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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 child birth

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

These injuries including episiotomies are among the few indicators used for outcome measures associated with quality of obstetrical care.^{4,5} Episiotomy is more on higher health facility to prevent major tear that occurs more on lower health facility and at home delivery.⁶ Higher rates of overall perineal tears are reported from England (85%) and Iran (84.3%).^{7,8} The lowest incidence of 64% among low-risk pregnancies is reported from Brazil (2018).⁹

Known risk factors for perineal tears include maternal factors such as age, parity, precipitated labour and a very narrow introitus, foetal factors such as large foetus and malpresentation. The obstetric care such as uncontrolled or precipitated delivery, assisted deliveries, episiotomy, and extended episiotomy in emergency are some of the known risk factors those lead to perineal tears.^{10,11} Risk factors from SA reported for OASI are malpresentation, primipara, assisted childbirths, mothers' negative HIV status and excessive birth weight of the new-borns.^{12,13} A recent systemic review of "Birth-Related Trauma" from Low-and Middle-Income Countries (LMIC) reports that the overall episiotomy, second degree tear and OASI rates are 46%, 24%, and 1.4% respectively.¹⁴

The most published reports on perineal tears are found from high- and middle-income countries and from hospital settings where skilled birth attendants take care of childbirths. There is limited information from midwife run obstetric unit (MOU) in South Africa (SA) where midwives manage childbirths. The objectives of this study are to estimate the incidence and risk factors for all perineal tears, OASI and episiot-

omy of women giving childbirths at a MOU.

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.¹⁵ 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, gestational age, time of admission, time of delivery, birth weight of babies measured in kilograms (Kgs), antenatal care history, Apgar scores, perineal injuries of mothers and delivery outcomes. The independent variables were age, parity, ANC booking, ANC booking before 20 weeks, number of ANC visits and HIV status. The outcome variables for the study were perineal injuries categorized into induced (episiotomy) and spontaneous injuries (first, second degrees and OASI). 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 (χ^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 (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

ution 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-2: Logistic regression output for episiotomy

Variables	p-value	Adjusted odds ratio (OR)	95% CI for OR	
			Lower	Upper
Age coded	.005			
Age < 20 years	.003	5.442	1.746	16.957
Age 20-24 years	.009	4.297	1.450	12.738
Age 25-29 years	.043	3.097	1.038	9.246
Age 30-34 years	.100	2.482	.841	7.326
Parity coded	.000			
Parity nil	.020	12.466	1.483	104.803
Parity 1-2	.799	1.314	.160	10.783
Parity 3-4	.605	.562	.063	4.996
Received antenatal Care	.019			
Antenatal care (Yes)	.042	.415	.178	.970
GA coded	.002			
GA ≤ 32 weeks	.002	.161	.050	.516
GA 32-36 weeks	.039	.606	.376	.976
Constant	.008	.050		

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

Variables	Frequency	%	
Age in years (n=1485)	<20	220	14.8
	20-24	427	28.8
	25-29	436	29.4
	30-34	280	18.9
	≥35	122	8.2
Gestational age in weeks (n=1476)	< 32	41	2.9
	32-36	174	12.3
	≥37	1201	84.8
Parity (n= 1480)	0	455	30.7
	1-2	817	55.2
	3-4	189	12.8
	≥5	19	1.3
Booked for ANC (n=1418)	No	83	5.9
	Yes	1335	94.1
HIV status (n=1481)	Negative	827	55.8
	Positive	654	44.2
No. of Antenatal visits (n=1438)	0	89	6.2
	1-4	434	30.2
	5-7	559	38.9
	≥8	356	24.8
Gender of the baby n=1399)	Male	685	49.0
	Female	714	51.0
Birth weight in Kg (n=1411)	<2.5	147	10.4
	2.5-3.0	544	38.6
	3.1-3.5	539	38.2
	>3.5	181	12.8
Perineal injury (n=1479)	Intact	731	49.4
	Episiotomy	359	24.3
	1 st degree	88	5.9
	2 nd degree	284	19.2
	3 rd and 4 th degree	17	1.1

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=.014, 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

Variables	p-value	Adjusted odds ratio (OR)	95% CI OR	
			Lower	Upper
Age coded	.001			
Age < 20 years	.003	2.929	1.449	5.919
Age 20-24 years	.006	2.227	1.256	3.948
Age 25-29 years	.396	1.268	.733	2.193
Age 30-34 years	.167	1.482	.848	2.589
Parity coded	.000			
Parity nil	.001	15.855	3.267	76.958
Parity 1-2	.160	3.017	.647	14.070
Parity 3-4	.583	1.549	.325	7.383
Received ANC	.033	.477	.242	.943
GA coded	.000			
GA ≤ 32 weeks	.000	.058	.019	.178
GA 33-36 weeks	.078	.710	.485	1.039
Constant	.020	.162		

Reference group for age ≥ 35 years, Parity ≥ 5, booked for ANC (no) and GA ≥ 37 weeks

Table-4: Logistic regression output for OASI

Variables	p-values	Adjusted odds ratio (OR)	95% CI for OR	
			Lower	Upper
GA coded	.275			
GA < 32 weeks	.998	.000	.000	.
GA 33-36 weeks	.108	5.529	.687	44.517
Birth weight coded	.053			
Birth weight < 2.5 kg	.008	.014	.001	.328
Birth weight 2.5-3.0 Kg	.024	.090	.011	.729
Birth weight 3.01-3.5 Kg	.095	.207	.033	1.317
Age coded	.152			
Age < 20 years	.724	1.695	.090	31.762
Age 20-29 years	.099	6.574	.704	61.414
Constant	.079	.134		

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.¹³ 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%).^{7,9,16} The incidences of perineal tears are also found higher among black African pregnant women than among other races.^{13,16} 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.^{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.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.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.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.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.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.^{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.²² However, this rate is lower compared to the report from Ethiopia where an episiotomy rate was 35%.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%).^{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.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),

and is similar to other reports from Africa and elsewhere.^{23,24}

Pregnant women who receive antenatal care during pregnancy are found to be protective (OR=.45) against episiotomy. There is a previous report which highlights that antenatal care during the antenatal period can reduce perineal injuries and or episiotomy.²⁵ Antenatal education during antenatal contact is found to prepare pregnant women for delivery and the postpartum period, subsequently impacting positively on perinatal wound healing and compliance of wound care.²⁸ However, we can assume that health education, reassurance and the rapport developed during the antenatal period between the midwife and the expectant mother might possibly improve cooperation, reduce psychological stress leading to softening of the perineum and proper and timely bearing down of the baby during strong uterine contractions, leading to avoid an episiotomy and or other perineal injuries.

The OASI in our study is low of 1.1%. This rate is similar to the rates found in Brazil (0.75% for low-risk pregnancies) and in Mexico (0.8% for all vaginal deliveries).^{10,29} The OASI rate in Durban hospital deliveries is 4.1%.¹³ The possible reasons for the low rate of OASI in our study could be due to low-risk pregnant women who are delivered by the midwives with a higher rate of episiotomy. The misdiagnosis and underreporting of major perineal injuries cannot be ruled out as suggested by others.^{24,29} However, underreporting is less likely as all OASI cases are referred to hospital for surgical repair of the anal sphincter. Several studies suggest that heavier birth weight of babies at delivery is associated with OASI and is similar to our results of low birth weight, which is highly protective for OASI.^{6,19,24,26}

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.

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REFERENCES

1. Royal College of Obstetricians and Gynaecologists. Maternity dashboard: clinical performance and governance score card. 2008. Available online at: www.rcog.org.uk.
2. LaCross A, Groff M, Smaldone A. Obstetric anal sphincter injury and anal incontinence following vaginal birth: a systematic review and meta-analysis. *J Midwifery Womens Health*. 2015;60:37–47.
3. Handa VL, Blomquist JL, McDermott KC, Friedman S, Muñoz A. Pelvic floor disorders after vaginal birth: effect of episiotomy, perineal laceration, and operative birth. *Obstet Gynecol*. 2012;119:233- 9.
4. Australian Institute of Health and Welfare. Towards National Indicators of Safety and Quality in Health Care. Cat. no. HSE 75. Canberra: AIHW, 2009.
5. World Health Organization. Standards for improving quality of maternal and newborn care in health facilities. Geneva: WHO, 2016
6. Lindgren HE, Radestad IJ, Christensson K, Hildingsson IM. Outcome of planned home

- births compared to hospital births in Sweden between 1992 and 2004. A population-based register study. *Acta Obstet Gynecol Scand.* 2008;87:751-9.
7. Smith LA, Price N, Simonite V, Burns EE. Incidence of and risk factors for perineal trauma: a prospective observational study. *BMC Pregnancy Childbirth.* 2013;13:59.
 8. Abedzadeh-Kalahroudi M, Talebian A, Sadat Z, Mesdaghinia E. Perineal trauma: incidence and its risk factors. *J Obstet Gynecol.* 2018;39(2):1-6.
 9. Peppe MV, Stefanello J, Infante BF, Kobayashi MT, Baraldi CO, Brito LGO. Perineal Trauma in a Low-risk Maternity with High Prevalence of Upright Position during the Second Stage of Labor. *Rev Bras Gynecol Obstet.* 2018;40(7):379-83.
 10. de Leeuw JW, Struijk PC, Vierhout ME, Wallenburg HC. Risk factors for third degree perineal ruptures during vaginal delivery. *Br J Obstet Gynecol.* 2011;108:383-7.
 11. Dahlen HG, Ryan M, Homer CSE, Cooke M. An Australian prospective cohort study of risk factors for severe perineal trauma during childbirth. *Midwifery.* 2007;23:196-203.
 12. Juul L, Theron GB. Risk factors for third- and fourth-degree perineal tears during vaginal delivery. *Urogynaecologia.* 2011;25:2.
 13. Naidoo TD, Moodley J. Obstetric perineal injury: risk factors and prevalence in a resource-constrained setting. *Tropical Doc.* 2015;45(4):252-4.
 14. Aguiar M, Farley A, Hope L, Amin A, Shah P, Manaseki-Holland S. Birth-Related Perineal Trauma in Low- and Middle-Income Countries: A Systematic Review and Meta-analysis. *Maternal Child Health J.* 2019;23(8):1048-70.
 15. Department of Health. Guidelines for Maternity Care in South Africa: A Manual for Clinics, Community Health Centers and District Hospitals. 4th ed. Pretoria, South Africa: Department of Health; 2016.
 16. Mantzius J, Rudnicki M, Skovbjerg E, Maro E, Mrema D, Rasch V and Sørensen BL. Perineal trauma following vaginal delivery in a lowincome area: A criterion-based audit. *Int J Nurs Midwifery.* 2020;12(4):113-9
 17. Smith LA, Price N, Simonite V, Burns EE. Incidence of and risk factors for perineal trauma: A prospective observational study. *BMC Pregnancy Childbirth.* 2013;13(1):59.
 18. Webb S, Sherburn M, Ismail KMK. Managing perineal trauma after childbirth. *Br Med J.* 2014;25(349):6829-6829.
 19. Groutz A, Hasson J, Wengier A, Gold R, Skornick-Rapaport A, Lessing JB and Gordon D. Third- and fourth-degree perineal tears: prevalence and risk factors in the third millennium. *Am J Obstet Gynecol.* 2011;204:347.1-4.
 20. Lowder JL, Burrows LJ, Krohn MA, Weber AM. Risk factors for primary and subsequent anal sphincter lacerations: a comparison of cohorts by parity and prior mode of delivery. *Am J Obstet Gynecol.* 2007;196(4):344.1-5.
 21. Moller Bek K, Laurberg S. Intervention during labour: risk factors associated with complete tear of the anal sphincter. *Acta Obstet Gynecol Scand.* 1992;71(7):520-4.
 22. World Health Organization. Standards for improving quality of maternal and newborn care in health facilities. Geneva: World Health Organization, 2016.
 23. Worku SA, Mitku YM, Getahun SA. Episiotomy practice and its associated factor among women who gave birth at public health institutions of Akaki Kality in Addis Ababa, Ethiopia. *Clinics Mother Child Health.* 2019;16(318):2.
 24. Goueslard K, Cottenet J, Roussot A, Clesse C, Sagot P, Quantin C. How did episiotomy rates change from 2007 to 2014? Population-

- based study in France. *BMC Pregnancy Childbirth.* 2018;18(1):1-0.
25. Trinh AT, Khambalia A, Ampt A, Morris JM, Roberts CL. Episiotomy rate in Vietnamese-born women in Australia: support for a change in obstetric practice in Vietnam. *Bulletin of the World Health Organization.* 2013;91:350-6.
26. Baghurst PA, Antoniou G. Risk Models for Benchmarking Severe Perineal Tears during Vaginal Childbirth: a Cross-sectional Study of Public Hospitals in South Australia, 2002–08. *Paediatr Perinat Epidemiol.* 2012;26(5):430-7.
27. Hoque AM, Hoque ME, Van Hal G. Incidence, trends and risk factors for perineal injuries of low-risk pregnant women: experience from a midwife run obstetric unit, South Africa. *Afr J Reprod Health.* 2021;25(4):52-62.
28. O’Kelly SM, Moore ZEH. Antenatal maternal education for improving postnatal perineal healing for women who have birthed in a hospital setting. *Cochrane Database of Systematic Reviews* 2017, (12).
29. Hirayama F, Koyanagi A, Mori R, Zhang J, Souza JP, Gulmezoglu AM. Prevalence and risk factors for third- and fourth degree perineal lacerations during vaginal delivery: A multicounty study.