Factors Related to Obstetric Third and Fourth Degree Perineal Lacerations in a Jamaican Cohort

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ABSTRACT

Objectives: *The aim of this study was to identify significant and modifiable risk factors associated with obstetric third and fourth degree perineal lacerations and to produce recommendations that may reduce their morbidity and prevalence.*

Methods: *This is a retrospective case control study performed between March 2004 and March 2008. All patients diagnosed with third and fourth degree perineal lacerations were identified (cases) along with randomly assigned controls who delivered during the same time period. Nineteen cases and 38 controls were identified giving a total of 57 patients. Each patient's hospital record was collected and the data extracted.*

Results: *When analysed for weight greater than or equal to 3.5 kg versus birthweight of less than 3.5 kg, the difference between cases and controls was found to be statistically significant, with a* p*-value of 0.012. Of the cases, 21% had an operative delivery (forceps or vacuum) whereas only 2.6% of the controls had an operative delivery. This was found to be statistically significant (p = 0.011).*

Conclusion: *This study has shown that the two main factors related to the obstetric third and fourth degree perineal lacerations were babies weighing more than 3.5 kg and the use of forceps or vacuum to assist with deliveries. These high risk patients should be attended to by the most senior staff that is available.*

Keywords: Jamaica, operative vaginal deliveries, perineal lacerations

Factores Relacionados con las Laceraciones Perineales Obstétricas de Tercer y Cuarto Grado en una Cohorte de Jamaica

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RESUMEN

Objetivos: *El objetivo de este estudio fue identificar factores de riesgo modificables y significativos asociados con las laceraciones perineales obstétricas de 3er y 4to grado, y producir recomendaciones que puedan reducir su morbilidad y prevalencia.*

Métodos: *Se trata de un estudio de caso control retrospectivo realizado entre marzo de 2004 y marzo de 2008. Todas las pacientes diagnosticadas con laceraciones perineales de 3er y 4to grado fueron identificadas (casos) con controles asignados de manera aleatoria, que tuvieron el parto en el mismo período de tiempo. Diecinueve casos y 38 controles fueron identificados, para un total de 57 pacientes. Se recogieron y se extrajeron los datos de las historias clínicas de cada paciente.*

Resultados: *Al analizárseles en términos de peso superior o igual a 3.5 kg frente a un peso al nacer por debajo de 3.5 kg, la diferencia entre los controles y los casos resultó ser estadísticamente significativa, con un valor p de 0.012. De los casos, el 21% tuvo un parto operativo (fórceps o vacío), mientras que sólo el 2.6% de los controles tuvo un parto operativo. Esto resultó ser estadísticamente significativo (p = 0.011).*

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Conclusión: *Este estudio ha demostrado que los dos factores principales relacionados con las laceraciones perineales obstétricos de 3er y 4to grado, eran bebés con un peso de más de 3.5 kg y el uso de fórceps o vacío en la asistencia a los partos. Estos pacientes de alto riesgo deben ser atendidos por el personal disponible de mayor experiencia.*

Palabras claves: Jamaica, partos vaginales operativos, laceraciones perineales

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INTRODUCTION

The incidence of third and fourth degree perineal lacerations is thought to be increasing worldwide. However, this may reflect increased vigilance and surveillance in various labour wards (1). One Swedish study found the incidence in 1994 to be 3.4% and in 2004 to be 5.2% (1). Independent factors which were primarily associated with obstetric third and fourth degree perineal lacerations were black race, vacuum extrac-tion and infant weight greater than or equal to 4000 grams (1). A second Swedish study in 2008 found that the incidence of obstetric third and fourth degree perineal lacerations was 9.2% and was highly associated with infant weight greater than 4000 grams and vacuum extraction (2).

There is little doubt that third and fourth degree perineal lacerations in particular, are significant contributory factors in the development of anal incontinence, urinary retention, urinary incontinence and pelvic organ prolapse (3). In the United Kingdom (UK), anal incontinence in the year after birth is thought to affect nearly 40 000 mothers annually (4−6). The importance of training in diagnosing third and fourth degree lacerations of the perineum just after a vaginal delivery is paramount. There is evidence from one study that perineal anatomy is poorly understood by midwives and registrars (7). In that study, 41% of trainees and 16% of midwives were unable to correctly diagnose third and fourth degree perineal lacerations.

Postpartum anal incontinence may affect mothers psychologically as well as physically but many do not seek medical attention because of embarrassment (8). In one study, only one third of individuals with faecal incontinence had discussed the problem with a physician (9). The impact of this complication on mothers is potentially disastrous.

Most authors do not recommend a Caesarean section in women who have suffered an obstetric anal sphincter injury in a previous vaginal delivery; only approximately 0.4% of women underwent Caesarean section where the indication was a sphincter injury (10). The incidence of recurrence of a previous third and fourth degree tear is 4.69% and 7.73% respectively (11).

The aim of this study was to identify significant and modifiable risk factors associated with obstetric third and fourth degree perineal lacerations in women at a tertiary hospital with the hope of reducing the morbidity and prevalence of third and fourth degree perineal lacerations. Statistically significant risk factors identified in this unit can serve to assist in decreasing and eventually preventing the incidence of obstetric third and fourth degree perineal lacerations.

SUBJECTS AND METHODS

This is a retrospective case control study performed between March 2004 and March 2008. All patients with diagnosed third and fourth degree perineal lacerations were identified (cases) along with randomly assigned controls who delivered during the same time period. Nineteen cases and 38 controls were identified giving a total of 57 patients. Each patient's hospital record was collected and the data extracted.

All mothers who had delivered a premature infant (less than 37 weeks of gestation) or those who had a Caesarean section were excluded from the study. Statistical analysis was performed with SPSS version 12 and Pearson's chi-square test was used to determine statistical significance.

Patient identifiers were not included in the data extraction sheet. Each patient was simply designated as a case or a control. This study has been approved by the Faculty of Medical Sciences, The University of the West Indies/ University Hospital of the West Indies, Ethics Committee.

RESULTS

There were 6296 vaginal deliveries at the University Hospital of the West Indies (UHWI) over the study period. Nineteen of these women sustained third and fourth degree lacerations giving an incidence of 0.3%. Fifty-seven patients were analysed and they are summarized in Table 1.

The mean birthweight of the controls was 3.18 kg with a minimum of 1.22 kg and a maximum of 4.16 kg while the mean birthweight of our cases was 3.518 kg with a minimum of 2.90 kg and maximum of 4.14 kg. When analysed for weight greater than or equal to 3.5 kg *versus* birthweight of less than 3.5 kg, the difference between cases and controls was found to be statistically significant ($p = 0.012$). Of the controls, 2.6% had an operative delivery (forceps or vacuum) while 21% of cases had an operative delivery; 10.5% had an application of forceps and 10.5% had an application of vacuum. This was found to be statistically significant ($p = 0.011$).

The results showed that 68.4% of cases and 20.5% of controls received an episiotomy (medio-lateral) prior to delivery of the fetal head however this difference was not found to be statistically significant ($p = 0.111$). However, this

Table 1: Summary of variables analysed

	Case	Control	*p*-value
Age of mother (in years)	26.7 ± 3.4	28.6 ± 6.0	0.313
Gestational age (in weeks)	38 weeks ± 1.16	38 weeks ± 2.2	0.510
Nulliparity	78.9%	43.6%	0.313
Fetal presentation	89.5% vertex	94.7% vertex	0.124
Length of first stage	8 hours: 42 minutes ± 5 hours	6 hours: 48 minutes ± 4 hours	0.334
Length of second stage	25 minutes ± 15	18 minutes ± 13	0.248
Oxytocin augmentation given	66.7%	27%	0.464
Episiotomy performed	68.4%	20.5%	0.111
Operative delivery performed	78.9%	2.6%	0.011
Infant weight	3.518 kg ± 0.4 g	3.1823 kg ± 0.5 kg	0.012
Infant gender	68.4% males	31.6% female	
	46.2% males	53.8% females	0313
Resident delivery	13.3%	4.5%	0.685

analysis should be repeated with a larger sample size; 46.2% of our controls delivered a male fetus while 53.8% of controls delivered a female fetus. While among the cases, 68.4% of the deliveries were male fetuses and 31.6% female fetuses. This trend suggests that a female fetus usually smaller than a male fetus, were less frequently associated with a third and fourth degree lacerations ($p = 0.313$).

DISCUSSION

The true incidence of third and fourth degree lacerations is not known and there have been no Jamaican data until 2008 when the first data on incidence was published and found to be approximately 0.2% at the UHWI (12). This study found an incidence of 0.3%. A systemic review of 451 articles found an incidence of approximately 11% in postpartum women (13). Risk factors included instrumental deliveries, prolonged second stage and birthweight greater than 4000 grams, persistent fetal occipital positions and episiotomies (13). One study in the UK showed an incidence of 25% in first deliveries and the significant risk factors were: an inadequate mediolateral episiotomy, forceps delivery, vacuum extraction, gestational age greater than 40 weeks, head circumference greater than 34 cm and second stage greater than 71 minutes (14).

The very low incidence in this Jamaican cohort may be due to the relatively low incidence of operative vaginal deliveries (forceps 0.5% and vacuum extraction 0.8%) and high rate of Caesarean section (32%) performed in this institution, as was suggested by Bela Kudish *et al* (15) in their 2008 study.

The role and association of episiotomies as a causative rather than protective factor for 3rd and 4th degree perineal lacerations is controversial. De Leeuw *et al* (16), found that episiotomies were only protective when performed during an operative delivery and only when it was a mediolateral episiotomy. Barbier *et al* (17) found that primiparity was associated with third and fourth degree perineal lacerations and Baumann *et al* (18) found that women whose body mass index was greater than 30 kg/m^2 and who smoked had a lower incidence of obstetric third and fourth degree perineal lacerations. Fitzgerald et al (19) found that iatrogenic factors such as forceps and episiotomies were the most common factors associated with third and fourth degree perineal lacerations.

In this study, statistically significant factors were found to be infant birthweight and an operative delivery, while nulliparity was found to be almost statistically significant. This is in keeping with international data. However, internationally, 4 kg is more predictive of third and fourth degree lacerations, while here at The University of the West Indies an infant birthweight of greater than 3.5 kg was predictive of third and fourth degree lacerations. A 2007 study by Lowder *et al* (20) also showed that an infant birthweight of greater than 3.5 kg was predictive of third and fourth degree lacerations.

In this study, only 2.6% of controls had an operative delivery while 78.9% of cases had an operative delivery. In terms of operative deliveries, forceps deliveries could be a causative factor in as many as 20−30% of third and fourth degree perineal lacerations, therefore vacuum extractions should be performed whenever possible (21). In fact, the combination of an episiotomy and forceps delivery act in synergy to increase the incidence of third and fourth degree perineal lacerations (22). Where the episiotomy was performed between 30 degrees and 38 degrees from the midline, the incidence of third and fourth degree perineal lacerations was greater. There was a 50% reduction in sphincter injury for every 6 degrees that the episiotomy was performed away from the midline (23).

There is established data to suggest that episiotomies are associated with third and fourth degree perineal lacerations especially when performed by inadequately trained staff and when placed in the midline and in combination with an instrumental delivery. In our study, 68.4% of cases had an episiotomy performed to shorten the second stage and 20.5% of controls had an episiotomy performed. These findings also suggest that episiotomies are associated with third and fourth degree perineal lacerations.

It is important to point out the limitations of this study. Firstly, the study is based on the experience of a single centre and secondly, it is retrospective with a moderate sample size. However, despite these limitations the conclusions below are acceptable.

In conclusion, every attempt should be made to avoid third and fourth degree perineal lacerations. Skilled birth attendants, adequate examination rooms, proper equipment and adequate training in repairs and post-procedure care such as antibiotics and stool softeners are modifiable factors which may decrease morbidity. By identifying strong predictors of severe genital trauma, patients can be assessed as either high risk (fetal weight greater than or equal to 3.5 kg and requiring forceps or vacuum) or low risk. High risk patients should be attended to by the most senior staff that is available.

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