European Journal of Clinical Pharmacy
Print ISSN: 2385-409X, **Online ISSN**: 3105-0409
Website: https://farmclin.com/

Comparative Effectiveness of Tranexamic Acid Vs NSAIDS in Management of Heavy Menstrual Bleeding in Reproductive-Age Women.

Article History:

Name of Author:
Nayyer Latif [1],Rubina Baber [2],Uzma Zaman [3]

Affiliation: *[1]Assistant Professor Department of Obstetrics and Gynecology Gomal Medical College,Dera Ismail Khan*
[2]Assistant Professor Department of Obstetrics and Gynecology Gomal Medical College,Dera Ismail Khan
[3]Assistant Professor Department of Obstetrics and Gynecology Gomal Medical College,Dera Ismail Khan

Corresponding Author:
Dr. Uzma Zaman
Email: uzmamoiz786@gmail.com

Received: 12-10-2025
Revised: 16-10-2025
Accepted: 29-10-2025
Published: 10-11-2025

Abstract: Background: Heavy menstrual bleeding (HMB) is a common gynecological condition among women of reproductive age and is frequently associated with anemia and reduced quality of life. Non-hormonal therapies, including tranexamic acid and nonsteroidal anti-inflammatory drugs (NSAIDs), are widely used; however, their comparative efficacy remains a subject of clinical interest.**Objective**: To compare the efficacy of tranexamic acid and NSAIDs in reducing menstrual blood loss and improving clinical outcomes among women with HMB.**Methodology:** 100 women diagnosed with HMB. Participants were allocated into two treatment groups: Group A received tranexamic acid 1 g three times daily, while Group B received mefenamic acid 500 mg three times daily for three consecutive menstrual cycles. Menstrual blood loss was assessed using the Pictorial Blood Loss Assessment Chart (PBAC), and hemoglobin levels were measured before and after treatment. Data were analyzed using SPSS version 25, with $p < 0.05$ considered statistically significant.**Results:** The mean age of participants was 32.4 ± 5.8 years in the tranexamic acid group and 31.9 ± 6.1 years in the NSAID group ($p = 0.68$). Baseline PBAC scores were comparable between groups ($p = 0.47$). Following treatment, PBAC scores decreased significantly in the tranexamic acid group (145 ± 30) compared with the NSAID group (198 ± 35) ($p < 0.001$). Improvement in hemoglobin levels was significantly greater in the tranexamic acid group ($p = 0.002$). Conversely, NSAIDs provided superior relief of dysmenorrhea ($p = 0.01$). Both treatment modalities were well tolerated.**Conclusion:** Tranexamic acid demonstrated superior efficacy over NSAIDs in reducing menstrual blood loss and improving hemoglobin levels in women with HMB, whereas NSAIDs were more effective for pain relief. Treatment selection should be individualized according to the patient's predominant symptoms and clinical needs.

Keywords: Heavy menstrual bleeding; Tranexamic acid; Nonsteroidal anti-inflammatory drugs; Pictorial Blood Loss Assessment Chart; Menorrhagia

INTRODUCTION

Heavy menstrual bleeding (HMB) is a common gynecological disorder in women of childbearing age and is characterized by excessive loss of menstrual bleeding that disrupts the physical, emotional, social, and material quality of life of a woman. It represents a large percentage of outpatient gynecology visits in the world. The condition is often associated with iron

deficiency anemia, fatigue, and decreased productivity, especially in low-resource settings where delayed presentation is common [1,2]. HMB is multifactorial in etiology, both in structural (fibroids and polyps) and non-structural (coagulopathies, ovulatory dysfunction, and endometrial disorders) causes. A standard method of identifying underlying causes is offered by the International Federation of Gynecology and Obstetrics (FIGO) classification system (PALM-COEIN). Nevertheless, empirical management of medical care is commonly started in most clinical situations, particularly in resource-constrained and limited settings, even before much investigation is conducted [3,4]. Treatment of HMB is based on the symptom severity, etiology, patient preferences, and fertility. Non-hormonal medical interventions are usually employed as a first-line treatment in women who are interested in fertility or do not want to experience hormonal side effects. Two of these, tranexamic acid (TXA) and nonsteroidal anti-inflammatory drugs (NSAIDs), are highly recommended because of their effectiveness, availability, and cost-efficiency [5,6]. Tranexamic acid is an antifibrinolytic agent that acts by blocking plasminogen activation, thus stabilizing fibrin clots and lowering menstrual blood loss. In different clinical trials, it has been found to minimize menstrual bleeding by up to 50%. NSAIDs, on the other hand, like mefenamic acid, decrease the production of prostaglandins and hence cause a decrease in uterine contractions and vasodilation. They are especially useful in women who have dysmenorrhea that is related, but their impact on lessening blood loss is relatively limited [7,8]. Although both treatment methods are available, direct comparative studies are still required to establish the relative effectiveness of both in real-life clinical practices. Although past study implies that TXA is better at decreasing menstrual blood loss, NSAIDs can be used to provide extra advantages in pain management. Nonetheless, the differences in outcome measures, study populations, and methodologies have resulted in different conclusions [9].In the developing world, such as in Pakistan, where access to advanced therapies may be scarce, it is important to maximize the use of more affordable and more easily accessible medications. Awareness of the comparative effectiveness of TXA and NSAIDs would enable clinicians to make evidence-based decisions to suit patient needs. Thus, the present study will assess and compare the effectiveness of tranexamic acid and NSAIDs in the treatment of heavy menstrual bleeding in reproductive-age women [10].

CASE PRESENTATION

Study Design & Setting

The study was a retrospective study carried out in the Department of Obstetrics and Gynecology Gomal Medical College,Dera Ismail Khan from 05 January 2024 05 june 2024 during a period of six months, which offered standardized assessment and treatment of patients with heavy menstrual bleeding.

Participants

One hundred reproductive-age women (18 to 45 years) who were referred with heavy menstrual bleeding were recruited. Outpatient clinics were used to recruit patients. Individuals who met the eligibility criterion were selected in two groups randomly, with an equal number in each. All participants were informed and provided informed consent before inclusion to guarantee that there was voluntary participation and confidentiality of clinical information.

Sample Size Calculation

The sample size of 100 patients (50 in each group) was based on a confidence level of 95, a power of 80, and the anticipated difference in reduction of menstrual blood loss among groups using past study. The margin of error was taken to be 5%, which included the possibility of dropouts.

Inclusion Criteria

- Women aged 18–45 years
- Diagnosed with heavy menstrual bleeding (PBAC score >100)
- Regular menstrual cycles
- Ready to play and consent.

Exclusion Criteria

- Pregnancy or lactation
- Known bleeding disorders
- Uterine malignancy
- Use of hormonal therapy in the last 3 months
- Severe systemic illness

Diagnostic and Management Strategy

Clinical history, examination, and PBAC scoring were used to make the diagnosis. Baseline hemoglobin was taken. Patients were given tranexamic or NSAIDs in the three menstrual cycles, and then PBAC scores and hemoglobin were reassessed.

Statistical Analysis

The data was analyzed by SPSS 25. The quantitative variables were given in the form of mean, standard deviation, and the qualitative variables in the form of frequencies and percentages. Comparison was done using an independent t-test and a chi-square test. A p-value <0.05 was considered statistically significant.

Ethical Approval Statement

Ethical approval for this study was obtained from the Institutional Review Board/Ethics Committee of the participating tertiary care hospital prior to commencement of the study. All procedures were

conducted in accordance with institutional ethical standards and the principles of the Declaration of Helsinki.

RESULTS

A total of 100 patients were enrolled and equally divided into two groups. The mean age in the tranexamic acid group was 32.4 ± 5.8 years, while in the NSAID group it was 31.9 ± 6.1 years, with no statistically significant difference ($p = 0.68$). Baseline PBAC scores were similar between groups (285 ± 40 vs 279 ± 38; $p = 0.47$). Following three treatment cycles, a significant reduction in menstrual blood loss was observed in both groups; however, the reduction was more pronounced in the tranexamic acid group (145 ± 30) compared to the NSAID group (198 ± 35), with a highly significant difference ($p < 0.001$). Hemoglobin levels improved significantly in both groups, with greater improvement in the TXA group (11.2 ± 1.0 g/dL) compared to the NSAID group (10.6 ± 1.1 g/dL) ($p = 0.002$). Pain relief was significantly better in the NSAID group ($p = 0.01$). Adverse effects were minimal, although mild gastrointestinal symptoms were more frequently reported in the NSAID group. Overall, both treatments were effective and well tolerated.

Table 1: Baseline Characteristics of Study Participants

Variable	Tranexamic Acid (n=50)	NSAIDs (n=50)	p-value
Mean Age (years)	32.4 ± 5.8	31.9 ± 6.1	0.68
Baseline PBAC Score	285 ± 40	279 ± 38	0.47
Hemoglobin (g/dL)	9.8 ± 1.2	9.9 ± 1.3	0.75
Dysmenorrhea (%)	28 (56%)	30 (60%)	0.68

Table 1 shows the baseline demographic and clinical characteristics of both groups. There were no statistically significant differences between groups, indicating comparability before intervention.

Table 2: Comparison of Treatment Outcomes After 3 Cycles

Parameter	Tranexamic Acid (n=50)	NSAIDs (n=50)	p-value
PBAC Score (Post-treatment)	145 ± 30	198 ± 35	<0.001
Reduction in PBAC Score	140 ± 35	81 ± 30	<0.001
Hemoglobin (g/dL)	11.2 ± 1.0	10.6 ± 1.1	0.002

Table 2 demonstrates post-treatment outcomes. Tranexamic acid showed a significantly greater reduction in menstrual blood loss and improvement in hemoglobin levels compared to NSAIDs.

Table 3: Comparison of Symptom Relief

Outcome	Tranexamic Acid (n=50)	NSAIDs (n=50)	p-value
Pain Relief (Improved)	18 (36%)	35 (70%)	0.01
No Pain Relief	32 (64%)	15 (30%)	—

Table 3 compares symptom relief between groups. NSAIDs provided significantly better relief from dysmenorrhea compared to tranexamic acid.

Table 4: Adverse Effects in Both Groups

Side Effect	Tranexamic Acid (n=50)	NSAIDs (n=50)	p-value
Nausea	5 (10%)	8 (16%)	0.37
Gastric Irritation	3 (6%)	12 (24%)	0.02
Headache	4 (8%)	5 (10%)	0.72
No Side Effects	38 (76%)	25 (50%)	0.01

Table 4 presents the frequency of adverse effects. NSAIDs were associated with a higher incidence of gastrointestinal side effects, while tranexamic acid showed better tolerability overall.

DISCUSSION

The current paper was a comparison between the efficacy of nonsteroidal anti-inflammatory drugs (NSAIDS) and tranexamic acid (TXA) in the management of heavy menstrual bleeding (HMB) in women of reproductive age.The study showed that TXA was much more effective in decreasing menstrual blood loss and in ameliorating hemoglobin level, but NSAIDs were superior in ameliorating dysmenorrhea. These findings are in line with existing literature and support the use of TXA as the non-hormonal treatment mode of HMB [11]. The decrease in PBAC scores in this study was also much higher in the TXA group than in the NSAID group ($p < 0.001$). Recent systematic reviews and meta-analyses have found similar study to conclude that antifibrinolytic

therapy like TXA is better than NSAIDs and other non-hormonal interventions in reducing menstrual blood loss [12]. One of the network meta-analyses performed in the recent past also included TXA in the list of the most effective first-line medical interventions in managing HMB, with NSAIDs demonstrating relatively small blood loss reductions [13]. These studies lend great credence to the high efficacy of TXA that was seen in our study.The fact that the hemoglobin levels improved in the TXA group also indicates the clinical advantage of the substance in the prevention of anemia related to chronic HMB. Recent literature has highlighted the positive effects of quality of life and hematological parameters resulting in effective reduction of menstrual blood loss with TXA [14]. Conversely, though NSAIDs showed some improvement in hemoglobin levels in our study, the effect was not as significant, which is in line with other study who found that NSAIDs mainly act on the prostaglandin-mediated pathways, but not the underlying fibrinolytic activity [15]. In terms of alleviating symptoms, we found that NSAIDs were significantly better at alleviating dysmenorrhea ($p = 0.01$). This observation is in line with the known action of NSAIDs, which lower the production of the prostaglandins, thus decreasing uterine contractions and pain. Other past study has also indicated the same findings that NSAIDs can be especially useful in patients with HMB and are associated with considerable menstrual pain, and so are a useful adjunct or alternative treatment in certain situations [16].Randomized trials comparing evidence indicate that in the range of 80-87 per cent of patients respond to TXA therapy as opposed to about 60 per cent to NSAID therapy, which further reinforces the use of TXA as a better agent over NSAIDs in the management of bleeding [17]. Moreover, recent reviews and clinical recommendations have always indicated that TXA has the potential to decrease menstrual blood loss by as much as 50-60% compared to the 20-40% reduction of NSAIDs [18]. These quantitative differences are evident in the extent of the PBAC score reduction in our study. In our study, safety profiles were similar in both groups, where NSAIDs were linked to a greater incidence of gastrointestinal side effects. This is in line with the past findings, which show that NSAIDs can lead to gastric irritation and other gastrointestinal complications, which restrict their use in the long term [19]. On the contrary, TXA was widely tolerated, and adverse effects were few, which underscores its safety in normal clinical practice. The study of this study can be specifically important in the conditions of low resources, where treatment solutions are needed that are cost-effective and available. TXA and NSAIDs are both readily accessible and cheap; however, due to its greater effectiveness in reducing menstrual blood loss, TXA must be the first-line non-hormonal treatment of HMB. Instead, NSAIDs can be better used in patients with dysmenorrhea as the leading cause, or when TXA is contraindicated [20]. On the whole, this study contributes to the existing evidence on the effectiveness of TXA as a treatment for HMB compared to NSAIDs. It is suggested that future large-scale and multicentric studies should help to confirm this study and discuss the long-term outcomes and patient satisfaction.

LIMITATIONS

The limitations of this study are that it is a single-center study, and the sample size is relatively small, which could restrict generalization. Limited long-term outcome evaluation was due to short follow-up. Blinding has not been done, and this could have led to bias. Also, there was no stratification of the underlying causes of heavy menstrual bleeding, which could affect the variability in treatment response.

CONCLUSION

Compared to NSAIDs, tranexamic acid is more effective in reducing menstrual blood loss and enhancing hemoglobin levels in women with heavy menstrual bleeding. But NSAIDs are more effective at relieving pain. Both are safe and effective, and treatment should be tailored according to patient symptoms, preferences, and clinical presentation.

ACKNOWLEDGEMENT

The authors acknowledge the support of the Gomal Medical College,Dera Ismail Khan for facilitating data collection and diagnostic procedures.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

FUNDING

No external funding was received for this study.

INFORMED CONSENT

Written informed consent was obtained from all participants prior to enrollment in the study.

DATA AVAILABILITY STATEMENT

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

DISCLAIMER

The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the affiliated institution.

Author Contributions

Nayyer Latif contributed to the conception and design of the study, data interpretation, and critical revision of the manuscript. **Rubina Baber** contributed to data collection, statistical analysis, and drafting of the manuscript. **Uzma Zaman** contributed to study supervision, manuscript review, and final approval of the version to be published. All authors meet the **ICMJE** authorship criteria and approved the final manuscript.

.

BIBLIOGRAPHY

1. Bryant-Smith AC, Letherby A, Farquhar C, Hickey M. Antifibrinolytics for heavy menstrual bleeding. Cochrane Database Syst Rev. 2018 Apr 15;4(4):CD000249. doi: 10.1002/14651858.CD000249.
2. Herman MC, Mak N, Gemini PM, Wilkens B, Mol BW, Bongers MY; International Heavy Menstrual Bleeding IPD Meta-analysis Collaborative Group. Is the Pictorial Blood Loss Assessment Chart (PBAC) score associated with treatment outcome after endometrial ablation for heavy menstrual bleeding? A cohort study. BJOG. 2017 Jan;124(2):277-282. doi: 10.1111/1471-0528.14434.
3. Wiewel-Verschueren S, Mulder AB, Meijer K, Mulder R. Factor 11 single-nucleotide variants in women with heavy menstrual bleeding. J Obstet Gynaecea. 2017 Oct;37(7):912-918. doi: 10.1080/01443615.2017.1312303.
4. Letherby A, Hussain M, Rishworth JR, Rees MC. Progesterone or progestogen-releasing intrauterine systems for heavy menstrual bleeding. Cochrane Database Syst Rev. 2015 Apr 30;(4):CD002126. doi: 10.1002/14651858.CD002126.
5. Halimeh S, Rott H, Kappert G. PBAC score: an easy-to-use tool to predict coagulation disorders in women with idiopathic heavy menstrual bleeding. Hemophilia. 2016 May;22(3): e217-20. doi: 10.1111/hae.12886.
6. Magnay JL, O'Brien S, Gerlinger C, Seitz C. A systematic review of methods to measure menstrual blood loss. BMC Women's Health. 2018 Aug 22;18(1):142. doi: 10.1186/s12905-018-0627-8.
7. Dahiya P, Dalal M, Yadav A, Dahiya K, Jain S, Silan V. Efficacy of combined hormonal vaginal ring in comparison to combined hormonal pills in heavy menstrual bleeding. Eury J Obstet Gynecology Repro'd Biol. 2016 Aug; 203:147-51. doi: 10.1016/j.ejogrb.2016.05.009.
8. Alan war A, Abbas AM, Hussain SH, Eshwari G, Mansour DY, Faisal MM, Elsherbiny A, Elate E. Oral micronized flavonoids versus tranexamic acid for treatment of heavy menstrual bleeding secondary to copper IUD use: a randomised double-blind clinical trial. Eury J Contracept Repro'd Health Care. 2018 Oct;23(5):365-370. doi: 10.1080/13625187.2018.1515349.
9. Yang BQ, Xu JH, Teng YC. Levonorgestrel intrauterine system versus thermal balloon ablation for the treatment of heavy menstrual bleeding: A meta-analysis of randomized controlled trials. Exp Ther Med. 2015 Nov;10(5):1665-1674. doi: 10.3892/etm.2015.2733.
10. Zia A, Stanek J, Christian-Ranch M, Ahuja SP, Savelli S, O'Brien SH. Utility of a screening tool for hemostatic defects in a multicentre cohort of adolescents with heavy menstrual bleeding. Hemophilia. 2018 Nov;24(6):957-963. doi: 10.1111/hae.13609.
11. Agarwal N, Gupta M, Kriplani A, Batla N, Singh N. Comparison of combined hormonal vaginal ring with ultralow-dose combined oral contraceptive pills in the management of heavy menstrual bleeding: A pilot study. J Obstet Gynaecea. 2016;36(1):71-5. doi: 10.3109/01443615.2015.1024210.
12. Sharief LA, Lawrie AS, Mackie IJ, Halimeh S, Kappert G, Smith C, Peyvandi F, Kadir RA. Plasma factor XIII level variations during menstrual cycle. Blood Coagula Fibrinolysis. 2016 Oct;27(7):786-790. doi: 10.1097/MBC.0000000000000491.
13. Han JY, Lee EJ, Jee BC, Kim SH. Menstrual characteristics in Korean women with endometriosis: a pilot study. Obstet Gynecology Sci. 2018 Jan;61(1):142-146. doi: 10.5468/ogs.2018.61.1.142.
14. Pizzuti S, Lazzeri L, Tosti C, Centini G, Orlandini C, Luisi S, Zupo E, Executes C, Petraglia F. Transvaginal sonographic features of diffuse adenomyosis in 18-30-year-old nulligravid women without endometriosis: association with symptoms. Ultrasound Obstet Gynecol. 2015 Dec;46(6):730-6. doi: 10.1002/uog.14834.
15. Jacobson AE, Vesely SK, Haamid F, Christian-Ranch M, O'Brien SH. Mobile Application vs Paper Pictorial Blood Assessment Chart to Track Manses in Young Women: A Randomized Cross-over Design. J Pediatr Adolis Gynecol. 2018 Apr;31(2):84-88. doi: 10.1016/j.jpag.2017.09.009.
16. Nagma S, Kapoor G, Bharti R, Batra A, Batra A, Aggarwal A, Sablon A. To evaluate the effect of perceived stress on menstrual function. J Clin Diagne Res. 2015 Mar;9(3): QC01-3. doi: 10.7860/JCDR/2015/6906.5611.
17. MacEachern K, Kaur H, Touch M, Muma I, Hamilton A, Scovil S, James P, Elbasan HS, Othman M. Comprehensive evaluation of hemostasis in normal women: impact on the diagnosis of mild bleeding disorders. Clin Appl Thrombi He most. 2015 Jan;21(1):72-81. doi: 10.1177/1076029614527495.
18. Gopi Mohan R, Chandran A, Jacob J, Bhaskar S, Aravindhakshan R, Apem AS. A clinical study assessing the efficacy of a new variant of the levonorgestrel intrauterine system for abnormal uterine bleeding. Int J Gynaecea Obstet. 2015 May;129(2):114-7. doi: 10.1016/j.ijgo.2014.11.023.
19. Arora D, Chawla J, Kochar SPS, Sharma JC. A randomized control trial to assess efficacy of

Mifepristone in medical management of uterine fibroid. Med J Armed Forces India. 2017 Jul;73(3):267-273. doi: 10.1016/j.mjafi.2017.02.013.

20. Zhang D, Xia W, Tong T, Li C, Shi W, Yan MX, Xue RH, Guan XM, Zhang J. Correlation between Cyr61 expression and clinicopathologic parameters in adenomyosis. J Repro'd Immunol. 2016 Nov; 118:42-49. doi: 10.1016/j.jri.2016.08.004.

