anal incontinence (p<0.01). At this cut-off, sensitivity and specificity were 100% and 80.2% respectively.

A significant inverse correlation was observed between perineal length and severity of anal incontinence (r-0.588; p<0.01).

In all the cases of anal incontinence, there was either no resting anal tone or very low anal tone as per digital rectal examination scoring system (DRESS). Prevalence of anal incontinence in cases with no anal tone was 71.4% as compared to 19% and 0% in cases with very low and normal/ high anal tone.

In all the cases of anal incontinence, there was either no increase in anal tone or only slight increase in anal tone during squeezing as per digital rectal examination scoring system (DRESS). Mean resting (22.33 vs 47.28 units) and squeezing anal tone (32.33 vs 88.62 units) as measured by anal tonometer was significantly lower in cases with anal incontinence (p<0.01).

5. Discussion

Present hospital study aimed at finding the prevalence of anal incontinence (AI) in multi-parous women and establishing the relation of perineal length with severity of anal incontinence. A total of 100 consecutive multi-parous females coming to our hospital and giving informed consent were selected for the study. Patients were then subjected to thorough general examination and perineal length measurement by using standard calliper. Per Rectal Examination was done after that and grading of anal tone done according to the Digital Rectal Exam Scoring System (DRESS). Anal tone was then measured by using anal tonometer.

Prevalence of anal incontinence

Prevalence of anal incontinence in multiparous women was observed as 9% in present study. Out of the 9% cases with anal incontinence, severe incontinence i.e. incontinence to fluids/ solids was seen in 2% cases.

The prevalence of anal incontinence following vaginal delivery is between 5 and 26% [84, 85]. Rommen et al. [86] in their study among Norwegian females aimed to establish the prevalence of AI. Among the 20 391 women, AI was reported by 19.1% and fecal incontinence was reported by 3.0%. Berg et al. [87] studied on the prevalence of incontinence following vaginal delivery in similar population, which showed 11.7% having urgency of faeces whereas involuntary leakage of flatus was seen in 8.7% cases. Johannessen HH et al. [88] in his study predicted the prevalence of incontinence in late pregnancy and after 1 year post partum. In his study he found that around 24% females had one and 4.7% had three or more AI symptoms in llate postpartum. After 1 year this decreased to 19% and 2.2%,. In the 2008 Kaiser Permanente Continence Associated Risk Epidemiology Study (KP CARES), a cross- sectional survey of over 4000 women aged 25 to 84, the rate of AI was 19 percent in nulliparous women and 28 percent in those with a prior vaginal delivery, amounting to an almost twofold risk of AI in those women with a prior vaginal birth [13].

Anal Incontinence and obstetric factors

Among the intra-partum factors, history of instrumental delivery and prolonged/ obstructed labour was observed to be significantly associated with development of anal incontinence ($p < 0.01$). However no association was observed with history of episiotomy.

Childbirth itself may lead to incontinence through two major mechanisms: nerve (pudendal neuropathy) and muscle injury (obstetric anal sphincter injury [OASIS]). The obstetric risk factors for both pudendal neuropathy and OASIS are similar and include midline episiotomy, operative delivery, particularly with forceps and larger birth weight [49]. Most studies do suggest that operative vaginal delivery (via forceps or vacuum) does increase the risk of FI or AI, especially if there is concurrent OASIS [60]. A 2008 systematic review of 18 studies concluded that vaginal delivery was associated with an increased risk of FI when compared with cesarean delivery, with the highest risk being in those undergoing forceps or other instrumented delivery [61]. In the MOAD study of women recruited 5 to 10 years from first birth, the AI risk was greater for women with operative compared with spontaneous vaginal delivery (15 versus 11 percent) [57]. The above Swedish population-based study that included 3.7 million individuals reported a 70 percent increased odds of AI for women undergoing instrumented delivery compared with spontaneous vaginal delivery [60].

Bols EM et al. [89] conducted a systemic review including studies from 1980 up to 2009. They observed a significant association between prolonged duration of labour and development of anal incontinence in females. Lane TL et al. [8] in their study observed that duration of second stage of labor is a significant ($P < 0.04$) predictor of third- and fourth-degree lacerations, with odds ratios of 32 (1.3 to 807 as 95% CI). The inference was if second stage of labor was more than 99 minutes than it causes third- and fourth-degree lacerations extending into the anal sphincter and thus responsible of anal incontinence in these cases.

Anal Incontinence and Perineal length

Perineal length of less than 2.5 cm was significantly observed to be associated with development of anal incontinence ($p < 0.01$). At this cut-off, sensitivity and specificity were 100% and 80.2% respectively. A significant inverse correlation was observed between perineal length and severity of anal incontinence ($r = -0.588$; $p < 0.01$).

Perineal length is "distance from the posterior fourchette to the centre of the anal orifice". The length of the perineum, was first cited in the literature as a cause of traumatic vaginal delivery by Nichols and Randall in (1989) [76]]. Rizk & Thomas [77] observed that women with a short perineum (< 4 cm) had significantly higher rates of perineal tears and instrumented delivery. The same finding was supported by two other observational studies [78, 79]. Deering SH et al. [78] also observed that 3rd and 4th degree laceration (40% vs. 5.6%, $P = 0.004$) was seen in females with a perineal body of ≤ 2.5 cm. He observed that if perineal body ≤ 3.5 cm then chances of operative vaginal delivery was greater (28.5% vs. 9.2%, $P = .006$). Lane TL et al. [82] assessed the relation between perineal body length and the

risk of perineal laceration extending into the anal sphincter during vaginal delivery in primigravid patients. Using logistic regression, length of the perineal body was observed as a significant predictor of third- and fourth-degree lacerations, with odds ratios of 24 (1.3 to 456). Study reveals that 3rd and 4th degree laceration was more common if perineal body length of ≤ 3.5 cm.

To the best of our knowledge, none of the studies till date has evaluated the correlation between perineal length and anal incontinence and evaluated a relationship between perineal length with severity of anal incontinence. But our results showed that cases with short perineum (< 2.5 cm) are more likely to develop anal incontinence. This could be due to the fact that short perineal length is observed to be associated with weakness of the anatomical support of the pelvic viscera and hence development of anal incontinence and could also be related to its association with increased risk of perineal lacerations extending into the anal sphincter.

Anal Incontinence and anal tone

In all the cases of anal incontinence, there was either no resting anal tone or very low anal tone as per digital rectal examination scoring system (DRESS). Prevalence of anal incontinence in cases with no anal tone was 71.4% as compared to 19% and 0% in cases with very low and normal/ high anal tone. In all the cases of anal incontinence, there was either no increase in anal tone or only slight increase in anal tone during squeezing as per digital rectal examination scoring system (DRESS). Mean resting (22.33 vs 47.28 units) and squeezing anal tone (32.33 vs 88.62 units) as measured by anorectal manometry was significantly lower in cases with anal incontinence ($p < 0.01$).

Digital rectal examination (DRE) is routinely performed in clinical practice, among other reasons to assess anal sphincter tone, especially in fecal incontinent patients [91]. Dobben et al. found that anal tone at DRE was correlated to resting and squeeze pressures, and that its positive predictive value was higher in more extensive external anal sphincter (EAS) lesions [92]. Orkin B et al. [93] developed a novel scoring system for anal sphincter tone using a scale of 0 to 5 for both resting pressure and squeeze pressure. The DRESS score correlated very well with manometry pressures for resting pressure and squeeze pressure and is a useful description of anal sphincter resting pressure and squeeze pressure in the clinical setting.

In a patient of incontinence the most basic test for initial study is Anorectal manometry [93]. Physical examination findings and anorectal manometry if applied together will provide an objective value of squeeze and resting anal pressure. These measurements can be used for comparison after treatment. It is well established that the internal anal sphincter is tonically contracted and generates 80% of the anal resting pressure, and the external anal sphincter is striated muscle under voluntary control [94, 95]. Therefore, in the presence of a known anal sphincter defect, a normal resting tone with decreased squeeze pressure may indicate an isolated external sphincter injury; decreased resting pressure and normal squeeze pressure would suggest an isolated internal sphincter injury.

In present study too, we observed that both DRESS score and manometry findings correlates well with each other and sphincter tone and manometry pressure at rest and squeeze, were significantly lower in cases with anal incontinence.

Further studies like MRI and endorectal USG is required to establish a conclusive relation between perineal length and anal incontinence. Though this study is novel and all the values and results derived are standardized, there are flaws including a need for better and more accurate method to collect and record data and standardization. Further research is required for conclusive results.

6. Conclusion

In present study, we observed that anal incontinence is very common among multi-parous females who delivered vaginally especially in cases with instrumental delivery and those who had a history of obstructed labour. A significant inverse correlation was observed between perineal length and anal incontinence, meaning that in cases with short perineum i.e. less than 2.5 cm are more likely to develop anal incontinence. This could due to the fact that short perineal length is observed to be associated with weakness of the anatomical support of the pelvic viscera and hence development of anal incontinence or could also be related to its association with anal sphincter injury during child birth.

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