

ORIGINAL ARTICLE

Frequency of Perineal Trauma in Women Undergoing Spontaneous vs Directed Valsalva Type Pushing in LabourFATIMA AYUB¹, NILOFAR MUSTAFA², PAKEEZA ASLAM³, REHANA KANWAL⁴, QURUTULAIN MUSHTAQ⁵, SHAZIA TUFAIL⁶¹MBBS.FCPS.Registrar CMH Lahore Medical College. National University of Medical Sciences NUMS²MBBS.FCPS.MHPE. Professor CMH Lahore Medical College. National University of Medical Sciences NUMS³MBBS.FCPS.CMT. Associate Professor CMH Lahore Medical College. National University of Medical Sciences NUMS⁴MBBS.FCPS.ICMT. Associate Professor CMH Lahore Medical College NUMS⁵MBBS.FCPS.CMT. Associate Professor CMH Lahore Medical College. National University of Medical Sciences NUMS⁶MBBS.FCPS.MHPE. Associate Professor CMH Lahore Medical College NUMSCorresponding author: Pakeeza Aslam, Email: pakiza.shahid@yahoo.com**ABSTRACT****Objective:** To compare the frequency of perineal trauma in women undergoing the spontaneous vs the Valsalva-type pushing in the second stage of labour.**Study Design:** Randomized controlled trial**Duration of Study with Dates:** The study was carried out from 15-12-2020 to 19-03-2021.**Setting:** Department of Obstetrics and Gynaecology, Combined Military Hospital, Lahore. National University of Medical Sciences NUMS.**Material and Methods:** A total of 154 labouring females were enrolled in the study. These females were randomly assigned to one of two groups, A (the Valsalva-type pushing method group) and B (the spontaneous pushing group). After the delivery of the placenta, the patients were all examined for any perineal trauma as per the operational definition.**Results:** Patients ranged between 18-40 years of age with a mean age of 26.3±4.0 years in Group A and 27.0±3.3 years in Group B. All the patients were between 38-40 weeks of gestation at the time of enrollment with mean gestational age being 39±0.7 weeks for group A and 38.9±0.7 for group B. There were 61 primigravida (39.6%, 34 in Group A and 27 in Group B) and 93 multigravida (60.4%, 43 in Group A and 50 in Group B).

All women delivered vaginally in the cephalic presentation. The mean length of the second stage of labor was 25.7±29.0 min for the Valsalva pushing group and 31.6±37.5 min for the spontaneous pushing group. The mean fetal weight was 3.1±0.3 kg for both groups. 43 (55.8%) patients in the Valsalva pushing group and 46 (59.7%) in the spontaneous pushing group underwent an episiotomy during delivery.

9 (11.7%) patients in each group sustained perineal trauma ($\chi^2 = 0.0$, $p = 1.0$). No one in the sample suffered greater than a second degree laceration. Out of the nine patients that did incur perineal trauma in the Valsalva type pushing group, 4 (44.4%) were first degree perineal tears and 5 (55.6%) were second degree perineal tears while among those in the spontaneous pushing group, 2 (22.3%) fell in the first degree tear category and 7 (77.7%) in the second degree tear category ($\chi^2 = 1.0$, $p = 0.317$).**Conclusion:** Our findings suggest that there is no association between the rate of perineal trauma among patients who underwent the directed Valsalva-type method of pushing and those that employed the spontaneous pushing method during the second stage of labour.**Keywords:** Perineal trauma, Perineal tears, Second stage of labour, Pushing methods in labour, Valsalva-type pushing, Directed pushing, Spontaneous pushing**INTRODUCTION**

Perineal damage from vaginal delivery is unavoidable. There are frequently no long-term effects if the trauma is localised and does not affect the muscles of the anal sphincter. However, a breach of the anal sphincter raises the possibility of pelvic organ prolapse and faecal incontinence as later sequelae.[1]

Perineal injuries are rather common. The American College of Obstetricians and Gynecologists estimates that 53% to 79% of women may develop some degree of laceration after vaginal delivery, most usually in the perineal area, with 60-70% requiring suturing. [1] [2] The majority of these wounds will be first- and second-degree lacerations. Third- and fourth-degree lacerations, which harm the obstetric anal sphincter, might nevertheless happen in 0.6-11% of instances (OASIS). [3-6]

Women who experience perineal trauma may experience long-term physical and psychological repercussions. [7] The short-term complications include pain, infection and the potential for hemorrhage.[8] Dyspareunia, incontinence (of urine, flatus and feces) and pelvic organ prolapse constitute the long-term sequelae.[8][9] In fact, perineal pain may also extend beyond the immediate postpartum period. A study found that for 7-10% of women, perineal pain continues for as long as 3-18 months after delivery. [10]

Moreover, severe perineal trauma increases the risk of retained sponges or needles and wound breakdown or infection. Untreated or poorly healed lacerations may proceed to form perineal-rectal or rectal-vaginal fistulas. [3]

By virtue of its complications, perineal trauma greatly upsets a woman's breastfeeding routine, family life and sexual relations. Consequently, it disrupts her physical, psychological and social wellbeing. [8] It is, therefore, imperative that all possible measures be taken for perineal trauma to be avoided.

Most maternal and fetal risk factors of perineal trauma are, unfortunately, non-modifiable. These include prior C-sections or OASIS, large birth weights for the foetus, protracted second stages of labour, nulliparity, and abnormalities in the foetal presentation. Despite the fact that most of them are linked to the woman's or the direct care provider's intrapartum procedures, there are a few controllable risk factors. These include, for instance, giving birth while lithotomized or in a deep squatting position, using an epidural, an instrument, oxytocin, or a midline episiotomy. [3] [11]

One variable under women's control that has contributed to variable results in studies is what they do during the second stage of labour. If left to their own devices, the majority of women would naturally bear down a few times per contraction. In contrast, the technique that is presently routinely employed advises women to push as hard and as long as they can during the second stage of a contraction after taking a deep breath and holding it (also known as Valsalva-type pushing). [12] [13]

It is assumed that the initial purpose of focused Valsalva pushing was to shorten the second stage of labour and, in turn, lessen the perceived hazards of a protracted labour to the foetus. [13] However, research has found that there is no difference between spontaneous and guided pushing when it comes to

primary neonatal outcomes including Apgar scores, umbilical cord pH, and the number of admissions to neonatal intensive care. [12] [13] However, prolonged directed Valsalva pushing increased the danger of maternal fatigue, which increased the likelihood of an instrumental delivery. [13]

According to the Cochrane database of systematic reviews 2017, there was no difference in the incidence of perineal trauma between the two groups. However, only one study (conducted in 2005 and plagued by attrition bias) was taken into account, leading to the results to be classified as 'low-quality evidence'. [12] A more recent Taiwanese study conducted in 2017 concurs with these findings. [14] On the contrary, a study conducted on primigravida women in Michigan in 2012 deduced that the spontaneous pushing method was more likely to result in an intact perineum, and less likely to lead to an episiotomy. [15]

This study was designed to determine the frequency of perineal trauma in women who use spontaneous pushing vs those who employ the directed Valsalva-type method during the second stage of labor. Since no study of its kind has been conducted in Pakistan, we aimed to generate baseline data and help our health care professionals work towards adopting the practice better suited for our local population.

MATERIAL AND METHODS

A total of 154 cases were selected by Non-probability consecutive sampling technique with 77 each being allocated to both groups. The participants of both groups were exclusive of each other. This sample size was estimated using an expected rate of 2nd degree tear with episiotomy in spontaneous and Valsalva groups as 60% and 40% respectively. [14] The sample size was calculated using a confidence level of 95% and power of 80%. All Pregnant women with age 18-49 years of any parity, gestational age of 38 to 40 weeks at the onset of labour and delivery, Undergoing trial for vaginal delivery, Fetal cephalic presentation on ultrasound Single, healthy fetus as assessed by ultrasound findings and CTG, Second stage of labour (10 cm cervical dilation), Estimated fetal weight range of 2500 g to 4000 g as assessed by ultrasound parameters were included in this study. Patients with any known medical or obstetric condition in which the Valsalva is not recommended or is contraindicated (for example, cardiac disease), Instrumental delivery, Patients who have been administered epidural analgesics (during current labour) were excluded from study.

A total of 154 females fulfilling inclusion criteria were included in this study after permission from ethical committee and research department. Patients were booked through the Labor Rooms or the Emergency Reception Centre of the Obstetric and Gynecology Department, CMH Lahore. National University of Medical Sciences NUMS These females were randomly assigned to one of two groups, A (the Valsalva-type pushing method group) and B (the spontaneous pushing group).

When admitted, most of these patients were in the first stage of labor. Their basic demographic information such as name, age, along with parity and gestational age was noted down and they were monitored as per protocol in the labor rooms for the rest of their labor duration. Only the females who underwent a normal vaginal delivery were eventually considered part of the study. Any patient who ended up in a Cesarean section (keeping in mind the requirement of vaginal delivery for the study) or instrumental delivery (to avoid any associated confounding and considering the inability to effectively apply the two pushing methods being studied) were struck off.

Among the patients who underwent a vaginal delivery and did end up in the study, the ones in group A were directed to employ the Valsalva-type pushing method while those in group B were asked to follow the spontaneous pushing method during the second stage of labor. After the delivery of the placenta, the patients were all examined for any perineal trauma as per the operational definition. All tears / lacerations were treated as per

standard protocol. The data collected was entered on pre-designed proformas by the researcher

All the data was entered and analyzed using SPSS version 22. Descriptive statistics such as mean and standard deviation were used for quantitative data like age, gestational age (weeks), length of second stage of labor and fetal weight. Frequency and percentages were used, for categorical data like the parity, presence of episiotomy and presence of perineal tears (with degree of tears). Data were stratified for maternal age, parity, length of second stage, fetal weight, gestational age and presence of episiotomy at the time of final enrollment. The comparison of the outcome variables was carried out in both the groups via the chi-square test, taking a probability of <0.05 as significant.

RESULTS

Patients ranged between 18-40 years of age with a mean age of 26.3±4.0 years in Group A and 27.0±3.3 years in Group B. Among 77 patients in Group A, 19 (24.7%) were at 38 weeks gestational age 32 (41.5%) at 39 weeks and 26(33.7) at 40 weeks and in Group B, 25 (32.5) at 38 weeks, 31(40.2%) at 39 weeks and 21 (27.3%) at 40 weeks with mean gestational age being 39±0.7 weeks for group A and 38.9±0.7 for group B. There were 34 (44.2%) primigravida in Group A and 27 (35%) in Group B and 43 (55.8%) multigravida in Group A and 50 (65%) in Group B.

Table-1: Stratification for age with regard to Perineal trauma/tears

| Age (Year) | Group | Perineal Trauma/Tears | | Total | P value |
|------------|---------|------------------------|------------------------|-------|---------|
| | | 1 st degree | 2 nd degree | | |
| 18-30 | Group-A | 3 | 5 | 8 | 0.590 |
| | Group-B | 2 | 6 | 8 | |
| Total | | 5 | 11 | 16 | |
| 31-40 | Group-A | 1 | 0 | 1 | 0.157 |
| | Group-B | 0 | 1 | 1 | |
| Total | | 1 | 1 | 2 | |

Table-2: Stratification for parity with regard to Perineal trauma/tears

| Parity | Group | Perineal Trauma/Tears | | Total | P value |
|--------------|---------|------------------------|------------------------|-------|---------|
| | | 1 st degree | 2 nd degree | | |
| Primigravida | Group-A | 0 | 2 | 2 | 0.537 |
| | Group-B | 1 | 5 | 6 | |
| Total | | 1 | 7 | 8 | |
| Multigravida | Group-A | 4 | 3 | 7 | 0.490 |
| | Group-B | 1 | 2 | 3 | |
| Total | | 5 | 5 | 10 | |

Table 3: Stratification for gestational age with regard to Perineal trauma/tears

| Gestational age | Group | Perineal Trauma/Tears | | Total | P value |
|-----------------|---------|------------------------|------------------------|-------|---------|
| | | 1 st degree | 2 nd degree | | |
| 38 | Group-A | 1 | - | 1 | - |
| | Group-B | - | - | - | |
| Total | | 1 | - | 1 | |
| 39 | Group-A | 2 | 2 | 4 | 0.659 |
| | Group-B | 1 | 2 | 3 | |
| Total | | 3 | 4 | 7 | |
| 40 | Group-A | 1 | 3 | 4 | 0.747 |
| | Group-B | 1 | 5 | 6 | |
| Total | | 2 | 8 | 10 | |

Table-4: Stratification for length of 2nd stage of labour with regard to Perineal trauma/tears

| Length of 2 nd stage of labour | Group | Perineal Trauma/Tears | | Total | P value |
|---|---------|------------------------|------------------------|-------|---------|
| | | 1 st degree | 2 nd degree | | |
| ≤ 30 min | Group-A | 4 | 4 | 8 | 0.621 |
| | Group-B | 1 | 2 | 3 | |
| Total | | 5 | 6 | 11 | |
| > 30 min | Group-A | 0 | 1 | 1 | 0.659 |
| | Group-B | 1 | 5 | 6 | |
| Total | | 1 | 6 | 7 | |

All women delivered vaginally in the cephalic presentation. The length of the second stage of labor in Group A in 49(63.6%)

patients is < 30 minutes and > 30 minutes in 28 (36.4%) patients and in Group B 50(65%) patients is < 30 minutes and > 30 minutes in 27(35%) patients with mean 25.7±29.0 min for the Valsalva pushing group and 31.6±37.5 min for the spontaneous pushing group. The mean fetal weight was 3.1±0.3 kg for both groups. 43 (55.8%) patients in the Valsalva pushing group and 46 (59.7%) in the spontaneous pushing group underwent an episiotomy during delivery. 9 (11.7%) patients in each group sustained perineal trauma ($\chi^2 = 0.0, p = 1.0$). No one in the sample suffered greater than a second degree laceration. Out of the nine patients that did incur perineal trauma in the Valsalva type pushing group, 4 (44.4%) were first degree perineal tears and 5 (55.6%) were second degree perineal tears while among those in the spontaneous pushing group, 2 (22.3%) fell in the first degree tear category and 7 (77.7%) in the second degree tear category ($\chi^2 = 1.0, p = 0.317$). Stratification for age, parity, gestational age at the time of enrolment, the length of the second stage of labor and the performance of an episiotomy in current labor were carried out in table 1,2,3,4 and 5 respectively. No statistically significant difference was detected in perineal trauma between the valsalva pushing group and spontaneous pushing group.

Table 5: Stratification for episiotomy performed with regard to Perineal trauma/tears

| Episiotomy performed | Group | Perineal Trauma/Tears | | Total | P value |
|----------------------|---------|------------------------|------------------------|-------|---------|
| | | 1 st degree | 2 nd degree | | |
| Yes | Group-A | 0 | 2 | 2 | 0.537 |
| | Group-B | 1 | 5 | 6 | |
| Total | | 1 | 7 | 8 | |
| No | Group-A | 4 | 3 | 7 | |
| | Group-B | 1 | 3 | 4 | |
| Total | | 5 | 5 | 10 | |

DISCUSSION

The present study suggests that there is no association between the pushing method employed and the occurrence of perineal trauma (all grades combined) during delivery. This finding is in concurrence with three randomized controlled trials that found no statistically significant difference in perineal trauma or episiotomy rate between the spontaneous vs directed Valsalva-type pushing groups. [16] [17] [18] A quality-assessed systematic review in 2000 also found that there was no difference between pushing methods with regard to perineal trauma [19] Later, in 2011, a meta analysis by Prins et al. came to the same conclusion. [20]

Third- or fourth-degree laceration was not significantly different between the spontaneous pushing and directed pushing groups: this result was the same as that found by Lemos et al[25]. A study in 2022 concludes There was no significant difference in perineal laceration, third- or fourth-degree laceration, or episiotomy between the spontaneous pushing and directed pushing groups.[26]

This is a quasi-randomised clinical trial, with 62 low-risk pregnant women in the second stage of labour. They were randomly allocated in control (CG) (n=31) and intervention (IG) (n=31) groups. The IG performed spontaneous pushing with pursed lips breathing while the CG was oriented to perform directed pushing associated with Valsalva Manoeuvre (VM). There was no difference between the groups regarding the occurrence of episiotomy [27-30]

A study by Yeates and Roberts back in 1984 stated that directed pushing results in a decreased risk of perineal trauma. [21] Fast forward to 2006, Schaffer et al. came to the same conclusion. [22] One of the explanations for this could be Roberts' suggestion that the passive fetal descent that ensues when a woman employs spontaneous pushing exerts a protective effect on the perineum by allowing more time for tissue compliance. [23] . Yildirim et al conducted a randomized controlled trial that concluded that women employing the spontaneous pushing technique were more positive about the effectiveness of this technique and recounted lesser issues with pain, difficulty in

breathing, or discomfort while pushing. [18] Research has also shown a risk of pelvic floor dysfunction among women who are directed to push during childbirth. [22]

This study was conducted to evaluate the safety of the rampantly observed practice of the coached Valsalva-type pushing method over the spontaneous pushing method in terms of perineal trauma. As detailed above, some studies favour the spontaneous pushing method as being protective of the perineum while others state that there is no association between the pushing method employed and the rate of perineal trauma. Our study falls in the latter group. In both cases, it is at least evident that spontaneous pushing poses no significant harm to the mother or fetus during delivery. In fact, it is even the preferred method when considering its protective effect on uteroplacental perfusion (and hence the fetus) and the higher maternal satisfaction rates with spontaneous pushing. Hence, even with our study's results of no association with the rate of perineal trauma, spontaneous pushing should be encouraged on account of its other benefits. Therefore, it is imperative that clinicians and midwives be made aware of this data so they can apply this knowledge to their clinical practice.

This is a strong study in terms of the fact that even though it was not carried out on a very large sample size, there were an equal amount of people in both groups. Also, the effect of any identifiable confounders was attempted to be minimized by the process of stratification during the computation of the results. The external validity of this study might be limited to some extent on account of the fact that the participants consisted entirely of people with Pakistani origin but since studies of this kind have already been conducted on other populations, one can overlook that fact. Especially since one of the main driving motives behind conducting this study was to determine whether the results of foreign studies with the same objective are in concordance with our population too. This is the first study in Pakistan that sought to determine any existence of a relationship or association between perineal trauma and the pushing methods employed during the second stage of labour, and hence can serve as the footing for more such studies, if needed. Furthermore, since the patient population of our study setting comprises of people from all over the country, this study can be assumed to be representative of the whole population of Pakistan, with all of its provinces.

CONCLUSION

In summary, our findings suggest that there is no association between the frequency of perineal trauma among patients who underwent the directed Valsalva- type method of pushing and those that employed the spontaneous pushing method. This knowledge is of significance for health care providers in the labour room when managing the second stage of labour, especially in settings where spontaneous pushing has been presumed hazardous on account of mere heresay. Recognition of this information made even more crucial when considering the better patient satisfaction levels and neonatal outcomes documented by other studies with the spontaneous pushing method. Speaking of which, further research could be directed to determining neonatal outcomes in Pakistan with different pushing methods, considering they are also a huge concern of patients, attendants and health care providers alike.

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