



Original Article

Perineal length among Vietnamese women



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ABSTRACT

Objective: Vietnamese clinicians routinely perform episiotomies in the belief that 3rd–4th degree tears may be prevented, based partly on the view that Vietnamese women have a short perineal length that puts them at increased risk of tears. However, there is no evidence to suggest Vietnamese women have a short perineum compared with other populations. We aimed to determine the mean perineal length among Vietnamese women in early labor and in the second stage, and to compare this to findings from similar studies in other populations.

Materials and methods: We undertook an observational study in a tertiary obstetric hospital in Vietnam from October 2014 to June 2015. Pregnant women who presented in early labor with a live singleton cephalic presentation at ≥ 37 weeks gestation were eligible. Perineal length was measured early in the 1st stage of labor (≤ 4 cm dilation) and in 2nd stage of labor (10 cm dilation). Mean perineal length was compared to other populations using *t*-tests.

Results: Of 395 women, 159 (40.3%) were nulliparous and 236 (59.8%) multiparous. Overall the mean perineal length in early labor was 3.4 cm (± 0.4), and did not differ by parity. Mean perineal length among Vietnamese women was significantly shorter ($P < 0.001$) than other populations (means 3.8–4.6 cm). Among 365 women who reached 2nd stage the mean perineal length was 4.3 cm (± 0.6).

Conclusion: The perception that Vietnamese women have a relatively shorter perineal length appears to have some basis and outcomes reported from episiotomy trials may not be generalizable to Vietnamese women.

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Introduction

Episiotomy is the most common obstetric procedure practiced worldwide [1–3]. Vietnamese clinicians routinely perform episiotomies in the belief that 3rd–4th degree tears may be prevented, based, partly, on the view that Vietnamese women have a shorter perineal length that puts them at increased risk of these tears [4]. Cambodian obstetricians and midwives similarly believe that Cambodian women have shorter, less elastic perineums than Caucasian women and that this justifies routine episiotomy (95% episiotomy rate) [5]. This is in contrast to a Cochrane review of eight randomized controlled trials which found that compared to routine

episiotomy, selective episiotomy is associated with a reduced rate of 3rd and 4th degree perineal tears [1]. However, it is noteworthy that South East Asian women were not represented in any of the existing randomized trials.

Third and 4th degree perineal tears (also referred to as severe perineal trauma or obstetric anal sphincter injuries [OASIS]) refer to lacerations that extend to the anal sphincter and disrupts the anal sphincter musculature (third degree tear) or into the anal mucosa (fourth degree tear) [6]. In addition to long term adverse physical and psychological outcomes (pain, faecal incontinence, sexual dysfunction and lifestyle alteration), OASIS can result in increased duration of hospitalization or readmission for repair [7,8]. In high income countries, Asian women are reported to be at increased risk for both episiotomy and OASIS [9–13]. These risks persist after adjustment for other risk factors such as parity, instrumental delivery and birthweight.

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Perineal length is the distance between the posterior fourchette and the midpoint of the anal canal. Shorter perineal length is associated with an increased risk of significant perineal injury [14–17]. There is a perception that among Asian women, physiological and anatomical differences, such as a short perineal length [5,15–17], explain their increased risk of perineal trauma [9–13].

Currently, studies reporting perineal length have been undertaken in populations from the United States [15], United Kingdom [18], the Middle East [16] and Hong Kong [19], but not Vietnam. Therefore, the primary aim of this study among Vietnamese women was to determine the mean perineal length in early first stage and in the second stage of labor, and to compare this to findings from similar studies in other populations. We hypothesized that Vietnamese women would have a similar mean perineal length to other obstetric populations, and that this information could be used to reassure clinicians that a lower episiotomy rate is achievable [4].

Materials and methods

We undertook a cross sectional, observational study in the public delivery suite of Hung Vuong Hospital from October 2014 to June 2015. Hung Vuong Hospital is a tertiary obstetric hospital in Ho Chi Minh City with approximately 16,000 public patients birthing each year. The study population included pregnant women who presented in early labor with a live singleton cephalic presentation at ≥ 37 weeks of gestation, who planned to deliver vaginally and gave written informed consent to participate in the study.

The outcomes were perineal length early in the 1st stage of labor (≤ 4 cm dilation) and in the 2nd stage of labor (on reaching 10 cm dilation). Perineal length was measured with the woman lying on her back with flexed knees. A single-use, disposable, paper tape measure was used to measure the distance from the fourchette to the center of the anus in centimeters (cm) [15–19]. The perineal length measurements were made by 8 midwives who were trained by the investigators (AT, TN) prior to commencement of the study. Trainee and trainer independently measured perineal lengths on eligible women until 4–5 consecutive measurements were the same to the nearest millimeter. In practice this was typically achieved after assessing 5–6 women.

The study procedure was that a research midwife approached women in early labor soon after admission to the prelabor room, and recorded the number of women approached. She explained the study and obtained informed consent and contact information for follow-up (including a personal and a relative's phone number), collected baseline data, measured the perineal length and recorded the cervical dilation. Baseline data included maternal age, ethnicity (Vietnamese or not), parity, level of education, occupation, gestational age, number of previous episiotomies, previous caesarean section(s), and maternal height and weight for calculation of body mass index (kg/m^2). The interval between the 1st and 2nd stage perineal length measurements was also recorded, as was the duration of both 1st and 2nd stage of labor, use and type of analgesia, fetal presentation, operative delivery, episiotomy, infant gender and birthweight. There was no missing information for any of the women recruited to the study. Ethics approval was obtained from the Institutional Review Board of Hung Vuong Hospital.

Data analysis

The sample size calculation was based on the desired precision of the mean perineal length and an expected perineal length in the 1st stage of labor of 3.9 cm (standard deviation ± 1.0 cm) [18]. A

sample of 400 women was required to obtain a 95% confidence interval of ± 1.0 cm around the mean perineal length.

Participant characteristics and postpartum care were described using frequency tabulations and contingency tables, including mean (\pm standard deviation) and median (interquartile range [IQR]) perineal length. Maternal and pregnancy factors were assessed for an association with short perineal length, defined as less than or equal to one standard deviation below the mean perineal length. To allow comparison with published data, analyses were stratified by parity. Nulliparas and multiparas were compared on maternal (e.g., age, education, BMI) and birth characteristics (e.g. type of birth, obstetric interventions) using Chi-squared tests for categorical variables and t-tests for continuous variables. Mean perineal length was compared to findings from published studies of mean perineal length in first stage of labor and at second stage of labor using t-tests.

Results

Although a formal log of women approached was not maintained as anticipated, midwives report that over 90% of women approached agreed to participate in the study. Of 408 women recruited by the trained research midwives, 13 were excluded because they were not in the early stage of labor (cervical dilatation > 4 cm).

Of the remaining 395 women in the final study population, 159 (40.3%) were nulliparous and 236 (59.8%) multiparous. Compared with nulliparas, multiparas were more likely to be older, overweight or obese, and have only primary school education (Table 1). Among multiparas, only 5 (2.1%) women had not previously had an episiotomy including the one woman (0.4%) with a prior birth by caesarean section.

Overall the mean perineal length in early labor was 3.4 cm (± 0.4) (median 3.4 cm IQR 3.0–3.5). Short perineal length (≤ 3.0 cm, $n = 124$, 31.4%) was not associated ($P > 0.25$) with maternal age, parity, body mass index, gestational age or cervical dilation at assessment. However among the 13 women who were not ethnic Vietnamese, only 8% had a short perineum compared to 32% of Vietnamese women ($P = 0.06$).

Mean perineal length was similar for nulliparous and multiparous women (Table 1). Thirty women had an intrapartum caesarean section before the 2nd stage of labor, more commonly among nulliparas (Table 1). For these women only a 1st stage perineal length was available. Among the women who reached 2nd stage the mean perineal length was 4.3 cm (± 0.6) (median 4.3 cm IQR 4.0–4.7) and was again similar for nulliparous and multiparous women (Table 1).

Compared with nulliparas, multiparous women had significantly shorter labor durations, less analgesia, fewer episiotomies and instrumental births, and heavier babies (Table 1). Episiotomy was performed on all nulliparas and 2 (1.5%) women had 3rd degree tears. Forty seven (20.7%) multiparas did not have an episiotomy, and of these 22 (46.8%) had a first degree tear and 2 (1.1%) a 2nd degree tear. No 3rd–4th degree tears were reported among multiparas.

We identified seven studies [14–20] that measured perineal length in the first stage of labor among women with uncomplicated pregnancies and a single cephalic-presenting fetus. We excluded one study [14] where the two investigators got markedly different mean perineal lengths (3.3 ± 0.5 cm versus 4.0 ± 0.5 cm, $P < 0.001$) among women who were similar for height, fetal head circumference and birthweight, suggesting systematic differences and non-comparable measurements. Deering et al. reported an overall mean perineal length of 3.9 ± 0.7 cm among 133 women (56% nulliparas) attending a US Naval hospital [15], a result that

Table 1

Maternal and pregnancy characteristics by parity.

	Nullipara N = 159 n (%)	Multipara N = 236 n (%)	P value ^a
Maternal age			
<20 years	22 (13.8)	4 (1.7)	<0.001
20–24 years	57 (35.9)	33 (14.0)	
25–30 years	62 (39.0)	92 (39.0)	
30–34 years	16 (10.1)	71 (30.1)	
≥35 years	2 (1.3)	36 (15.3)	
Maternal age (years) mean (SD)	24.3 (±4.2)	29.3 (±4.9)	<0.001
BMI ^b			
Normal or underweight	97 (61.0)	106 (44.9)	0.006
Overweight	54 (34.0)	113 (47.9)	
Obese	8 (5.0)	17 (7.2)	
Place of birth			
North Vietnam	17 (10.7)	40 (17.0)	0.21
Central Vietnam	30 (18.9)	39 (16.5)	
South Vietnam	112 (70.4)	157 (66.5)	
Education			
Primary school or none	14 (8.8)	44 (18.6)	<0.001
Secondary/high school	117 (73.6)	176 (74.6)	
Higher education	28 (17.6)	16 (6.8)	
Ethnicity			
Vietnamese	156 (98.1)	226 (95.8)	0.20
Chinese	3 (1.9)	10 (4.2)	
Occupation			
Housewife	35 (22.0)	65 (27.5)	<0.001
Worker	81 (50.9)	135 (57.2)	
Businesswoman	14 (8.8)	25 (10.6)	
Officer	29 (18.2)	11 (4.7)	
Gestation (weeks) mean (SD)	38.9 (±0.9)	38.8 (±1.0)	0.35
Cervical dilation at 1st stage assessment (cm), mean (SD)	2.7 (±0.8)	2.8 (±0.8)	0.80
1st stage perineal length (cm), mean (SD)	3.4 (±0.4)	3.4 (±0.4)	0.52
Intrapartum caesarean section	21 (13.2)	9 (3.8)	<0.001
	N = 138	N = 227	
2nd stage perineal length (cm), mean (SD)	4.3 (±0.6)	4.3 (±0.6)	0.67
Duration of 1st stage (min) median (IQR)	620 (390–960)	480 (865–250)	<0.01
Duration of 2nd stage (min) median (IQR)	20 (10–35)	10 (5–15)	<0.001
Episiotomy	138 (100)	180 (79.3)	<0.001
Analgesia			
None	14 (10.1)	49 (21.6)	0.01
Local	96 (69.6)	147 (64.8)	
Epidural/spinal	28 (20.3)	31 (13.7)	
Mode of delivery			
Spontaneous vaginal birth	114 (82.6)	221 (97.4)	<0.001
Instrumental birth	24 (17.4)	6 (2.6)	
Birthweight (grams) mean (SD)	3085 (317)	3253 (370)	<0.001

^a From *t*-test for means, chi-square tests of categorical variables, Wilcoxon-Mann-Whitney for medians.^b Only one woman was underweight.

was significantly longer than our finding for all Vietnamese women. The remaining five studies reported mean perineal length either among nulliparas or by parity (Table 2). As we found in Vietnamese women, studies from the United Kingdom and Hong Kong found similar perineal length for nulliparas and multiparas [18].

Among nulliparas, the mean perineal length in Vietnamese women of 3.4 cm was significantly shorter ($P < 0.0001$) than all other populations except for Israeli women [17] with no episiotomy ($P = 0.19$) (Table 2). For multiparas, all other populations has significantly longer perineal lengths than Vietnamese women ($P < 0.001$).

Only the Hong Kong study [19] reported perineal length in the second stage of labor. Compared with Vietnamese women, perineal length in Chinese women in the 2nd stage of labor was significantly longer for both nulliparas (4.9 ± 0.9 cm versus 4.3 ± 0.6 cm) and multiparas (5.0 ± 0.8 cm versus 4.3 ± 0.6 cm) regardless of subsequent episiotomy ($P < 0.001$).

Discussion

To our knowledge, this is the first study documenting the mean perineal length of Vietnamese women. We found the mean perineal length in early labor was 3.4 cm and for those women who reached 2nd stage of labor the mean perineal length was 4.3 cm. Measurements were similar regardless of parity. Unexpectedly we found the mean perineal length among Vietnamese women to be significantly shorter than that reported for other populations. This may mean that Vietnamese women are at increased risk of OASIS [14–16], although it is unclear whether routine episiotomy is effective in reducing this risk.

In other populations, mean perineal length in the first stage of labor varies from 3.5 cm [17] to 4.6 cm [16] (most commonly 3.9 cm) [19,20], but at least some of this variation may be due to differences in the duration of the first stage when the measurement was taken. The impact of duration of labor is apparent in the study by Rizk [16] who found a mean perineal length of 4.6 cm but only

Table 2

Comparison of first stage perineal length studies, among uncomplicated singleton pregnancies with a cephalic presentation at term.

Study (location)	Study population	First stage mean perineal length, cm (SD)	
		Nulliparae	Multiparae
Rizk 2000 (United Arab Emirates)	212 Nulliparae Ethnicity: Arab Time of PL measurement: during 1st stage (~40% ≤4 cm cervical dilation)	4.6 (0.9) ^a	
Walfisch 2005 (Israel)	139 nuliparae, 161 multiparae Ethnicity: 117 Israeli-born Jews, 150 Bedouin Arab, 10 Russian Time of PL measurement: cervical dilation 3–4 cm.	No Epis: 3.5 (0.8) ^b Epis: 4.1 (1.2)	–
Dua 2009 (United Kingdom)	457 primigravid, 543 multigravid Ethnicity: 734 white, 250 Indian subcontinent	3.8 (0.9) ^a	3.7 (0.9) ^a
Lai 2009 (Hong Kong)	189 nulliparae, 240 multiparae Ethnicity: Chinese Time of PL measurement: during 1st stage	No Epis: 3.9 (0.8) ^a Epis: 3.9 (0.8) ^a	No Epis: 3.9 (0.8) ^a Epis: 4.0 (0.8) ^a
Tsai 2012 (United States)	200 nulliparae Ethnicity: 31 white, 35 Filipina, 36 Japanese, 31 Chinese, 36 Hawaiian, 31 Micronesian Time of PL measurement: during 1st stage	All: 3.9 (–) ^a White: 3.9 (0.6) ^a Filipina: 4.0 (0.6) ^a Japanese: 3.9 (0.6) ^a Chinese: 3.8 (0.4) ^a Hawaiian: 4.1 (0.9) ^a Micronesian: 3.8 (0.4) ^a	
Current study (Vietnam)	159 nulliparae, 236 multiparae Ethnicity: Vietnamese Time of PL measurement: ≤4 cm cervical dilation	3.4 (0.4)	3.4 (0.4)

Abbreviations: PL-perineal length; Epis-episiotomy, SD-standard deviation.

^a P < 0.0001.^b P = 0.19 P-value for comparison of each study result with the mean perineal length for Vietnamese women of the same parity.

40% of the measurements were taken in early first stage labor. Only two of the previous studies specified that the perineal length measurement was taken early in the first stage of labor [17,19] but the findings of these two studies (mean perineal length range from 3.8 to 4.1 cm) were similar to those where the timing of the perineal measurement was not detailed.

Our study confirms earlier findings that there is no association between perineal length and parity or other maternal factors such as maternal age, height or BMI [15,18,20]. We found a tendency towards a difference in perineal length by ethnicity, limited by the small number of women who were not Vietnamese but consistent with an alternate hypothesis of shorter perineal length among Vietnamese women. In contrast, our finding that perineal length (in both first and second stage) was significantly shorter than that reported for Chinese women in a similar study was unexpected [19]. Apart from ethnicity, the methods and study populations in the two studies were closely aligned and are unlikely to explain the difference in findings. Similarly, Tsai reported perineal lengths for small groups of Filipina, Japanese and Chinese women and these were statistically significant longer compared to our Vietnamese women, although Tsai did not specify when the measurements were taken [20]. Although formal assessment of inter and intra-observer reliability was not feasible in the current study, midwives undertaking the perineal length measurements were trained, eight midwives took measurements and a large number of women were assessed. The perineal length measurements were normally distributed and the standard deviation around the mean was small, reflecting consistent measurements and measurement error is unlikely to explain differences. Thus, the perception that Vietnamese women have a relatively shorter perineal length may have some basis and the outcomes reported for the available randomized controlled trials may not be generalizable to Vietnamese women. It may be unrealistic to expect that episiotomy rates in Vietnam can be reduced to the level reported in many high income countries (e.g. episiotomy rate of 21% in Australia, 19% in England, 19% in Norway) [21,22]. This would be consistent with studies showing

higher episiotomy rates for Asian-born women who deliver in Western countries [9,12].

The strengths of our study include high participation rates in a general maternity population at a large Vietnamese hospital. Perineal length was assessed at specified points in both the 1st and 2nd stage of labor. There were few reports of 3rd and 4th degree perineal tears and questions have been raised previously about the diagnosis and reporting of severe perineal trauma, but this has no bearing on the prior assessment of perineal length [4]. Curiously, several previous studies report perineal length stratified by an outcome (episiotomy) [14,17,19], and no association between perineal length and subsequent episiotomy has been demonstrated. As previously reported for Vietnam [4], use of episiotomy was extremely high in our study.

In conclusion our study suggests that Vietnamese women may truly have a shorter perineal length than other populations. If the episiotomy rate is to be safely reduced in Vietnam, a randomized controlled trial of selective versus routine episiotomy may need to be considered to ensure the benefits outweigh the harms in this population. Such a trial could be pivotal in changing local beliefs about episiotomy.

Ethics approval statement

Ethics approval was obtained from the Institutional Review Board of Hung Vuong Hospital on 14 July 2014.

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Conflicts of interest

The authors have no conflicts of interest relevant to this article.

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