

Severe perineal lacerations during childbirth in Saudi women-a retrospective report from King Abdulaziz University Hospital.

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Abstract

Background: Perineal trauma during child-birth continue despite improved care affecting maternal health and quality of life. This retrospective study aims to identify the risk factors associated with severe perineal lacerations (third and fourth-degree) in women who delivered at King Abdulaziz University hospital (KAUH), Jeddah, Kingdom of Saudi Arabia.

Results: Data related to patient characteristics, labour, delivery, maternal and neonatal outcomes were collected and analyzed using X2 analysis and independent 2-sample t-tests. Descriptive analysis showed that 29.6% had third or fourth-degree perineal lacerations. Most women (60.54%) were multiparous and 54.6% had episiotomy. Their mean age and weight were 27.8 ± 6.03 years and 70.50 ± 15.43 kg respectively. The mean birth weight of the baby was 3.20 ± 0.5 kg.

Conclusions: Analysis for severe lacerations and episiotomy in this retrospective study from KAUH, identified young maternal age, primiparity, prolonged labour, macrosomia and episiotomy as risk factors for third and fourth-degree perineal lacerations.

Keywords: Episiotomy, Macrosomia, Perineal lacerations, Primiparity, Risk factors, Saudi Arabia.

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Introduction

Numerous risk factors contribute to birth related perineal trauma and these include, maternal age, parity, birth weight of the infant, precipitous birth, operative delivery and episiotomy. Obstetrical anal sphincter injuries (OASIS) which encompasses birth related perineal trauma are not uncommon in obstetrical practice and based on the World Health Organization (WHO) International Classification of Diseases, has an incidence of 4% to 6.6% in women following vaginal delivery [1,2]. Therefore, great care and support need to be instituted to ensure safe vaginal deliveries and overcome the problem of spontaneous perineal lacerations.

Perineal trauma results either due to spontaneous tear of perineal tissue occurring during child birth or following episiotomy. Episiotomy is a surgical incision made at the end of the second stage of labour to facilitate delivery of the child as well as to shorten the delivery time and includes various types. Perineal lacerations especially of third and fourth degree are commonly associated with midline episiotomy and

operative deliveries, and their severity is determined based on the depth of the wound [3]. Restrictive episiotomy is relatively better and is associated with lesser posterior perineal trauma and does not carry the risk of post-partum urinary incontinence [4]. Increase in depth and length of the episiotomy incision with the angle of incision being between 30° to 60° are associated with less risk of obstetrics and anal sphincter injuries [5]. Episiotomies although are not done routinely in contemporary obstetric practice, they are still being practiced in some regions especially in primigravida. However, it's liberal use is reported to cause more harm than good [6,7]. Therefore, minimizing the use of episiotomies by itself would lead to reduction in the incidence of perineal lacerations.

Fetal macrosomia (birth weight ≥ 4000 g) is alleged to be associated with increased severity of perineal laceration compared to adequate for gestational age pregnancies; however, a recent retrospective study identified no differences in the rates of excessive perineal lacerations between these two groups [8]. Birth data from a Saudi Arabian study, reported an incidence of 4.5% macrosomia (418 out of 9241 deliveries

conducted in the year 2011 at Maternity and Child Hospital, Qassim, Saudi Arabia). Of these macrosomic pregnancies, 52.4% resulted in vaginal delivery and the incidence of perineal tear as well as cervical lacerations were 1.7% and 0.7% respectively [9]. Various strategies have been explored earlier to reduce the incidence of maternal complications during and following childbirth. In some instances even the use of devices such as the 'sponge perineum' to train residents in the management of fourth degree lacerations [10] and EPI-NO® vaginal birth trainer [11] were identified to be useful in imparting the right training and reduce the rate of episiotomies. We herewith report our own experience on the incidence, ethnicity, risk factors, severity of perineal lacerations and post-partum complications using a retrospective study on women who delivered at King Abdulaziz University Hospital, Jeddah, Kingdom of Saudi Arabia, between January 2000 to December 2011.

Materials and Methods

This retrospective population-based register study included women who gave birth at King Abdulaziz University Hospital (KAUH) between January 2000 to December 2011. Institutional review board approval [015-CEGMR-1-ETH] was obtained for use of patient data presented in this study. Out of total 38, 837 women who had singleton vaginal deliveries, the present study was done on randomly selected 705 cases of patient records containing labour and delivery details. Random selection of the patient case files was done by the staff of KAUH and to avoid bias in screening of data, selection of parameters included in this study were carried out by the research staff of Center of Excellence in Genomic Medicine Research (CEGMR). Statistical evaluation was done independently.

Table 1. Degree of laceration.

Characteristics	Intact/Minor lacerations	3 rd and 4 th degree	Statistical significance
Episiotomy	yes	253 (65.7%)	P<0.05
	no	243 (75.9%)	
Parity	Primiparous	166 (60.4%)	P<0.001
	Multiparous	330 (77.1%)	
Mode of delivery	SVD	476 (73.9%)	P<0.001
	Ventouse assisted	17 (29.8%)	

All recorded information in the labour and delivery registry with regard to patient characteristics, parity, labour and delivery, use of episiotomy, birth-weight of the baby (grams), ethnicity, maternal and fetal outcomes were collected and there were no issues of intra-personal correlation. The inclusion criteria were normal pregnancies with a singleton foetus in normal (cephalic) presentation and all spontaneous labour beyond 20 weeks of gestation (22 preterm, 610 term and 73

post-term). Perineal traumas and their severity were assessed based on the classification by the Royal College of Obstetricians and Gynaecologists [12]. A third and fourth degree tear were defined as an injury to the perineum involving the anal sphincter muscles and rectal mucosa respectively. Data on the presence and absence of perineal trauma and any previous perineal repair was also obtained. Outcome measures included severity of perineal lacerations, perineal repair and care as well as post-partum blood loss.

Table 2. Analysis of laceration.

Characteristics	Intact/Minor lacerations	3 rd and 4 th degree	Statistical significance
Number of delivery (term)	2.04 ± 2.4 SD (n=495)	1 ± 1.80 SD (n=205)	P<0.001
Duration of labor	6.87 ± 3.2 SD (n=492)	8.10 ± 3.34 SD (n=208)	P<0.001
Birth weight of baby	3.15 ± 0.49 SD (n=496)	3.32 ± 0.49 SD (n=208)	P<0.001
Blood loss (ml)	210.91 ± 126.19 SD (n=495)	286.36 ± 190.60 SD (n=206)	P<0.001

Data were entered, cross-checked for accuracy and statistical analysis done using statistical package for social sciences version 18 (SPSS Inc., Chicago, Illinois, USA). Regression analyses were performed using univariate logistic regression to assess the association of the presence of severe lacerations and episiotomy with each of the variables using X² analysis and independent 2-sample t-tests to compare the group between the maternal age and birth weight. Data are summarized as mean ± SD or as a percentage according to the variables studied and a p value<0.05 was considered statistically significant.

Results

There were 22 different ethnic groups comprising mainly of the Saudi population (423, 60%); while the non-saudi population included Yemeni (89, 12.62%), Palestinian (44, 6.24%), Indian (26, 3.69%), Pakistani (18, 2.55%), Egyptian (16, 2.27%), Jordanian (14, 1.99%), Filipino, Sudanese, Syrian, Canadian (11 each, 1.56%), Burmese (1.14%), Eritrean (8, 1.13%), Bangladeshi (4, 0.57%), Lebanese (3, 0.43%), Indonesian (2, 0.28%), Afghanistani, Ethiopian, Moroccan, Nigerian, Spanish and Thai (1 each, 0.14%). The age group of the women varied between 15 to 47 and the mean maternal age (years) was 27.8 ± 6.03 SD. The mean maternal weight during the gestational was 70.50 ± 15.43 SD (range, 36.0-153.0 kg) and the mean haemoglobin concentration (g/dl) was 11.31 ± 1.40 SD (range, 6.30-14.40 g/dl). More than ninety percent (91.9%) of the patients studied had spontaneous vaginal delivery and 8.1% of women had assisted delivery. Most women in this study group were multiparous (60.54%) and had many pregnancies (range 6-13). The mean birth weight of the baby was 3.28 ± 0.49 (range, 1.24-5.50 kg). The mean post-partum blood loss was 234.77 ± 172.37 mL (range, 10-2000

ml), there being three isolated instances of excessive blood loss (1000, 1500 and 2000 mL).

Table 3. Analysis of episiotomy in relation to maternal factors in child birth.

Characteristics	No Episiotomy	Episiotomy	Statistical significance	
Parity	Primiparous	20 (7.3%)	P<0.001	
	Multiparous	299 (69.9%)		129 (30.1%)
term	Preterm	14 (63.6%)	P<0.001	
	Term	301 (49.3%)		309 (50.7%)
	Post Term	5 (6.8%)		68 (93.2%)
Type of Labour	Spontaneous	308 (48.7%)	P<0.001	
	Induction	3 (5.2%)		55 (94.8%)
	Others	5 (45.5%)		6 (54.5%)
Mode of delivery	SVD	308 (47.8%)	P<0.001	
	Ventouse	10 (17.5%)		47 (82.5%)
Lacerations	Intact/Minor lacerations	243 (49.0%)	P<0.05	
	3rd and 4th Degree	77 (36.8%)		132 (63.2%)

Table 4. Analysis of episiotomy in relation to maternal factors, labour and birth weight of baby.

Characteristics	No Episiotomy	Episiotomy	Statistical significance
Maternal age	30.08 ± 6.24 SD (n=317)	25.68 ± 5.04 SD (n=378)	P<0.001
Weight of mother	72.32 ± 16.73 SD (n=281)	68.38 ± 13.52 SD (n=243)	P<0.05
Duration of labor	5.66 ± 2.76 SD (n=308)	8.49 ± 3.15 SD (n=336)	P<0.001
Birth weight of baby	3.30 ± 0.52 SD (n=319)	3.12 ± 0.47 SD (n=382)	P<0.001
Blood loss (ml)	203 ± 137.8 SD (n=319)	257.70 ± 158.7 SD (n=382)	P<0.001

The following independent variables such as parity, episiotomy, birth weight of the baby, mode of delivery, duration of labour, blood loss during delivery were evaluated to assess the impact on the likelihood of development of 3rd and 4th degree perineal lacerations using direct logistic regression. The applied model in this study was able to distinguish the subjects with severe lacerations and those with intact perineum as all variables were observed to be statistically significant, $\chi^2 (9, N=705) = 110.129, p<0.001$. The variance in laceration status was between 14.9% (Cox and Snell R square) and 21.4% (Nagelkerke R squared) and correctly classified 73.9% of cases. Severe lacerations were encountered in spontaneous vaginal deliveries by nearly

61.54% compared to assisted deliveries (Table 1). In addition, primiparity was associated with increased incidence of severe lacerations by 5.2% compared to multiparity (Table 1). Episiotomy also showed an increase by 26.32% in the incidence of severe lacerations compared to those with no episiotomy (Tables 1 and 3). Birth weight of the baby being more than 4000 grams was identified to be the strongest predictor of lacerations in this model with odds ratio of 8.62 (95% CI 2.848-26.108). The other strongly associated factors leading to increased severity of perineal lacerations were prolonged labour of more than 8 hours and being a primigravida (Table 2). In addition, primiparity and assisted vaginal delivery led to higher incidence of episiotomy which in turn contributed to increased perineal trauma and these results are summarized in Tables 1-4.

Discussion

Maternal complications associated with child birth could be minimized by identifying the modifiable risk factors, improvising our existing techniques and employing possible prevention strategies. A retrospective analysis of our own labour registry data on the multi-ethnic society in Saudi Arabia, which however comprised more than 60% of the Saudi population identified that primiparity, prolonged labour, episiotomy and macrosomia were commonly associated with 3rd and 4th degree perineal lacerations.

In most countries episiotomy is done routinely whether indicated or not unlike in Western countries [13], and usually a mediolateral episiotomy is followed than medial episiotomy, as median episiotomy is well known to be associated with severe perineal and anal sphincter injuries [14]. Episiotomy is not a

routine procedure at KAUH and whenever indicated a mediolateral episiotomy is done; however, our incidence of perineal lacerations are identified to be higher. The Consortium on Safe Labour data involving a large cohort from 19 hospitals and screening of 87, 267 and 71, 170 women for 3rd and 4th degree perineal lacerations reported that nulliparity and episiotomy are the important risk factors [15]. A cross-sectional study comparing primiparous normal vaginal delivery cases of routine and restrictive episiotomy identified that 80% in the restrictive episiotomy group had intact perineum and first degree lacerations, while the routine episiotomy groups had 75% and 15% of 3rd and 4th degree perineal laceration [16]. It should however be noted that restricted use of lateral episiotomy had an inverse correlation with the risk of obstetrics and anal sphincter injuries (OASIS), with OASIS rate being increased by 0.5%-1.0% with decrease in episiotomy rate from 80%-40% [17]. OASIS is associated with long term maternal morbidity, resulting in anal incontinence and this is mostly unrecognized and under reported [18]. Although, nulliparity and episiotomy are established and important risk factors [15], it is observed that many identified risk factors are not modifiable. Nevertheless, unnecessary routine episiotomy are to be avoided.

African Americans have lower incidence of perineal lacerations compared to Caucasians [19]. The present study, although comprised of many different ethnic groups, their overall numbers were small to find any significant association with perineal laceration. In the present study primiparity, prolonged labour and macrosomia to be significantly associated with 3rd and 4th degree perineal lacerations (Tables 1-4). Our results were also similar to a recent case-control study from Israel which identified primiparity, longer duration of second stage of labour, young maternal age, Asian ethnicity, vacuum assisted delivery and heavier birth weight of the newborn to be significantly associated with 3rd and 4th degree perineal tears [20]. Maternal and neonatal morbidity increased significantly when second stage of labour was prolonged for more than 4 hours [21].

The increased incidence of 3rd and 4th degree perineal lacerations observed in our study prompts us to review our current obstetric practice and the modifiable risk factors for an overall improvement in quality of maternal health following childbirth. Univariate analysis showed significant association between episiotomy, primiparity, assisted vaginal delivery, macrosomia and perineal lacerations. Similarly, episiotomy showed strong associations with primiparity, young age of mother, prolonged labour, post-partum blood loss, post-term and assisted delivery. However, it is observed that when multiple factors contribute to 3rd and 4th degree perineal lacerations, identification of high risk clinical cases would very much depend on statistical evaluation methods such as multivariable logistic regression as well as classification and regression trees analysis [21]. Our study is however limited by the fact that the total number of patients that were randomly selected for the study were minimal and inclusion of more numbers would have added benefits. Furthermore having case matched controls and as far as possible equal sample numbers

between the different groups would enable identification of clear associations of ethnicity with disease severity and precise data evaluation and this shall be considered in future.

Either, medical/surgical methods or even home based remedies that will help alleviate the sufferings and overcome the complications associated with perineal lacerations will tremendously contribute to women's health. Use of perineal massage during labour was reported to decrease perineal trauma and associated problems in a study conducted on 396 pregnant women upon their first child birth [22]. Employment of postural changes, delayed pushing and lateral position during the expulsive phase, unlike the traditional method led to significant reduction in assisted vaginal delivery, episiotomy rate and perineal trauma [23,24]. In addition to the physical trauma, women undergo a lot of psychological trauma during and following child birth which needs due consideration. One neglected area both by both the clinicians and other health related professionals including researchers is the post-partum sexual health of the women given the incidences of severe perineal lacerations. Dedicated efforts are to be provided to understand and overcome this issue especially in most conservative societies, which will lead to an overall improvement in holistic health.

Conclusions

This retrospective study is an attempt to understand the existing level of obstetric care at King Abdulaziz University Hospital Jeddah, Kingdom of Saudi Arabia, and identify methods to maintain or improve our current practice to be at par with global standards. Although the study was done on a small cohort of Saudi population, the risk factors such as nulliparity, episiotomy and macrosomia associated with severe perineal lacerations were in line with most studies reported on large cohorts and multicenter evaluations. The fact that very few studies are reported from the middle-eastern region compared to the rest of the world with regard to maternal health following child birth, indicate that much more retrospective and prospective studies are warranted in this area.

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References

1. Fernando RJ, Sultan AH, Radley S, Jones PW, Johanson RB. Management of obstetric anal sphincter injury: systematic review and national practice survey. *BMC Health Services Res* 2002; 13: 9.
2. World Health Organization. International Classification of Diseases (ICD). Geneva (CG): WHO; 2015.

3. Gilstrap LC, Cunningham FG, Van Dorsten JP: Editors. Episiotomy, In: Operative obstetrics. 2nd ed., McGraw-Hill, New York, 2002.
4. Carroli G, Mignini L. Episiotomy for Vaginal Delivery. *Cochrane Data Syst Rev* 2009.
5. Stedenfeldt M, Pirhonen J, Blix E, Wilsgaard T, Vonon B, Øian P. Episiotomy characteristics and risks for obstetric anal sphincter injuries: a case-control study. *Br J Obstet Gynaecol* 2012;119: 724-730.
6. Seijmonsbergen-Schermer AE, Geerts CC, Prins M, van Diem MT, Klomp T, Lagro-Janssen AL, de Jonge A. The use of episiotomy in a low-risk population in the Netherlands: a secondary analysis. *Birth* 2013; 40: 247-255.
7. Carroli G, Belizan J. Episiotomy for vaginal birth. *Cochrane Pregnancy Childbirth* 2003.
8. Weissmann-Brenner A, Simchen MJ, Zilberberg E, Kalter A, Weisz B, Achiron R, Dulitzky M. Maternal and neonatal outcomes of macrosomic pregnancies. *Med Sci Monit* 2012; 18: PH77.
9. Alsammani MA, Ahmed SR. Fetal and maternal outcomes in pregnancies complicated with fetal macrosomia. *N Am J Med Sci* 2012; 4: 283-286.
10. Sparks RA, Beesley AD, Jones AD. The "Sponge Perineum:" An Innovative Method of Teaching Fourth-degree Obstetric Perineal Laceration Repair to Family Medicine Residents. *Fam Med* 2006; 38: 542-544.
11. Kok J, Tan KH, Koh S, Cheng PS, Lim WY, Yew ML, Yeo Gs. Antenatal use of a novel vaginal birth training device by term primiparous women in Singapore. *Singapore Med J* 2004; 45: 318-323.
12. RCOG (2001): Management of Third and Fourth Degree Perineal Tears Following Vaginal Delivery. In RCOG Guideline no. 29. RCOG Press, London.
13. Viswanathan M, Hartmann K, Palmieri R, Lux L, Swinson T, Lohr KN, Gartlehner G, Thorp J Jr. The use of episiotomy in obstetrical care: a systematic review. *Evid Rep Technol Assess* 2005; 112: 1-8.
14. Riskin-Mashiah S, O'Bran-Smith E, Wilkins IA. Risk Factors for Severe Perineal Tear: Can We Do Better? *Am J Perinatology* 2002; 19: 225-234.
15. Landy HJ, Laughon SK, Bailit JL, Kominiarek MA, Gonzalez-Quintero VH, Ramirez M, Haberman S, Hibbard J, Wilkins I, Branch DW, Burkman RT, Gregory K, Hoffman MK, Learman LA, Hatjis C, Vanveldhuisen PC, Reddy UM, Troendle J, Sun L, Zhang J. Consortium on Safe Labor: Characteristics associated with severe perineal and cervical lacerations during vaginal delivery. *Obstet Gynecol* 2011; 117: 627-635.
16. Shahraki AD, Aram S, Pourkabirian S, Khodae S, Choupannejad S. A comparison between early maternal and neonatal complications of restrictive episiotomy and routine episiotomy in primiparous vaginal delivery. *J Res Med Sci* 2011; 16: 1583-1589.
17. Räisänen S, Vehviläinen-Julkunen K, Gissler M, Heinonen S. Hospital-based lateral episiotomy and obstetric anal sphincter injury rates: a retrospective population-based register study. *Am J Obstet Gynecol* 2012; 206: 347 e1-6.
18. Pretlove SJ, Thompson PJ, Tooze-Hobson PM, Radley S, Khan KS. Does the mode of delivery predispose women to anal incontinence in the first year postpartum? A comparative systematic review. *Br J Obstet Gynaecol* 2008; 115: 421-434.
19. Howard D, Davies PS, Delancey JO, Small Y. Differences in Perineal Lacerations in Black and White Primiparas. *Obstet Gynecol* 2000; 96: 622-624.
20. Groutz A, Cohen A, Gold R, Hasson J, Wengier A, Lessing JB, Gordon D. Risk factors for severe perineal injury during childbirth: a case-control study of 60 consecutive cases. *Colorectal Dis* 2011; 13: e216-219.
21. Bleich AT, Alexander JM, McIntire DD, Leveno KJ. An analysis of second-stage labor beyond 3 hours in nulliparous women. *Am J Perinatol* 2012; 29: 717-722.
22. Hamilton EF, Smith S, Yang L, Warrick P, Ciampi A. Third- and fourth-degree perineal lacerations: defining high-risk clinical clusters. *Am J Obstet Gynecol* 2011; 204: 309 e1-6.
23. Karaçam Z, Ekmen H, Calişir H. The use of perineal massage in the second stage of labor and follow-up of postpartum perineal outcomes. *Health Care Women Int* 2012; 33: 697-718.
24. Walker C, Rodríguez T, Herranz A, Espinosa JA, Sánchez E, Espuña-Pons M. Alternative model of birth to reduce the risk of assisted vaginal delivery and perineal trauma. *Int Urogynecol J* 2012; 23: 1249-1256.

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