Incidence and risk factors of perineal tears of pregnant women delivering at a midwife obstetric unit South Africa

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ABSTRACT

Aim: To estimate the incidence and risk factors for perineal tears of low-risk pregnant women delivering at a midwife obstetric unit.

Methods: A retrospective study performed on perineal tear during childbirth from birth register at midwife run unit in Durban municipality, South Africa between January 2018 and October 2019. Risk factors were studied and bivariate and logistic regression done. Results are expressed with adjusted odds ratios (OR) and p-values <0.05 are considered significant.

Results: A total of 1578 women had singleton vaginal childbirths. Half (50.6%) of them had perineal tears. The incidences of episiotomy, combined first-and second, and third-and fourth-degree (OASI) tears are 24.3%, 25.1% and 1.1% respectively. Risk factors for any perineal tears are younger mothers (teenage OR=2.9, 20-24 years OR=2.2), primipara (OR=15.8), received antenatal care (OR=.47) and gestational age (GA) (<32 weeks OR=.05). The risk factors for episiotomy are: teenage (OR=5.4), ages 20-24 years (OR=4.2), ages 25-29 years (OR=3.0), primipara (OR=12.4), GA (<32 weeks OR=.16), GA 33-36 weeks (OR=.6) and having antenatal care (OR=.41). Birth weight <2.5 kg and between 2.5-3.0 kgs (OR=.014 and .09 respectively) are protective for OASI.

Conclusions: Risk factors for the perineal injuries are similar to those previously reported in other studies. Training of midwives on perineal care and selection for undertaking episiotomy is urgently needed to improve maternity services at the midwife obstetric unit. Identification of those at risk may reduce obstetric perineal injury.

Keywords: episiotomy, low risk pregnancy, midwife obstetric unit

INTRODUCTION

Major degree of perineal tear like third and fourth-degree tear involves the anal sphincter complex with or without rectal mucosa (OASI) during childbirth is considered as a severe form of perineal injury that may lead to short and long-term negative consequences for mothers, such as pelvic floor disorders and anal incontinence.1-3
Methods

A cross-sectional retrospective study was done for singleton vaginal birth at Kwadabeka Community Health Centre (KCHC), a peri-urban primary health care (PHC) facility setting of Durban Metropolitan city in SA, run by qualified midwives using the SA national protocol and guidelines where no interventions such as use of oxytocin, vacuum extraction and fundal pressure or forceps are used. Official birth registers kept by trained midwives at the center from January 2018 to October 2019 was used for the study. The birth register contained minimum variables such as age, parity, antenatal care history, Apgar scores, perineal injuries of mothers and delivery outcomes.

Microsoft Excel and SPSS version 22 were used for data entry and analysis. Bivariate analysis of independent and dependent variables done using Chi square test ($\chi^2$) to identify the factors associated with outcome variables; binary logistic regression analysis used to determine the possible predictors for outcome variables and expressed with adjusted odds ratios (OR) with corresponding two-sided 95% confidence intervals.

intervals (95% CI). Ethical approval (UHERB-015/2020) was taken.

**RESULTS**

A total of 1578 women had vaginal singleton childbirth during the study period. More than half of them (58.2%) were ages between 20-29 years. Teenage and women ≥35 years of ages were 15% and 8.2% respectively. Over half (51.8%) of them had parity between 1 and 2. Only a few (1.2%) had ≥5 parity (grand multiparty). Majority of them delivered (84.8%) at term while 2.9% delivered at or before 32 weeks of GA. Only 5.9% of them never initiated (unbooked) ANC. Majority of the women (75.2%) had between 5 and 7 ANC visits, and only a quarter (24.8%) had 8 or more ANC visit during pregnancy. Positive HIV status was 41.4% among these women. Half (50.4%) of them had perineal tears. The spontaneous and induced (episiotomy) tear rates were 25.9% and 24.3% respectively. The proportion of spontaneous first, second-degree and OASI perineal tears were 5.6%, 19.2% and 1.1% respectively. However, 9 (0.6%) had both episiotomy and OASI. [Table-1]

The age, parity, antenatal care and GA are the predictors for episiotomy in the final step of logistic regression output; teenagers 5.4 times (OR=5.4, 95% CI;1.74-16.95, p=0.003), ages 20-24 years 4.2 times (OR=4.2, 95% CI;1.45-12.73, p=0.009) and ages 25-29 years 3 times (OR=3.0, 95% CI;1.03-9.2, p=0.043) more likely to have an episiotomy respectively. Primiparous women were 12.4 times (OR=12.4, 95% CI;1.48-104.8, p=0.02) more likely to have an episiotomy. On the other hand, having antenatal care and lower GA had protective effects on episiotomy. Having antenatal care, 59% (OR=.41, 95% CI;.17:.97, p=0.04), GA < 32 weeks, 84% (OR=.16, 95% CI;.0-.51, p=.002) and GA 33-36 weeks, 40% (OR=.6, 95% CI;.37-.97, p=0.039) less likely to have episiotomy. [Table-2]

<table>
<thead>
<tr>
<th>Variables</th>
<th>p-value</th>
<th>Adjusted odds ratio (OR)</th>
<th>95% CI for OR Lower</th>
<th>95% CI for OR Upper</th>
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<tbody>
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<td></td>
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<td>.841</td>
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<td>.050</td>
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*Reference group for age ≥ 35 years, Parity ≥ 5 and GA ≥ 37 weeks, No Antenatal care*
Table 1: Baseline variables and outcome variables of the study population

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<tr>
<th>Variables</th>
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<th>%</th>
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<td>25-29</td>
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<td>Positive</td>
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<td>1-4</td>
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<td>5-7</td>
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<td>2.5-3.0</td>
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<td>3.1-3.5</td>
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<td>24.3</td>
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<td>1st degree</td>
<td>88</td>
<td>5.9</td>
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<tr>
<td>2nd degree</td>
<td>284</td>
<td>19.2</td>
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<tr>
<td>3rd and 4th degree</td>
<td>17</td>
<td>1.1</td>
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Risk factors for all perineal tears were younger ages of the women e.g., teenagers (age < 20 years) 2.9 times (OR=2.9, 95% CI; 1.4-5.9, p=0.003) and ages 20-24 years, 2.2 times (OR=2.25, 95% CI; 1.25-3.94, p=0.006) more likely to have any perineal tears. Primiparous mothers were 15.8 (OR=45.8, 95% CI; 3.2-76.9, p=0.001) times more likely to have any perineal tears. On the contrary, mothers who received antenatal care 53% (OR=.47, 95% CI; .24-.94, p=0.033) and GA <32 weeks 95% (OR=.05, 95% CI; .01-.17, p=0.000) less likely to have any perineal tears. [Table 3]

Birth weight of the newborn was the only predictor for OASI. Birth weights <2.5 kg and 2.5-3.0 kgs were 99% (OR=.01, 95% CI; .001-.328, p=0.008) and 91% (OR=.09, 95% CI; .011-.729, p=0.024) less likely to have OASI. [Table 4]
Table 3: Logistic regression output for all perineal tears

<table>
<thead>
<tr>
<th>Variables</th>
<th>p-value</th>
<th>Adjusted odds ratio (OR)</th>
<th>95% CI OR Lower</th>
<th>95% CI OR Upper</th>
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<td>2.227</td>
<td>1.256</td>
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<tr>
<td>Age 20-24 years</td>
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<td>1.268</td>
<td>.733</td>
<td>2.193</td>
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<tr>
<td>Age 25-29 years</td>
<td>.396</td>
<td>1.482</td>
<td>.848</td>
<td>2.589</td>
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<tr>
<td>Age 30-34 years</td>
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</tr>
<tr>
<td>Parity nil</td>
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<td>15.855</td>
<td>3.267</td>
<td>76.958</td>
</tr>
<tr>
<td>Parity 1-2</td>
<td>.160</td>
<td>3.017</td>
<td>.647</td>
<td>14.070</td>
</tr>
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<td>Parity 3-4</td>
<td>.583</td>
<td>1.549</td>
<td>.325</td>
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<td>Received ANC</td>
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<td>.242</td>
<td>.943</td>
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<td>GA coded</td>
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<td>.000</td>
<td>.019</td>
<td>.178</td>
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<td>GA 33-36 weeks</td>
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Reference group for age ≥ 35 years, Parity ≥ 5, booked for ANC (no) and GA ≥ 37 weeks

Table 4: Logistic regression output for OASI

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<tr>
<th>Variables</th>
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<td>GA &lt; 32 weeks</td>
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<td>.000</td>
<td>.000</td>
<td>.000</td>
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<tr>
<td>GA 33-36 weeks</td>
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<td>5.529</td>
<td>.687</td>
<td>44.517</td>
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<td>Birth weight coded</td>
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<td></td>
<td></td>
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<tr>
<td>Birth weight &lt; 2.5 kg</td>
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<td>.014</td>
<td>.001</td>
<td>.328</td>
</tr>
<tr>
<td>Birth weight 2.5-3.0 Kg</td>
<td>.024</td>
<td>.090</td>
<td>.011</td>
<td>.729</td>
</tr>
<tr>
<td>Birth weight 3.01-3.5 Kg</td>
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<td>.207</td>
<td>.033</td>
<td>1.317</td>
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<td>.090</td>
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Reference group for birth weight > 3.5 kg

**DISCUSSION**

This study estimates the incidences of all types of perineal tears and assesses the risk factors for different types of perineal tears. The total perineal tears of 50% among these pregnant women are higher than the rate of 16.2% in Durban hospitals. However, the study from Durban does not define or classify perineal tears in that study. Comparatively the total perineal tear rate in our study is lower than the rates found in Brazil (64%), Tanzania (80%) and England (85%). The incidences of perineal tears are also found higher among black African pregnant women than among other races. The incidence of any perineal tear is found to markedly vary between differ-
ent study settings, with the incidence being higher in hospital compared to community settings found in Sweden and Nicaragua.\textsuperscript{6,17}

The spontaneous first- and second-degree perineal injuries (combined) are 25.9\% in our study and is similar to the rate of 23\% estimated from pooled data of a meta-analysis from LMIC.\textsuperscript{14} Both these injuries, though considered minor, still warrant special attention, especially second-degree tears as it affects the perineal muscles. Though muscular injury is classified as a second-degree injury and is equivalent to an episiotomy, both types of injuries require surgical repairs. These injuries often become worse, especially if the injuries involve the levator ani muscle, it can then progress to pelvic floor disorders in later life.\textsuperscript{18} Risk factors for any perineal tears are well documented in previous reports. Younger ages (teenage <20 years and ages between 20-29 years), nulliparous pregnant women show association for all perineal tears in our study, of which are all recognized in earlier reports.\textsuperscript{17-20} The relative inelasticity of the perineum in nulliparous women may lead to perineal tears and require episiotomy compared to multiparous women which is reduced after one or more deliveries.\textsuperscript{22} In our study, gestational age <32 weeks are 95\% less likely to have perineal tears than term pregnancy. Not many studies looked at gestational age as a risk factor for perineal injury. A case control study from a tertiary hospital in Cape Town (SA) found no association of perineal tears with gestational age.\textsuperscript{12} We understand that as gestational age advances, the foetus grows (with the exception of intra-uterine growth retardation) and the foetus thus gains weight. These two factors (advanced gestational age and heavier baby weight) are interrelated and therefore both of these factors are found with increased risk for perineal tears in our study and is concurrent with the findings in other studies.\textsuperscript{13,19}

The episiotomy rate in our study is also higher of 24.3\% compared to the rate recommended by WHO and the type of pregnant women (low-risk) delivering at a MOU.\textsuperscript{22} However, this rate is lower compared to the report from Ethiopia where an episiotomy rate was 35\%.\textsuperscript{23} However, the rate is higher than the rate reported from France with a national average of 14.1\% for all non-operative vaginal deliveries and Vietnam (15.1\%).\textsuperscript{24,25} The possible reason for this high incidence of episiotomy in our study is possibly due to the fact that episiotomy is undertaken to fasten the delivery in the absence of other intervention such as instrumental deliveries (Forceps or Vacuum extraction). It is important to note that 9 (0.6\%) of the 17 women had OASI despite of episiotomy. However, our finding does not find any association of episiotomy and OASI (protective or risk factor). It is reported from Australia that episiotomy is associated with minimising OASI when assisted vaginal delivery is conducted using forceps.\textsuperscript{26} In our set up no forceps or other assisted (vacuum) deliveries are undertaken.

The factors found independently associated with undertaking episiotomy in our study are younger ages (teenage, OR=5.4; ages between 20-24 years, OR=4.2 and ages 25-29 years, OR=3.0), primipara women (OR=12.4) and gestational age (GA≤32 weeks, OR=.16, GA 33-36 weeks, OR=.60),
CONCLUSIONS

The risk factors identified for the perineal tear are not different from global data. Identification of pregnant women at risk might result in appropriate and timely interventions that minimize the complications and reduce perineal tears at childbirth. Midwives from MOU facilities need to have advanced training, skills and knowledge of pelvic and perineal anatomy, so as to prevent injuries during labour.

Acknowledgements

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REFERENCES

6. Lindgren HE, Radestad IJ, Christensson K, Hildingsson IM. Outcome of planned home...


