Prevalence and Associated Factors of Hemorrhoids and Other Perianal Complications During the Puerperium Among Mothers Who Gave Birth at Debre Tabor Referral Hospital, Debre Tabor, Ethiopia, 2022

Anemut Tilahun[1], Awgchew Behaile Teklemaryam[1], Zelalem Tilahun[2], Nega Dagnew Baye[1], Alebachew Amsalu[1], Birhanu Mengist[1], Mezgebu Legesse[3], Abebe Muche Belete[4], Melaku Mekonnen Adidew[1]

1 Debre Tabor University
2 Addis Ababa University
3 Haramaya University
4 Debre Birhan University

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Abstract

Puerperium is defined as the period of six weeks after childbirth during which the mother's reproductive organs return to their original non-pregnant condition. Perianal problems, including constipation, hemorrhoids, and fissures, are among the most common complications among women during the puerperium, observed in about 30 to 50 percent of women. Considering this great prevalence and the paucity of similar research in Ethiopia, this study was done to assess the prevalence of perianal problems during the puerperium and the risk factors associated with them.

Methods: An institution-based cross-sectional study was conducted from February 1 to April 30, 2022. Quota sampling technique was used to select a total of 191 participants. The data were collected and then entered using EPI DATA version 3.1 and exported to STATA 14 for analysis. Bivariable and multivariable logistic regression analyses were performed. Adjusted odds ratio (AOR) with 95% confidence interval was used as a measure of association. Variables having a P-value < 0.05 from the multivariable analysis were considered to have a significant association with the outcome.

Results: The total prevalence of all the perianal problems in the puerperium encountered in this study was 22.5% (43 mothers). The perianal problems encountered were fissure [9.4%], followed by hemorrhoids [7.3%], peri-anal episiotomy infections (4.2%), and peri-anal tears (1.6%).

Comparative analysis showed that positive family history, past history of perianal diseases, and prolonged second stage of labor (>50 minutes) showed a higher prevalence in the perianal disease group as compared to the healthy group. A statistically significant relationship was observed between the prevalence of hemorrhoids and a past history of any perianal disease [p=0.04]. A statistically significant relationship was observed between the prevalence of hemorrhoids and parity [p=0.02]. There was also a statistically significant relationship between constipation during

pregnancy and the development of hemorrhoids [p=0.01].

Conclusion: Anal fissure, hemorrhoids, and perianal episiotomy infections are the most common perianal problems in the postpartum period, causing a significant reduction in the quality of life of those afflicted with them.

Anemut Tilahun Mulu[1], **Awgchew Behaile Teklemariyam**[1], **Zelalem Tilahun**[1], **Nega Dagnew**[1], **Alebachew Amsalu**[2], **Birhanu Mengist**[3], **Mezgebu Legesse**[4], **Abebe Muche Belete**[5], **Melaku Mekonnen Agidew**[1]

[1] *Department of Biomedical Sciences, College of Health Sciences, Debre Tabor University, Debre Tabor, Ethiopia*

[2] *Department of Public Health, College of Health Sciences, Debre Tabor University, Debre Tabor, Ethiopia*

[3] *Department of Psychiatry, College of Health Sciences, Debre Tabor University, Debre Tabor, Ethiopia*

[4] *Department of Biochemistry, College of Health Sciences, Haramaya University, Harar, Ethiopia*

[5] *Department of Biochemistry, College of Health Sciences, Debre Birhan University, Debre Birhan, Ethiopia*

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1. Introduction

Puerperium is an extremely important period of time for a woman. Extensive physiological, biochemical, and dietary changes occur during pregnancy and puerperium[1]. The body secretes a large amount of progesterone, which causes decreased muscle tone and lower motility of the gastrointestinal tract[2]. About 1/3rd of women after childbirth complain of perianal symptoms. Patients in puerperium show a significant increase in the incidence of peri-anal symptoms compared to the normal population[3]. Perianal problems, including constipation, hemorrhoids, and fissures, are among the most common digestive complications among women in the puerperium. Due to the recurring physical and psychological problems they cause for the patient, these disorders can cause a significant reduction in the life quality of those afflicted with them[4].

Hemorrhoids are the anastomoses between the superior rectal artery and the superior, middle, and inferior rectal veins that surround the distal rectum and anal canal. They are a distal displacement and venous distention of the hemorrhoidal cushions [5]. Based on location, hemorrhoids are usually classified as internal and external hemorrhoids. Internal hemorrhoids arise above the dentate line and are covered by columnar epithelium, while external hemorrhoids arise below the dentate line and are covered by squamous epithelium [6]. Patients with hemorrhoids are usually asymptomatic, but the common symptoms are bleeding with or without defecation, swelling, mild discomfort or irritation, and pruritus ani. Though some patients need to undergo surgery, many hemorrhoid patients can successfully be treated with conservative medication and ointments[7]. The pathogenesis of hemorrhoids is that a weakening of the anal cushion leads to descent or prolapse of the hemorrhoids and spasm of the internal sphincter[8]. Studies conducted elsewhere indicated that

inadequate dietary fiber, constipation, diarrhea, hypertension, high body mass index (BMI), pregnancy, and old age are the commonly identified risk factors for the development of hemorrhoids[9].

Considering the great prevalence of perianal problems during the puerperium and the paucity of similar research conducted in Ethiopia, we aim to assess the prevalence of various perianal problems seen in women during their puerperal period and the risk factors associated with them.

2. Methodology

2.1. Study Area and Period

An institution-based cross-sectional study design was conducted from February 1 to April 2022 G.C. among mothers who gave birth in Debre Tabor Specialized Hospital. The hospital was founded in 1934, and it is located in the South Gondar administrative zone, Amhara National Regional State, which is about 667 km northwest of Addis Ababa (the capital city of Ethiopia). According to the 2015 population projection of major cities in Ethiopia, the total population of Debre Tabor town was estimated to be 119,176. Currently, Debre Tabor town has one Referral Hospital and three government health centers. Debre Tabor Hospital is a specialized referral hospital that serves more than three million people in the South Gondar zone and people in neighboring zones.

Population and Sample Size Determination

The source population of the study was all pregnant women in Debre Tabor town in the year 2022. The study population was all mothers giving birth during the time of data collection at Debre Tabor Specialized Hospital. Mothers who were unable to communicate and severely ill were excluded from the study. The sample size was determined using a single population proportion formula by using a 95% confidence interval, 0.05 margin of error, 10% non-response rate, and a p-value of 0.13 (13% prevalence of hemorrhoids in adult patients visiting the surgical OPD of Gondar Specialized Hospital). Therefore, the final sample size was 191, and participants were selected using the quota sampling technique.

Variables and Data Collection Procedures

The main outcome variables of this study were perianal problems. Patients were diagnosed based on history and anorectal examination, which includes inspection, digital examination, and anoscopy. The first group of factors assessed was socio-demographic characteristics, including age, residence, educational status, occupation, and average monthly income. The second was clinical factors, which included a family history of hemorrhoids and a history of constipation during pregnancy. The third group of characteristics assessed was behavioral and obstetric factors, mainly focused on mode of delivery, parity, length of 2^{nd} stage of labor, previous history of perianal disease, and baby body weight. Constipation means unsatisfactory defecation characterized by infrequent stool, difficulty in defecation, or both, at least for the previous 3 months[10].

2.6. Data Processing and Analysis

Each questionnaire was checked visually for completeness. Data were coded and entered using EPI DATA 3.1 version and exported to the STATA 14 for analysis. Data cleaning was done by identifying and correcting missed values and inconsistencies. Descriptive statistics like frequency and percentage was done to describe the study population in relation to different variables. The binary logistic regression model was used as a primary method of analysis. Variables having p-value < 0.025 from the bivariable analysis
were chosen as a candidate for the final multivariable logistic regression model and variables having p-value <0.05 were considered to have a significant association with the outcome variable. An adjusted odds ratio with 95% CI was used as a measure of association.

2.7. Ethical Approval

The study was approved by the ethical review committee of health science college, Debre Tabor University. Verbal informed consent was taken from all mothers enrolled in the study. written informed consent was not taken, since most of the participants were unable to read and write. The verbal consent was taken after a brief description about the main aim of the research.

3. Results

3.1. Socio-demographic and clinical Characteristics of Study Participants

More than half (53.4%) of mothers live in rural setting, 48.7% of mothers are in the age range of 15-29 and 44.5% of mothers are farmers. Most of mothers (96.9 %) are followers of Orthodox and 39.3% of mothers are uneducated.

Table 1. Socio-demographic characteristics of mothers who gave birth in Debre Tabor specialized Hospital, Ethiopia, 2021 (n = 191).

Variable	Frequency	Percentage
Age		
15-29	93	48.7
30-39	84	44.0
40-49	14	7.3
Residence		
Urban	102	53.4
Rural	89	46.6
Occupation		
Farmer	85	44.5
Merchant	12	6.3
Civil servant	51	26.7
Housewife	15	7.8
Student	4	2.1
Daily laborer	15	7.8
Others	9	4.7
Religion		
Orthodox	185	96.9
Muslim	4	2.1
Protestant	2	1
Educational status		
No formal education	75	39.3
Primary education	22	11.5
Secondary education	26	13.6
College or above	68	35.6

3.2. Clinical characteristics of study participants

The total prevalence of all perianal problems in puerperium was 43[22.5%]. The perianal problems encountered were fissure [9.4%] followed by hemorrhoids [7.3%], peri-anal episiotomy infections (4.2%), and peri-anal tears (1.6%).

Table 2. Prevalence of perianal problems during puerperium in the study area

Perianal problem	Frequency	Percentage [%]
Hemorrhoids	14	7.3
Fissure	18	9.4
Peri-anal episiotomy infections	8	4.2
Perineal tear	3	1.6
None	148	77.5

By comparative analysis of suspected risk factors for perianal diseases in the puerperium, it was found that a positive family history, macrosomia, past history of perianal diseases, and prolonged second stage of labor (>50 minutes) showed a higher prevalence in the perianal disease group as compared to the healthy group, of which a positive family history of perianal diseases [p=0.035] and past history of perianal diseases [p=0.012] were the risk factors that were statistically significant, as seen in Table 3.

Table 3. Risk Factors for Perianal Problems During Puerperium

Risk Factor	Peri-anal Diseases Group, n [%]	Healthy Group, n [%]	Odds Ratio [95% CI]	P-value
Age > 30 years	13[13.3%]	85 [86.7%]	0.576	0.285
Positive family history	21 [55.3%]	17 [44.7%]	1.665	0.035
Macrosomia	17 [56.7%]	13 [43.3%]	1.070	0.892
Vaginal delivery	27 [24.3%]	84 [75.7%]	1.561	0.128
Caesarean section	16 [20%]	64 [80%]	1.484	0.128
Past history of peri- anal diseases	31 [57.4%]	23 [42.6%]	1.258	0.012
Second stage of labor >50mins	29 [55.7%]	23 [44.3%]	1.361	0.125

A statistically significant relationship was observed between the prevalence of hemorrhoids and parity [p=0.02] and past history of any anorectal disorders (p=0.04). Mothers with constipation in pregnancy have a higher chance of hemorrhoids in pregnancy. This was statistically significant [p=0.01]. There was no significant statistical relationship between the prevalence of hemorrhoids and the type of current mode of delivery or a family history of any anorectal disorders, prolonged length of the second stage of labor, or the presence of hemorrhoids during the puerperium.

Table 4. Relationship between significant risk factors and hemorrhoids during puerperium

Risk factor	Hemorrhoids		P value
Parity	Positive	Negative	
Primipara	5(5.9%)	79 (94.1%)	0.02
Multipara	9(8.4%)	98 (91.6%)	
Risk Factor	Hemorrhoid	P- value	
Past history	Positive	Negative	
Present	9 (8.65%)	95 (91.35%)	0.04
Absent	5 (5.75%)	82(94.25%)	
Risk Factor	Hemorrhoid	P value	
Hx of constipation	Positive	Negative	
Present	10 [9.2%]	99 [90.8%]	0.01
Absent	4 [4.9%]	78 [95.1%]	

4. Discussion

In this study, the prevalence of hemorrhoids in puerperal subjects is 7.3%. This finding was in agreement with studies done by Poskus *et al*[1], Rabindranath and Rahul[3], Sheikh *et al*[8], and Kibret *et al*[11]. Most of these studies were believed to be overestimated; this can be attributed to the fact that many studies had an anal examination done during pregnancy.

We have found that with increasing parity, the likelihood of developing hemorrhoids is high. This was similar to findings from Martinez *et al*[2], Gardner *et al*[6] and Zhang *et al*[10]. This increment in hemorrhoid risk with increased parity might be attributed to the repeated change in the environment and emotional stress on repeated pregnancies causing constipation and further hemorrhoids in subsequent pregnancies[2]. It can also be attributed to increased vascular growth factors in consequent pregnancies[12].

In this study, we found that a past history of perianal problems was found to increase the risk of hemorrhoids in pregnancy and puerperium, which was also seen in studies done by Zagriadskii *et al*[9], Martinez *et al*[2], Rampal *et al*[7], and Kibret *et al*[11]. This could be attributed to the increase in hemorrhoidal symptoms as pregnancy progresses, since circulating blood volume reportedly increases by 25-40%[9]. This leads to increased vascular engorgement and dilatation, with venous stasis increased by the enlarging gravid uterus or increased pelvic floor laxity[6].

Mothers with a history of constipation during pregnancy were more likely to develop hemorrhoids as compared to those who did not have constipation during their pregnancy. This was in line with findings by Zhang *et al*[10], Oumar *et al*[5] and Godeberge *et al*[9]. This might be due to intensive straining during defecation, impairment of defecation habits during pregnancy, decrease in physical activity, compression of the lower bowel by the uterus, and psycho-social stress[10]. It might also be due to pregnancy-induced increment in intraabdominal pressure, which leads to vascular engorgement [13].

We found that mothers who gave birth to heavier babies [>4000 grams] were associated with the development of anal fissures during the puerperium. This was in agreement with findings from Oumar *et al*[5], Zhang *et al*[10] and Beksac *et al*[4]. This might be due to decreased blood flow in the anal mucosa due to a heavier baby in pregnancy, which in turn causes higher chances of fissure in the puerperium[14]. Heavier babies can cause increased perineal tears, causing higher chances of developing fissures[9].

5. Conclusion

We found a slightly higher prevalence of hemorrhoids among mothers during the puerperium period. This was the first study conducted as far as our search is concerned. Past history of perianal diseases, history of constipation during pregnancy, and increased parity were found to be independent risk factors for perianal disease during the puerperium. Multiparous mothers and patients with past history of perianal diseases have a higher prevalence of hemorrhoids in the puerperium. Mothers with prolonged second stage of labor and macrosomic babies are more likely to develop hemorrhoids during the puerperium.

Hemorrhoids and other perianal problems that occur during the puerperium can cause intensive physical and psychological issues in mothers, which can directly deteriorate the quality of life of mothers. The elimination of these risk factors may lead to a higher quality of life during pregnancy and the puerperium.

6. Recommendation

Local health care facilities and international NGOs working on women's affairs should focus on minimizing the risk factors of hemorrhoids and other perianal problems.

Mothers should have been advised on the control and prevention mechanisms of constipation and hemorrhoids during their ANC follow-up and other medical visits during pregnancy.

A large-scale and holistic study should be conducted on the prevalence, determinants, and causes of perianal problems encountered during the puerperal period.

Abbreviations

- NGOs- Non-governmental Organization
- OPD- Out Patient Department
- SPSS- Statistical Package for the Social Sciences
- WHO- World Health Organization

Statements and Declarations

Data Availability

The SPSS data used to support the findings of this study is available from the corresponding author upon request.

Ethical Approval

Ethical approval was obtained from Debre Tabor University Ethical Review Board, and a letter of permission to conduct the study was obtained from Debre Tabor Hospital clinical director's office.

Conflict of Interest

The authors declare that they have no competing interests.

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References

1. [a, b] *Poskus T, Sabonyte-Balsaitiene Z, Jakubauskiene L, Jakubauskas M, Stundiene I, Barkauskaite G, et al. Preventing hemorrhoids during pregnancy: a multicenter, randomized clinical trial. BMC Pregnancy Childbirth. 2022 Dec 1;22(1).*
2. [a, b, c, d] *Martínez-Galiano JM, Hernández-Martínez A, Rodríguez-Almagro J, Delgado-Rodríguez M, Gómez-Salgado J. Relationship between parity and the problems that appear in the postpartum period. Sci Rep. 2019 Dec 1;9(1).*
3. [a, b] *Ravindranath GG, Rahul BG. Prevalence and risk factors of hemorrhoids: a study in a semi-urban centre. Int Surg J. 2018 Jan 25;5(2):496.*
4. [a, b] *Beksac K, Aydin E, Uzelpasacı E, Akbayrak T, Ozyuncu O. Hemorrhoids and related complications in primigravid pregnancy. J Coloproctology. 2018 Jul 1;38(3):179–82.*
5. [a, b, c] *Oumar T, Diarra AS, Tembiné K, Cissé K, Keita S, Touré S, et al. Epidemiological and clinical profile of primary anal fissures in the hospital of Sikasso. PAMJ Clin Med. 2022;10.*
6. [a, b, c] *Gardner IH, Siddharthan R V., Tsikitis VL. Benign anorectal disease: Hemorrhoids, fissures, and fistulas. Vol. 33, Annals of Gastroenterology. Hellenic Society of Gastroenterology; 2020. p. 9–18.*

7. [a, b]*Hong YS, Jung KU, Rampal S, Zhao D, Guallar E, Ryu S, et al. Risk factors for hemorrhoidal disease among healthy young and middle-aged Korean adults. Sci Rep. 2022 Dec 1;12(1).*
8. [a, b]*Sheikh P, Régnier C, Goron F, Salmat G. The prevalence, characteristics and treatment of hemorrhoidal disease: Results of an international web-based survey. J Comp Eff Res. 2020 Dec 1;9(17):1219–32.*
9. [a, b, c, d, e]*Godeberge P, Sheikh P, Zagriadskiĭ E, Lohsiriwat V, Montaño AJ, Košorok P, et al. Hemorrhoidal disease and chronic venous insufficiency: Concomitance or coincidence; results of the CHORUS study (Chronic venous and HemORrhoidal diseases evalUation and Scientific research). J Gastroenterol Hepatol. 2020 Apr 1;35(4):577–85.*
10. [a, b, c, d, e]*Shi W, Xu X, Zhang Y, Guo S, Wang J, Wang J. Epidemiology and risk factors of functional constipation in pregnant women. PLoS One. 2015 Jul 24;10(7).*
11. [a, b]*Kibret AA, Oumer M, Moges AM. Prevalence and associated factors of hemorrhoids among adult patients visiting the surgical outpatient department in the University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia. PLoS One. 2021 Apr 1;16(4 April).*
12. [^]*De Marco S, Tiso D. Lifestyle and Risk Factors in Hemorrhoidal Disease. Vol. 8, Frontiers in Surgery. Frontiers Media S.A.; 2021.*
13. [^]*Staroselsky A, Nava-Ocampo AA, Vohra S, Koren G. Motherisk Update Current Practice • Pratique courante Hemorrhoids in pregnancy [Internet]. Vol. 54. Available from: www.cfpc.ca*
14. [^]*Hong J, Kim I, Song J, Ahn BK. Socio-demographic factors and lifestyle associated with symptomatic hemorrhoids: Big data analysis using the National Health insurance Service-National Health screening cohort (NHIS-HEALS) database in Korea. Asian J Surg. 2022 Jan 1;45(1):353–9.*