



RETROSPECTIVE REVIEW OF OBSTETRICS PERINEAL TRAUMA AND ASSOCIATED FACTORS AT THREE HOSPITAL IN ADDIS ABABA, ETHIOPIA

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Abstract

Obstetrics Perineal trauma is any damage to the area between the vagina and the anus during the birth of the baby. It has short and long term complications to the mother. Health care provider has goal to reduce occurrence during process of delivery. Knowing Prevalence, which varies in different part of world due different associated factor, in our community context is one step to solution. This research was done with aim to determine magnitude of obstetric perineal trauma and associated factor in woman who delivered at three hospitals in Addis Ababa, Ethiopia from September, 2018 to August, 2021.

Method: Hospital based comparative cross-sectional study design at three hospitals in Addis Ababa, Ethiopia in retrospective manner. 556 chart were reviewed using systematic random sampling technique. Data analysis done using SPSS version 26 and binary and multivariate logistic regression used to assess relation of perineal trauma and associated factor and P-value < 0.05 was considered as statistically significant.

Result: Out of 556 mothers who deliver during study period, 43% of them had perineal trauma. A mother between 18- 35years of age is less predisposed to perineal trauma with AOR and CI of 0.106 (0.012, 0.934). Having no previous delivery and 01previous delivery were associated to perineal trauma with AOR and CI of 9.091 (4.373, 18.896) and 3.830 (1.749, 8.388) respectively when compared to multiparous mother. In case of mode of delivery, Vacuum with AOR and CI of 6.535 (2.322, 18.392) and forceps with AOR of and CI of 13.509 (3.168, 57.601) are associated to perineal trauma. Duration of second stage greater than 120 minute was associated to perineal trauma with AOR and CI of 4.510 (1.929, 10.546). Labor duration greater than 12 hours is also found to be associated with perineal trauma with AOR and CI of 3.915 (1.813, 8.454). The other factor is related to oxytocin use where Spontaneous labor is found to be associated with perineal trauma having AOR of 2.844 and CI (1.370, 5.904).

Conclusion: this study showed that Age of mother, parity, and mode of delivery, duration of labor, duration of second stage, oxytocin use, and neonatal weight associated with perineal trauma

Introduction

Approximately 140 million births occur globally every year .(1) Vaginal delivery account the highest share as mode of delivery.(2) Time from labor onset to delivery is critical period for the survival of women and their babies, as the risk of morbidity and mortality could increase considerably if complications arise. (1) one of complication associated with child birth is perineal trauma. Obstetrics Perineal trauma is any type of damage to the female genitalia during labour, which can occur spontaneously(due mechanical effect as baby negotiate birth canal) or iatrogenically (via episiotomy or instrumental delivery).(3)

Perineal trauma occurs in up to 84.5 % of vaginal delivery. (4)It has short and long term complications and these include, infection, wound dehiscence, granulation tissue formation, pain, sexual dysfunction as well as urinary and bowel problems, e.g. urinary retention and incontinence and anal incontinence. (4) One of the most distressing immediate complications of perineal injury is perineal pain.(5) It also has negative effect on their psychological and social life which leads to have major impact on planning and accepting next pregnancy.(6)

One of the goals of clinical assistance at spontaneous delivery is to reduce occurrence of maternal trauma.(7) The time of childbirth and the period immediately after are critical for maternal survival and represent an opportunity to increase the return on investments to improve care. Some of risk factor could modifiable if identified earlier and proper intervention was given by provider.(3, 8, 9).

Knowing magnitude and risk factor for perineal trauma helps in our care plan. Based on previous finding, factors associated with obstetric perineal trauma seen not consistence as some factor considered as risk factor at some study while they were considered as protective or no association in another study. For example, one of such factor is Episiotomy and Study done Uganda and Iraq put episiotomy as risk for severe perineal tear while study in Europe country show as protective.(10-12) In another study done in Israel does not show association between episiotomy and severe perineal trauma.(13)In some research ethnicity or nationality was found as risk factor.(14) So, knowing prevalence and risk factor in our context help in training provision in teaching hospital for better care of mother during labor and delivery service. It can be baseline for further research. So the aim of this research was to determine magnitude of obstetrics perineal trauma and associated factor.

Method

Methods and materials

Study setting

This study was conducted at three hospitals in Addis Ababa, Ethiopia. These are Ras Desta Dametew memorial hospital, Dagmawi Minilik comprehensive specialized hospital and Saint Paulos millennium medical college, Addis Ababa, Ethiopia.

St. Paulos Hospitals Millennium Medical College (SPHMMC) is one of tertiary hospital in the Country with academic, research and specialized medical services. The hospital provides delivery service for more than 800 women per month.

Dagmawi Minilik comprehensive specialized hospital is one oldest public hospital in the Ethiopia that was established in 1910. It is located in northeast Addis Ababa in yeka sub city, near to janne meda along Russia road. It serves as referral hospital for different specialization. Its monthly deliver is around 350.

RAS desta dametew memorial hospital is General hospital is situated northeast of Addis Ketema, Along Arbeynoch Street.

Study design and period

Hospital based comparative cross sectional study based on retrospective review of chart of mother delivered from September 2019 to august, 2021.

Source population

The source populations were all mothers who deliver at the three hospitals from September 2018 to August, 2021.

Study Population

All mother deliver vaginally at the three hospitals from September 2018 to August, 2021.

Exclusion and inclusion criteria

Inclusion criteria

All mothers with vaginal delivery, having singleton pregnancy with cephalic presentation and gestational age of more than 28 weeks or greater or 1kg .

Exclusion criteria

The exclusion criteria involve cesarean delivery and incomplete record.

Operational definition

- Perineal trauma is any damage to the area between the vagina and the anus during the birth of the baby.
- First-degree perineal tear – is a laceration of the vaginal mucosa or perineal skin only.
- Second-degree tear – is a laceration involving the perineal muscles.
- A third-degree perineal tear is defined to include injury to the anal sphincter complex and sub classified into
 - 3a [<50% of external anal sphincter (EAS)]
 - 3b (>50%), and
 - 3c [both EAS and internal anal sphincter (IAS)) tears.
- Fourth-degree perineal tears are defined to include injuries to the anal sphincter complex and anal epithelium
- The term third and fourth degree perineal tear can be used or expressed as severe perineal tear or Obstetrics anal sphincter injury (OASIS).
- Macrosomia is defined as newborn weighing greater than 4kg during delivery
- Malposition are all other positions other than occipitoanterior position (occiput posterior, mento-anterior, mentoposterior etc)
- *Malpresentation* are all other presentations other than the vertex (face, breech, brow etc.)
- Instrumental delivery (Operative vaginal delivery) is delivery which assisted by forceps or vacuum.
- Prolonged second stage will be defined as duration of labor longer than 2 hour for woman with previous vaginal delivery and 3hour for woman with no previous delivery
- Episiotomy is a surgical cut made in the perineum during childbirth.

Study variable

Dependent variable

- perineal trauma following vaginal delivery

Independent variable

- parity, maternal age, fetal weight, instrumental delivery, duration of second stage of labour, labor duration, sign of distress, APGAR score, NICU admission, oxytocin use, episiotomy and provider level.

Data collection procedure

Data collection procedure

Data was collected by using a structured checklist about occurrence of perineal trauma with associated factor which have demographic and Obstetric component. And this involves, review of chart of mother, Michu clinic database, Maternity ward, OR, emergency OPD and Labor ward log book. Prior to data collection, collectors were given training on how to collect and organize data for analysis.

For 1st objective the sample size was calculated using a single population proportion formula assuming, prevalence of perineal trauma was 38.8 % which is according to study done Kenya in 2014. (15)Based on record of delivery registration log book on three hospitals the total three deliveries from September, 2018 to august 2021 is more than ten thousand. Using the formula $n = Z^2 p(1-p) / w^2$ making sample size of 360. For 2nd objective, the sample size was calculated using a two population proportion and it was calculated using software based on data from study done at Demberse Markos University, Ethiopia. Among risk factor for severe perineal tear, I used provider level

- Proportion 1: 0.06
- Proportion 2: 0.01
- Significance level :0.05
- Power :90%

Total sample size calculated was 556 .The sample was taken from each hospital dividing into subsets or strata based on the hospital they deliver then, systematic random sampling was used to select individual care take chart for review to be part of study.

Data quality control

Training was given to the data collectors which involve 2 Bsc Midwife and 1 clinical nurse on chart review and reporting based on pre tested data collection checklist. Data were

collected from client chart review using structured data collection list. Supervisor of the research did continuously follow up for overall data collection process. Completeness was ascertained with the collectors. Continuous discussions were made between the investigator and advisors. Codes were given on client chart to avoid repetition.

Data processing and analyzing

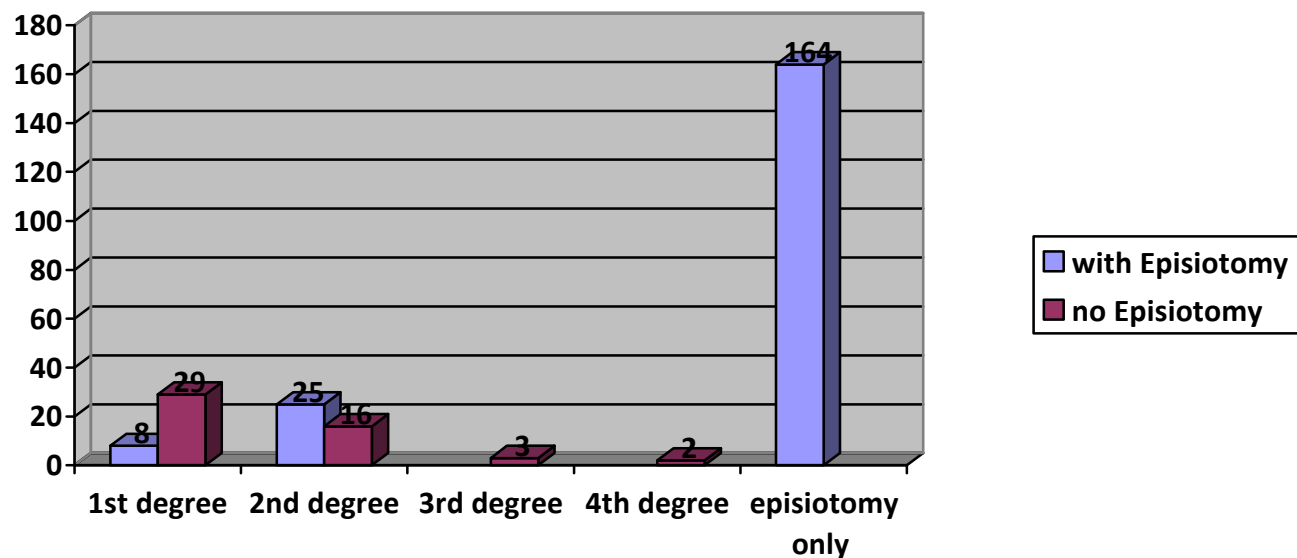
Data were analyzed using SPSS Version 26. Descriptive statistics such as frequency, percentage, mean and standard deviation were used to describe selected variables. Binary and multivariate logistic regression with corresponding 95% confidence intervals (CI) computed to find association between independent and dependent variable. A P-value of < 0.05 was considered statistically significant.

5. Result

A total of 556 chart of mother who delivers from 2018 to 2021 at three hospitals in Addis Ababa, Ethiopia were reviewed. From mother included in the study, half of them delivered at Saint Paulos hospital millennium medical college. 89.6% of mother were between age of 18 to 35 with mean age at time of delivery was and 55.9 % are primiparous who experience delivery first time. 90.8% of mother had known gestational age while 9.2% (51) mother had no known gestational age. 62.2% of labor was with spontaneous onset and progress while 9.5% laboring mothered had required augmentation and 28.2 % of mother were on induction. 48.6% of mother were attended by midwife, 3.6% medical intern and remaining (47.8%) delivery were attended by obstetrics and gynecology resident.

From 556 mother included in study, 43 % of mother had perineal trauma during vaginal delivery. 34% (189) of mother has Episiotomy tear. 14.9 % (83) mother had different degree of perineal tear. 0.9% (5) of mother had obstetric anal sphincter injury (OASI)

Figure 1: Distribution perineal trauma subtype among 556 woman delivered at three hospital in A.A, Ethiopia from 2018-2021



As the figure shows 8 mother with 1st degree perineal tear had episiotomy and 16 mothers with 2nd degree perineal tear had episiotomy and relatively the grade is counted and used for analysis purpose.

Table 3: occurrence of Episiotomy and perineal tear in relation to study variables

		perineal tear				episiotomy	no perineal trauma
		1st degree	2nd degree	3rd degree	4th degree		
Hospital	DMRH	8	11	2	1	41	78
	RDDMH	5	8	0	1	42	78
	SPHMMC	16	22	1	0	81	161
Age group	<18	0	0	1	0	9	1
	18-35	18	27	1	2	148	302
	>35	11	14	1	0	7	14
Gestational age	preterm	1	0	0	0	8	20
	term	25	29	2	2	118	222
	post term	3	12	1	0	21	41
previous delivery	0	17	29	3	2	124	136
	1	8	8	0	0	27	91
	greater than 1	4	4	0	0	13	90
How the labor was initiated and proceeds	Augmentation	0	2	0	0	16	35
	Induction	8	10	0	1	17	121
	Spontaneous	21	29	3	1	131	161
Labor duration	<12hr	12	7	0	0	56	202
	>12h	17	34	3	2	108	115
duration of second stage of labor	<60 minute	15	15	0	0	111	266
	60-119	7	9	1	0	23	38
	> or = 120	7	17	2	2	30	13
mode of delivery	SVD	29	21	2	2	112	303
	Vacuum	0	10	1	0	32	10
	Forceps	0	10	0	0	20	4
sign of distress during labor	No	25	32	1	1	122	289
	Yes	4	9	2	1	42	28
Episiotomy	No	29	16	3	2		317
	Yes	8	25	0	0	164	
who attend the delivery	medical intern	2	2	0	0	5	12
	midwife	18	22	1	2	76	150
	junior resident	8	6	1	0	22	80
	senior resident	1	11	1	0	61	75
1st minute APGAR score	>6	22	29	1	1	142	269
	< or = 6	7	12	2	1	22	48
Neonatal weight	<2500gm	1	0	1	0	10	31
	2500-3900	26	31	2	1	153	283
	> or =4000gm	2	10	0	1	1	3
NICU admission	No	28	32	0	2	157	301
	Yes	1	9	3	0	7	16
		29	41	3	2	164	317

Table 1: Relationship between perineal trauma and study variable

		Perineal trauma		P-value
		Yes	no	
Place of delivery	DMRH	63 (44.68%)	78(55.3%	0.9
	RDDMH	56 (41.79%)	78(58.82%)	
	SPHMMC	120 (42.7%)	161(57.3%)	
Age of mother	<18	10 (90.9%)	1(9.1%)	< 0.01
	18-35	196 (39.36%)	302 9 (60.64%)	
	>35	33 (70.2%)	14 (29.8%)	
Gestational age	<37	20 (69.96%)	9	0.29
	37-41	222 (55.77%)	176	
	> or = 42	41 (52.56%)	37	
Previous delivery	0	136 (43.72%)	175	< 0.01
	1	91 (67.91%)	43	
	>2	90 (81.08%)	21	
Who attend delivery	Medical intern	12(60%)	8(40%)	0.027
	midwife	150(55.56%)	120(44.44%)	
	Junior resident	80(68.37%)	37(31.62%)	
	Senior resident	75(50.33%)	74(49.60%)	
Mode of delivery	SVD	166(35.39%)	303 (64.60%)	< 0.01
	Vacuum	43(100%)		
	Forceps	30(88.23%)	4(11.76%)	
Episiotomy	Yes	189(100%)	0	< 0.01
	No	50(13.62%)	317 (86.37%)	
Duration second stage	<60 minute	141(34.64%)	266 (65.35%)	< 0.01
	60-119	40(51.28%)	38 (48.71%)	
	> or =120	58(81.69%)	13(18.30%)	
Duration of labor	<12hr	75(27.03%)	202(72.09%)	< 0.01
	>12hr	164(58.78%)	115(41.21%)	
Neonatal weight	<2.5	12(27.07%)	31(72.92%)	< 0.01
	2.5-3.9	213 (42.94%)	283 (57.05%)	
	>or = 4	14 (82.35%)	3 (17.64%)	
How labor onset and proceed	Spontaneous	185 (53.46%)	161(46.53%)	< 0.01
	Induction	36(22.92%)	121(77.07%)	
	augmentation	18 (33.96%)	35(66.03%)	
Sign of distress during labor	Yes	20(55.55%)	16(44.44%)	< 0.01
	No	219 (42.11%)	301(57.88%)	
APGAR score	< or = 6	44(47.8%)	48(52.17%)	0.022
	> 6	195(42.02%)	269(57.97%)	
NICU admission	Yes	58(67.44%)	28(32.55%)	0.121
	No	181(38.5%)	289(61.49%)	

Table 1: Logistic regression of total perineal trauma with associated factor

		Crude Odd ratio	Adjusted Odd ratio
Age of mother	<18		
	18-35	.275(0.144-0.528)*	0.106(0.012-0.934)*
	>35(R)		
Previous delivery	0	5.515(3.262-9.324)*	9.091(4.373-18.896)*
	1	2.025(1.114-3.681)*	3.830(1.749-8.388)*
	>2 (R)		
Who attend delivery	Medical intern (R)		
	midwife	1.200(0.475-3.030)	1.210(0.414-3.538)
	Junior resident	0.694(.261-1.841)	0.424(0.134-1.344)
	Senior resident	1.480(.572-3.829)	0.73(0.230-2.332)
Mode of delivery	SVD (R)		
	Vacuum	7.849(3.845-16.023)	6.535(2.322-18.392)
	Forceps	13.690(4.741-39.526)	13.509(3.168-57.601)
Duration second stage	<60 minute (R)		
	60-119	1.986(1.218-3.237)*	1.416(0.772-2.598)
	➤ or =120	8.417(4.460-15.885)*	4.510(1.929-10.546)*
Duration of labor	<12hr (R)		
	>12h	3.841(2.689-5.486)*	2.910(1.792-4.726)*
Neonatal weight	<2.5 (R)		
	2.5-3.9		3.072(1.262-7.480)*
	>or = 4	12.056(2.932-49.569)*	47.480(5.166-436.397)*
How labor onset and proceed	Spontaneous	2.234(1.218-4.098)*	2.844(1.370-5.904)*
	Induction		
	augmentation(R)		
APGAR score	0	0.070(0.009-0.563)*	
	1-6 (R)		
	>6	0.607(0.376-0.980)*	

*** p-value is <0.05**

No significant association was found between the development of perineal trauma with place of delivery and gestational age

6. Discussion

This research was intended to show magnitude of perineal trauma and associated factor.

43% of mother who deliver in study period had perineal trauma during delivery. it was comparable with study done in Iraq which showed prevalence of perineal trauma to be 47%.(12) it was found to be low in magnitude when compare to review and meta-analysis made from countries with low and middle economical level country and study done Iran which was had incidence of perineal trauma 81.4%.(14, 16)In comparison to study done in Africa, it was slightly higher than study done in Ethiopia at ATAT hospital located Gurage zone of south nation nationality region and Kenya which was 38.4 and 38.8% respectively.(17, 18) and our finding was 7.5 times higher than study done Guniea where magnitude perineal trauma was 5.7%.(17).0.9% mother has severe degree perineal trauma.

34% of mother had Episiotomy which was lower than two studies done in 2016,the first studies done by Tobiaaw T. and other by Tamene B, at one of current study area which is Saint Paulos hospital millennium college that show prevalence of Episiotomy to be 65.4% and 41.9% respectively . It also lower than study done other area or hospitals like Tikur anabessa specialized teaching hospital in Addis ABABA 40.2%, Feleghiwot hospital in Bahir dar 41.1%, Metema district 44.15%,Axum Town of Tigray region of north Ethiopia41.44%, South-East Nigeria 62.1%.(19-24).It is comparable from study finding in Shirie town of Tigray region of Ethiopia and Ogbomoso city of south western Nigeria(25, 26)

Age group between 18- 35 has less chance of having perineal trauma when compared to teenage and those deliver at older age .Study done Washington has similar finding where Rate of perineal trauma increased with maternal age. But this study also show opposite finding in relation to young age, where it showed less perineal laceration including episiotomy in adolescent (36). Risk of perineal trauma due episiotomy was high in our study in young age which might be related to use elective episiotomy with consideration inadequate pelvis for delivery in this age group. In Study done in South Africa, Iran and Mexico shows that young ages were being more associated with perineal trauma.(14, 27, 28)

Those with no previous delivery and 01previous delivery has 9.091 times and 3.830 times risk of perineal trauma with confidence interval of (4.373-18.896) and (1.749-8.388) respectively compared to mother who had more 01 previous delivery. Similar result was seen in study done in Brazil, and Iran where, primiparous found to be a risk for perineal trauma.(14, 29)

In multivariate analysis, perineal trauma was strongly associated with Instrumental delivery. Vacuum with odd ratio 6.535(2.322, 18.392) and forceps odd ratio13.509 (3.168, 57.601). The perineal trauma was found to be more associated with forceps delivery. Similar

finding was seen study done in Brazil and south East England where instrumental delivery was strongly associated with perineal trauma. When comparing vacuum with forceps, Vacuum extraction delivery seems to lead to less perineal trauma than forceps delivery (29, 30)

Those mothers, whose duration of second stage of labor was greater than two hour, were associated with perineal trauma with odd ratio and confidence interval 4.510(1.929,10.546). These finding was also seen in South East England and Iran study.(14, 30)

Our study found that an Labor duration greater than 12 hours associated with perineal trauma with odd ratio and confidence interval of 3.915(1.813,8.454). There was similar finding that show duration of labor has been significantly associated with perineal trauma and in that study done in South Africa the effect was seen with active stage of labour of >6hour.(17)

Neonatal weight at time of delivery being greater than 4000gm associated with perineal trauma with odd ratio of 3.072 and confidence interval (1.262,7.480) while those less than 2500 gram were found to be more protective .Study done in our country Ethiopia, Sweden, South East England and in USA at New Mexico, Maryland and Washington study also show similar finding with heavier neonatal weight risk for perineal trauma(13, 30-33)

Mother with spontaneous labor found to have associated with perineal trauma than induction group. This is opposite finding from previous studies where finding shows that, use of oxytocin in labor increased the chances of perineal trauma (14, 34).This finding might be related to follow and attentions given during labor follow up.

There are limitations seen in these studies. The first one, Analysis for severe perineal trauma was not done as few cases was found which cannot enough for analysis and also make conclusion. Since the research was based on chart review in retrospective manner, some factor like obesity, fetal head circumference, maternal position, pelvic support , fundal pressure were not studied due lack of documentation.

Conclusion: In this study perineal trauma was high .This mainly related to routine practice of episiotomy. Factor like Age of mother, parity, and mode of delivery, duration of labor, and duration of second stage, oxytocin use, and neonatal weight were found associated with perineal trauma.

Recommendation

Based on this study finding,

- We should improve our labor follow up specifically for the mother with spontaneous labor.
- We should do Episiotomy only if we anticipate possible tear and we should avoid routine episiotomy practice.
- Documentation in patient chart , HMIS log book should improve and should have complete information
- The institution should encourage those individual who diagnosis, report and properly managed perineal trauma specifically third and fourth degree perineal trauma which are one of quality indicator obstetrics service. By doing such, more case will be properly managed without fear of litigation.

Ethical considerations

This study was approved by the institutional review board and department of OBGYN of SPHMMC before data collection process. Privacy and confidentiality of study participants was ensured throughout the study. The information of the client was used for this study only and code was used for confidentiality.

Sources of Funding

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Annex

Data collection tool for chart review

1. Age of mother: _____
2. Parity of mother: _____
3. Does the gestation age of pregnancy was known
 - A) Known
 - B) Unknown
4. For question 3: If known , mention the gestational age: _____
5. For question 3: if unknown , mention the duration of amenorrhea in month: _____
6. Duration of labor in hour : _____
7. Duration of second stage in minute: _____
8. neonatal weight at delivery in Kg: _____
9. Does the fetus showed sign of fetal distress or non-reassuring fetal during labor
 - A) Yes
 - B) No
10. APGAR score on delivery at 1st and 5th : _____
11. A need for Neonatal admission: _____
12. Mode of delivery
 - A) Spontaneous vaginal delivery
 - B) Instrumental delivery
13. If instrumental delivery, which type
 - A) Forceps
 - a. Mid
 - b. Low
 - c. outlet

14. Vacuum

- a. Mid b. Low c. outlet

15. Indication for instrumental

delivery:_____

16. Who attend the delivery

- a. Medical intern b. midwife c. year 1 resident d. year 2 resident
e. year 3 resident f. year four resident

17. Did the mother have Episiotomy tear?

- a. Yes b. no

18. If yes for question 6, mention the type

- A) Mediolateral B) Midline C) Not mentioned

19. did mother had Obstetric perineal trauma

A) Yes

B) No

Question no 20 to 27 are based on question 19

20. mention degree

- a. 1st degree b. 2nd degree c. 3rd degree d. 4th degree

21. Was it repaired

- a. Yes b. No

22. Type of suturing material used for repair

- A. Vicryl B. catgut C. not repaired

23. Where was it repaired

- a. Delivery room b. OR

24. Who repaired the tear

- A. Medical intern B. Midwife C. Junior Resident D. Senior resident
E. Consultant

25. Antibiotic given

- a. IV antibiotic b. PO antibiotic C. not given

26. Who repaired the tear

- a. Medical intern b. midwife c. year 1 resident d. year 2 resident
e. year 3 resident f. year four resident g. consultant

27. Type of analgesia / anesthesia used for repair : _____

28. Who attend the delivery

- b. Medical intern b. midwife c. year 1 resident d. year 2 resident
e. year 3 resident f. year four resident

29. How the labor was initiated and proceeds?

- A. Spontaneously B. induced C. on Augmentation