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Role of Injection Depot Medroxyprogesterone Acetate in the Management of Heavy Menstrual Bleeding

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ABSTRACT

Introduction: Heavy menstrual bleeding (HMB) is a common gynecological problem which affect 17.9% of Indian women and often leads to anemia, poor quality of life, and psychosocial issues. Depot Medroxyprogesterone Acetate (DMPA), a long-acting injectable progestin, which is an effective, affordable option for HMB management in low-resource settings.

Method: This prospective interventional study done among 70 women aged 18-45 years with HMB who given a single 150 mg intramuscular dose of DMPA. Participants were followed over three months. Menstrual blood loss was assessed using the Pictorial Blood Assessment Chart (PBAC), menstrual health using the Menstrual Health Index (MHI), and hematologic status via hemoglobin and hematocrit levels. Data were analyzed using paired t-tests; $p < 0.05$ was considered significant.

Results: PBAC scores significantly decreased from 136.9 ± 14.1 to 98.0 ± 15.2 ($p < 0.001$), while amenorrhea was achieved in 12.9% of women. Hemoglobin increases from 9.8 ± 0.9 g/dL to 11.4 ± 1.1 g/dL ($p < 0.001$), with moderate anemia dropping from 88.6% to 34.3%. MHI scores also improved significantly. The study is limited by its short three-month follow-up period and the absence of a control group, which may affect the generalizability and comparative interpretation of the findings.

Conclusion: DMPA effectively reduces menstrual blood loss, it also improves hematologic indices and menstrual health, and gives a practical, non-surgical solution for managing HMB.

Keywords: Heavy menstrual bleeding, DMPA, Depot Medroxyprogesterone Acetate, PBAC score, Anemia, Menstrual Health Index, Non-surgical treatment

INTRODUCTION

Heavy menstrual bleeding (HMB) is a common gynecological complaint characterized by excessive menstrual blood loss more than 80 mL per cycle or menstruation lasting more than seven days [1].

The global prevalence of heavy menstrual bleeding (HMB) varies widely depending on population, assessment methods, and setting. A recent multinational study by Sinharoy et al. across South Asia and sub-Saharan Africa reported an overall prevalence of approximately 47%,[2] showing HMB as a common yet under-recognized health issue affecting nearly half of menstruating women in these regions. Similarly, a large internet-based survey in five European countries found that around 27% of women reported two or more symptoms consistent with HMB.[3] In low- and middle-income countries (LMICs), prevalence estimates range broadly from 4% in some African populations to as high as 45.7% in adolescent girls in rural India.[2] In Northern Tanzania, Ibrahim et al. found a self-reported HMB prevalence of 24.1% among women attending an obstetrics and gynecology clinic. The Center for Disease Control and Prevention estimates that about 20% of women in the United States experience HMB during their reproductive years. Overall, HMB affects approximately 18-48% of women worldwide, reflecting a significant global burden of disease with variations influenced by cultural, socioeconomic, and healthcare access factors.[4]

It affects nearly 17.9% of Indian women of reproductive age and can significantly affect on physical, emotional, social, and material quality of life. [5] HMB caused by various factors including uterine fibroids, adenomyosis, bleeding disorders, or endocrine disturbances; however, a substantial proportion of cases are idiopathic.[6] Its management depends on the underlying cause, patient preference, and the severity of symptoms. While surgical interventions such as hysterectomy and endometrial ablation are definitive, they are invasive, costly, and mostly unsuitable for young women who wish to preserve fertility.

Medical therapy is the first-line approach for most cases. Nonsteroidal anti-inflammatory drugs (NSAIDs), tranexamic acid, oral contraceptive pills, and levonorgestrel-releasing intrauterine systems are widely used but may be limited by side effects, contraindications, or poor compliance. Depot medroxyprogesterone acetate (DMPA), a long-acting injectable progestin administered intramuscularly every three months, has emerged as an effective alternative in the medical management of HMB. It induces endometrial atrophy, suppresses ovulation, and reduces menstrual blood loss in a significant proportion of women [7].

Depot Medroxyprogesterone Acetate (DMPA) primarily exerts its effect by suppressing the hypothalamic-pituitary-ovarian (HPO) axis, thereby inhibiting gonadotropin secretion, especially luteinizing hormone (LH), which prevents the LH surge required for ovulation. This leads to consistent anovulation and prevents follicular development. Concurrently, DMPA induces profound changes in the endometrium by causing decidualization followed by glandular atrophy, resulting in a thin, atrophic endometrial lining that is less responsive to estrogen stimulation. Reduced estrogen levels due to suppressed follicular growth remove the primary proliferative stimulus for endometrial growth, leading to menstrual suppression and decreased bleeding.[7]

The continuous progestin exposure alters endometrial vascularity and reduces the functional layer thickness, which decreases menstrual blood loss and is the key mechanism by which DMPA effectively treats heavy menstrual bleeding (HMB). However, this atrophic endometrium may also cause irregular or breakthrough bleeding initially. Over time, sustained endometrial thinning lowers menstrual losses and supports amenorrhea in many users. Thus, DMPA's dual action of ovulation suppression and endometrial atrophy underpins its therapeutic utility in managing HMB.[8,9]

DMPA is useful in low-resource settings due to its affordability, long duration of action, and minimal need for ongoing medical supervision. [10] While some women experience side effects such as irregular bleeding or amenorrhea, studies show that most find it acceptable and effective over time.[11] With this background this study was done to evaluate the clinical efficacy and safety of a single 150 mg dose of DMPA in the management of heavy menstrual bleeding in women attending a tertiary care center in Western Uttar Pradesh.

MATERIALS AND METHODS

This was a prospective interventional study done for one year, from 1st February 2024 to 31st March 2025, to assess the effectiveness of Depot Medroxyprogesterone Acetate (DMPA) in the management of heavy menstrual bleeding (HMB). The study was done in the gynecology outpatient and inpatient departments, among women aged 18-45 years having heavy menstrual bleeding. The sample size was calculated based on a prevalence of HMB in India of 17.9% as documented in Agrawal et al. study.[5] Using the formula for sample size estimation with a 95% confidence interval (Z=1.96), prevalence (p=0.179), and absolute error (d=0.10), the calculated sample size was 57. After adding 10% for non-response or dropout, the adjusted final sample size was 70.

Women were included if they were of reproductive age (18-45 years) and had HMB due to adenomyosis with uterine size less than 14 weeks, uterine fibroid less than 4 cm, or endometrial hyperplasia without atypia. No blinding was done. Patients in which HMB caused by polyps, adenomyosis with uterine size more than 14 weeks, fibroids greater than 4 cm, hyperplasia with atypia, presence of intrauterine devices, bleeding of unknown etiology, current or suspected pregnancy, intention to conceive within the next six months, active or previous thromboembolic disorders, suspected or known breast malignancy, hypersensitivity to DMPA, and uncontrolled comorbidities such as diabetes mellitus, hypertension, liver disorders, and migraine were excluded from the study.

All eligible participants underwent a detailed clinical evaluation, including history, physical examination, and relevant investigations. Informed written consent was obtained after explaining the procedure. Each participant was assessed using a structured proforma before and after the administration of 150 mg of DMPA. The severity of menstrual bleeding was quantified using the Pictorial Blood Assessment Chart (PBAC), where scores ≥100 were considered indicative of HMB. [12] The PBAC assigns points based on the saturation level of sanitary pads and presence of clots or flooding. A score of 1, 5, and 20 points was assigned to lightly, moderately, and fully soaked pads, respectively. Small clots were scored as 1-point, large clots as 5 points, and flooding or overflow as 10 points. Daily scores were recorded and summed over the course of each menstrual cycle.

Menstrual health and quality of life were assessed using the Menstrual Health Index (MHI), which evaluates four domains: menstrual cycle pattern, menstrual absorbents, psychosocial impact, and hygiene practices. Scores range from 0 to 36, with scores between 0-12 showing poor, 13-24 average, and 25-36 good menstrual health. MHI was recorded at baseline and again after three months. [13]

Following baseline assessments, all participants received an intramuscular injection of DMPA, which was stored at room temperature (15-30°C) and injected into the deltoid muscle using aseptic technique. After injection, the site was not massaged, though gentle pressure was applied in case of minor bleeding. Participants were followed up monthly for three cycles, during which PBAC scores, MHI, and any adverse events were recorded using the predesigned proforma.

Data were entered and analyzed using SPSS version 26.0. Descriptive statistics were used for demographic and clinical data. Paired t-tests were applied to assess changes in PBAC scores before and after treatment. A p-value of <0.05 was considered statistically significant. Participants who missed follow-up visits or discontinued treatment were considered dropouts and were not included in the final efficacy analysis. An intention-to-treat (ITT) approach was not applied, and analysis was performed including only participants with complete data for the specified time points.

Ethical clearance was obtained from the Institutional Ethics Committee before initiation of the study. Informed written consent was taken from each participant, and confidentiality of patient information was maintained throughout the study.

RESULTS

A total of 70 women diagnosed with heavy menstrual bleeding (HMB) were enrolled in this study. The majority of women were in the age group of 31-40 years (42.9%),

followed by 21-30 years (31.4%), 41-45 years (18.6%), and only 7.1% were aged 20 years or younger.

Regarding menstrual patterns, 41% reported unpredictable and irregular cycles, and 37.7% had cycles of less than 21 or greater than 35 days, showing a high prevalence of cycle irregularities in HMB patients. Only 21.3% had a normal cycle length of 21-35 days.

Among study participants 55.7% reported heavy (+++) bleeding and 16.4% experiencing clot-associated bleeding. Dysmenorrhea was also common, among 52.9% reporting severe menstrual pain and 34.3% had moderate pain.

The most commonly used menstrual hygiene product was sanitary pads (67.1%), followed by home cloth (12.9%), tampons (10%), and menstrual cups (10%). By the third month, 87.1% had adopted clean and hygienic sanitation methods, with 100% reporting availability and accessibility of absorbents every month. 9 patients were lost to follow up at 3rd month.

There was a highly significant and consistent reduction in menstrual blood loss (MBL) was observed across follow-up visits, as measured using the Pictorial Bleeding Assessment Chart (PBAC). PBAC scores dropped from 136.9 ± 14.1 (baseline) to 98.0 ± 15.2 (3 months) ($p < 0.001$). we compared data of patient's wo completed their follow up visit and exclude one who lost to follow up. so, for M3 comparison only 61 compared. (Table 1)

Table 1: Comparison of mean menstrual blood loss scores based on pictorial bleeding assessment chart (PBAC) at different time points following depot medroxyprogesterone acetate treatment

Time Points Compared	Mean ± SD (First)	Mean ± SD (Second)	Cases	p-value
M0 vs M1	135.3 ± 14.8	120.3 ± 15.4	70	<0.001
M1 vs M2	120.3 ± 15.4	111.0 ± 15.5	70	<0.001
M2 vs M3	113.1 ± 14.8	98.0 ± 15.2	61	<0.001
M0 vs M3	136.9 ± 14.1	98.0 ± 15.2	61	<0.001

Table 2: Duration of menstrual bleeding (in days) at baseline and follow-up after DMPA treatment

Duration (Days)	M0 (%)	M1 (%)	M2 (%)	M3 (%)
2	-	-	-	2 (2.9)
3	-	-	3 (4.4)	4 (5.7)
4	-	5 (7.1)	7 (10.3)	11 (15.7)
5	-	9 (12.9)	9 (13.2)	9 (12.9)
6	16 (22.9)	15 (21.4)	15 (22.1)	18 (25.7)
7	17 (24.3)	16 (22.9)	18 (26.5)	16 (22.9)
8	11 (15.7)	18 (25.7)	12 (17.6)	8 (11.4)
9	12 (17.1)	3 (4.3)	3 (4.4)	2 (2.9)
10	14 (20.0)	4 (5.7)	1 (1.5)	-

Table 3: Hematological profile over time

Timepoint	Hb (g/dL) Mean ± SD	Hematocrit Mean ± SD	No Anemia n (%)	Moderate Anemia n (%)
Baseline (M0)	9.8 ± 0.9	28.8 ± 2.7	0 (0.0%)	62 (88.6%)
Month 1	10.4 ± 1.0	30.5 ± 3.0	0 (0.0%)	44 (62.9%)
Month 2	10.9 ± 1.0	32.0 ± 3.0	9 (12.9%)	33 (47.1%)
Month 3	11.4 ± 1.1	33.5 ± 3.2	25 (35.7%)	24 (34.3%)
p-value	<0.001	<0.001		

At baseline (M0), majority of patients reported prolonged menstrual bleeding durations, with 20% experiencing 10-day bleeding, 17.1% with 9 days, and only 22.9% having a shorter 6-day duration. By the third month (M3), the proportion of women experiencing 9-10 days of bleeding dropped significantly to just 2.9% and 0%, respectively. These findings show that DMPA effectively reduces the duration of menstrual bleeding in patients with heavy menstrual bleeding, over the course of 3 months, showing a more regular and manageable menstrual pattern (Table 2).

By the end of 3 months, amenorrhea was achieved in 9 patients (12.9%). In addition, the proportion of women experiencing heavy menstrual bleeding decreased from 85.7% at 1 month to 55.7% at 3 months, showing a trend toward symptom alleviation.

There was a significant improvement in hematological parameters was seen throughout the study due to reduced blood loss. Hemoglobin increased from 9.8 ± 0.9 g/dL at baseline to 11.4 ± 1.1 g/dL at 3 months. Hematocrit increase from 28.8% to 33.5% over the same period. The percentage of non-anemic patients improved from 0% to 35.7%, while moderate anemia declined from 88.6% to 34.3% by month 3 (Table 3).

There was a statistically significant improvement in the Menstrual Health Index (MHI) score, from 25.4 ± 2.6 at baseline to 27.2 ± 2.5 at month 3 ($p < 0.001$). A majority (85.7%) of participants had a "Good" MHI score at 3 months, up from 82.9% at baseline.

Despite clinical improvements, psychosocial burden remained significant. About 78.6% of patients still missed school or social events more than four times per year due to menstrual issues. Further, 18.6% reported severe mood changes, and 12.9% had minimal changes related to menstruation like irregular bleeding. changes in weight were not measured during our study.

Discussion

In this study, most patients with heavy menstrual bleeding treated with Depot Medroxyprogesterone Acetate (DMPA) were aged 31-40 years (30, 42.9%), followed by 21-30 years (22, 31.4%), 41-45 years (13, 18.6%), and ≤ 20 years (5, 7.1%). Thus, 74.3% of users were aged 21-40 years a core reproductive period when heavy menstrual bleeding is most common.[14]

Current guidelines recommend DMPA for post-menarcheal adolescents and adults, though not before menarche. Adolescents aged 12-18 years may benefit with careful bone mineral density monitoring.[15] The 7.1% of users aged ≤ 20 years in our study are similar to these recommendations. Furthermore, trials comparing DMPA and LNG-IUS typically include women aged ≥18 years, supporting DMPA's appropriateness across this reproductive range. [16]

Out of 70 participants, sanitary pads were most commonly used (47, 67.1%), followed by home cloth (9, 12.9%), tampons (7, 10.0%), and menstrual cups (7, 10.0%). This shows the increasing reliance on disposable pads, echoing NFHS-5 data showing 64.1% pad use among women aged 15-24 years up from 41.8% in NFHS-4. [17] Notably, tampon and menstrual cup usage in our cohort is higher than reported elsewhere in India. Tampon use in France was 45.6% [17], while in South Korea tampon and cup usage were 4.2% and 1.6%, respectively [18]. Menstrual cups reusable with capacities up to 80 mL were used by 10.0% of our participants [17,19] possibly showing an emerging sustainable trend. A study found that after initial challenges, 66.04% preferred cups over pads [18]. However, comfort and awareness issues may limit widespread adoption. The persistence of home cloth use (12.9%) shows the need for improved education and access, especially given regional disparities 93.0% cloth use in tribal areas versus 98.0% pad use in urban slums. [20]

After 3 months of DMPA treatment, 9/70 (12.9%) reported amenorrhea, while 61 (87.1%) continued menstruating. This early amenorrhea rate is lower than some reports of up to 30% at 3 months, increasing to 55% at 12 months and 68% at 24 months. [21] A compliance study showed 4.4% amenorrhea after the first dose and 11.7% after the second closely matching our rate. [14] Another study reported 35.2% amenorrhea (time unspecified) [22] and an Indonesian cohort reported a much higher 89.3% at 3 months [23], possibly due to differing definitions or patient characteristics.

Mean PBAC scores decrease significantly from 135.3 ± 14.8 (baseline, M0) to 120.3 ± 15.4 (M1), 111.0 ± 15.5 (M2), and 98.0 ± 15.2 (M3); comparing M0 to M3, scores decreased from 136.9 ± 14.1 to 98.0 ± 15.2 ($p<0.001$). This shows DMPA's progressive effectiveness in reducing menstrual blood loss. Comparable studies show PBAC declines from 279.0 ± 42.5 to 127.96 ± 38.13 at 3 months with intramuscular MPA ($p<0.001$) [24], and reductions from 238.7 to 108 after 3 months with MPA [25]. In addition, oral versus injectable MPA showed decreases from 284 ± 50 to 146 ± 21 (injectable) and 230 ± 36 to 154 ± 30 (oral), both significant ($p<0.001$) [26].

Bleeding days reduced over the 3 months: by M3, 2 (2.9%) bled for 2 days, 4 (5.7%) for 3 days none at baseline and 11 (15.7%) for 4 days (none at M0). Those bleeding 6 days remained stable (~22-26%), and ≥7-day bleeding declined. This is similar to studies showing early irregular or prolonged bleeding with initial DMPA use [27] and irregular/spotting reported in 39.08% of users [22]. Over mid-to-long-term use (6-24 months), amenorrhea rates reach 57% at 12 months and 68% at 24 months [28], systematic reviews show amenorrhea rising from 12% in the first 90 days to 46% by four 90-day intervals (~1 year) [29].

Mean hemoglobin levels increased from 9.8 ± 0.9 g/dL (M0) to 10.4 ± 1.0 (M1), 10.9 ± 1.0 (M2), and 11.4 ± 1.1 (M3), with $p<0.001$ for each interval showing significant hematological benefit within 3 months. Similar study show increase in Hb from 8.42 ± 0.64 to 10.17 ± 0.81 g/dL at 3 months ($p<0.001$) [24], and increases from 11.42 ± 1.08 to 13.13 ± 1.15 g/dL in 3 months [30]. Some postpartum studies found no significant changes at 3-6 months ($p>0.05$) [31], while longer-term reports show improvements in hemoglobin and ferritin at 12 months [32]. Mechanistically, endometrial atrophy and ovulation suppression reduce bleeding and support iron recovery [29].

At baseline, 62/70 (88.6%) had moderate anemia and 8 (11.4%) had mild anemia; none were anemia-free. By M3, 25 (35.7%) were non-anemic, 21 (30.0%) mild anemia, and 24 (34.3%) moderate, with no severe cases.

Other study also supports this trend, though severity categories were unspecified [24,30]. The anemia improvement correlates with reduced menstrual loss and improved hemoglobin levels due to DMPA's mechanism.

The proportion of women reporting heavy menstrual bleeding decreased over time. Similar studies found PBAC score drops from 279.0 ± 42.5 to 127.96 ± 38.14 at 3 months ($p<0.001$) [24] and a 60% PBAC reduction [25]. In an RCT comparing DMPA and tranexamic acid, 75% of DMPA users had complete or partial HMB resolution at 3 months [33], similar to our 44.3% no-longer-HMB rate. Amenorrhea as a marker of HMB resolution increases with duration: 12-25% at 3 months, 55% at 12 months, and 68% at 24 months [27,29,34].

Strengths and Limitations

This prospective interventional study has notable strengths, including its forward-looking design, which allowed systematic monitoring of clinical response over time. The use of validated assessment tools such as the Pictorial Blood Assessment Chart (PBAC) and Menstrual Health Index (MHI) enhanced the objectivity and reproducibility of outcome measurement. Additionally, the study's focus on a low-resource clinical setting offers practical insights into the applicability of Depot Medroxyprogesterone Acetate as a cost-effective treatment option in real-world scenarios, particularly where surgical or high-cost hormonal therapies are not easily accessible.

However, certain limitations must also be acknowledged. The study followed a single-arm design without the inclusion of a comparator group, which restricts direct comparison with other standard therapies for heavy menstrual bleeding. The relatively short follow-up period of three months limits the ability to draw conclusions regarding long-term efficacy, recurrence after discontinuation, and sustained patient compliance. Being conducted in a tertiary care center, there is a risk of selection bias, as patients presenting to such facilities may not represent the general population. Furthermore, the study did not evaluate bone mineral density changes or long-term adverse effects, which are relevant safety considerations for prolonged DMPA use.

Future studies with longer follow-up duration, inclusion of a control group, and assessment of long-term safety parameters such as bone health and metabolic impact would provide more robust evidence to guide clinical practice.

Conclusion

This study shows that Depot Medroxyprogesterone Acetate (DMPA) is an effective, safe, and affordable non-surgical option for managing heavy menstrual bleeding (HMB). Over

a three-month period, DMPA led to significant reductions in blood loss and reduced anemia. It also positively influenced menstrual hygiene practices, WASH indicators, and psychosocial well-being. The overall improvement in menstrual health and quality of life shows that DMPA should be considered a valuable first-line therapy, especially in resource-limited settings or when surgical options are not feasible.

Individual Authors' Contributions: FN contributed to all stages, including study conception, design, data collection, analysis, interpretation, and manuscript preparation. **RA** participated only in study conception, Study design and manuscript preparation.

Availability of Data: The data supporting this study's findings are available upon reasonable request to corresponding author.

Declaration of Non-use of Generative AI: The authors affirm that no generative artificial intelligence tools were utilized in the design, analysis, interpretation of data, or preparation of this manuscript. All content is the result of the authors' original work.

REFERENCES

1. Davies J, Kadir RA. Heavy menstrual bleeding: An update on management. Thromb Res 2017;151 Suppl 1:S70-7. DOI: https://doi.org/10.1016/S0049-3848(17)30072-5 PMid:28262240
2. Sinharoy SS, Chery L, Patrick M, Conrad A, Ramaswamy A, Stephen A, Chipungu J, Reddy YM, Doma R, Pasricha SR, Ahmed T, Chiwala CB, Chakraborti N, Caruso BA. Prevalence of heavy menstrual bleeding and associations with physical health and wellbeing in low-income and middle-income countries: a multinational cross-sectional study. Lancet Glob Health. 2023 Nov;11(11):e1775-e1784. DOI: https://doi.org/10.1016/S2214-109X(23)00416-3. Erratum in: Lancet Glob Health. 2023 Dec;11(12):e1862. DOI: https://doi.org/10.1016/S2214-109X(23)00507-7. PMID: 37802092
3. Fraser IS, Mansour D, Breymann C, Hoffman C, Mezzacasa A, Petraglia F. Prevalence of heavy menstrual bleeding and experiences of affected women in a European patient survey. Int J Gynaecol Obstet. 2015 Mar;128(3):196-200. DOI: https://doi.org/10.1016/j.ijgo.2014.09.027 PMid:25627706
4. Singh SS, Calaf Alsina J, Vannuccini S, Koga K, Lopes Silva-Filho A, Yang X, Estrade JP, Catherino W. Clinical perspectives on the menstrual pictogram for the assessment of heavy menstrual bleeding. Hum Reprod Open. 2022 Oct 29;2022(4):hoac048. DOI: https://doi.org/10.1093/hropen/hoac048 PMid:36382010 PMCid:PMC9651972
5. Agarwal M, Smita Singh S, Sinha S, Sinha HH. Comparison of Bleeding Pattern and Quality of Life Before and After the Insertion of a Levonorgestrel Intrauterine System for Heavy Menstrual Bleeding: A Seven-Year Review. Cureus 2023;15(3):e36142. DOI: https://doi.org/10.7759/cureus.36142
6. James AH. Heavy menstrual bleeding: work-up and management. Hematology Am Soc Hematol Educ Program. 2016 Dec 2;2016(1):236-242. DOI: https://doi.org/10.1182/asheducation-2016.1.236 PMid:27913486 PMCid:PMC6142441
7. Buck E, McNally L, Vadakekut ES, Jenkins SM. Menstrual Suppression. NASPAG Essentials of Pediatric & Adolescent Gynecology 2024:353. DOI: https://doi.org/10.1016/B978-0-443-10512-8.00041-2
8. Boonyawat K, O'Brien SH, Bates SM. How I treat heavy menstrual bleeding associated with anticoagulants. Blood 2017;130(24):2603-2609. DOI: https://doi.org/10.1182/blood-2017-07-797423 PMid:29092828
9. El Fattah IAA. Using phytoestrogens as aprophylaxis against irregular uterine bleeding possibly occurring while using Depot-medroxyprogesterone acetate (DMPA) as a contraceptive method. Int J Reprod Contracept Obstet Gynecol 2017;3(4):977-981. DOI: https://doi.org/10.5455/2320-1770.ijrcog20141219
10. Albertazzi P, Bottazzi M, Steel SA. Bone mineral density and depot medroxyprogesterone acetate. Contraception 2006;73(6):577-83. DOI: https://doi.org/10.1016/j.contraception.2006.02.004
11. Bianchi P, Guo SW, Habiba M, Benagiano G. Utility of the Levonorgestrel-Releasing Intrauterine System in the Treatment of Abnormal Uterine Bleeding and Dysmenorrhea: A Narrative Review. J Clin Med 2022;11(19):5836. DOI: https://doi.org/10.3390/jcm11195836 PMid:36233703 PMCid:PMC9570961
12. Higham JM, O'Brien PMS, Shaw RW. Pictorial Blood Loss Assessment Chart - eLearning Platform 2014. https://elearning.wfh.org/resource/pictorial-blood-loss-assessment-chart/ (accessed March 28, 2025).
13. Jamal S, Singh S. Menstrual Health Index: A Novel Approach to Assess Safe Menstrual Practices in Adolescents and Young Adults. J Obstet Gynaecol India 2023;73(3):270-278. DOI: https://doi.org/10.1007/s13224-022-01707-x PMid:37324375 PMCid:PMC10267031
14. Kaushal N, Shirodker SD, Mukherjee A, Kokne M. Study of compliance of depot medroxy progesterone acetate in contraception in a tertiary care hospital. Int J Reprod Contracept Obstet Gynecol 2025;14(2):462-466. DOI: https://doi.org/10.18203/2320-1770.ijrcog20250055
15. DEPO-PROVERA® CI (medroxyprogesterone acetate injectable suspension, for intramuscular use) Dosage Forms and Strengths Patient information | Pfizer Medical - US. Available from: https://www.pfizermedical.com/patient/depo-provera/dosage-forms (Last accessed July 17, 2025).

16. Jain S, Mani P. Study of menstrual pattern changes in patients accepting injection depo-medroxyprogesterone acetate versus levonorgestrel intrauterine system. Int J Reprod Contracept Obstet Gynecol 2021;10(2):469-473. DOI: https://doi.org/10.18203/2320-1770.ijrcog20210295

17. Zode M, Sodhi B, Basu S. Menstrual hygiene practices, determinants, and association with reproductive tract infection in India: a large repeated cross-sectional analysis (2015-2021). J Biosoc Sci 2025;57(3):385-399. DOI: https://doi.org/10.1017/S0021932025000252 PMid:40336253

18. Choi H, Lim NK, Jung H, Kim O, Park HY. Use of Menstrual Sanitary Products in Women of Reproductive Age: Korea Nurses' Health Study. Osong Public Health Res Perspect. 2021 Feb;12(1):20-28. DOI: https://doi.org/10.24171/j.phrp.2021.12.1.04 PMid:33659151 PMCid:PMC7899234

19. Best Period Products for Heavy Flow Days - Period Nirvana 2024. Available from: https://www.periodnirvana.com/best-period-products-for-heavy-flow-days/ (accessed July 17, 2025).

20. EXPLORING PREFERENCES, HYGIENIC USE AND DISPOSAL OF MENSTRUAL MATERIALS AMONG ADOLESCENT GIRLS. Findings from a study in Gaya, Kanker, Dindori and Hyderabad 2021. Available from: https://www.wateraid.org/in/sites/g/files/jkxoof336/files/2022-03/UNFPA%20MHM%20KAP%20Report-FINAL.pdf (Last accessed July 17, 2025).

21. WHO-PQ RECOMMENDED SUMMARY OF PRODUCT CHARACTERISTICS 2020. Available from: https://extranet.who.int/prequal/sites/default/files/whopar_files/MA135part4.pdf (Last accessed July 17, 2025).

22. Roy S, Patra S, CHALKRABARTY S. A STUDY ON ACCEPTANCE AND COMPLIANCE OF DEPOT MEDROXY PROGESTERONE ACETATE FOR POST-PARTUM CONTRACEPTION IN A TERTIARY CARE CENTRE IN EASTERN INDIA. Asian J Pharm Clin Res. 2024 Jan. 7;17(1):61-63. DOI: https://doi.org/10.22159/ajpcr.2024.v17i1.47943

23. Elisabeth Venesia Manek1) AP 2) CBP. Relationship between the duration of injectable contraceptive Depo Medroxy Progesterone Acetat (DMPA) With the Occurrence of Amenorrhea in Family Planning Acceptors at the Pratama Delima Rahayu Clinic, Sragen. Journal of Advanced Nursing and Health Sciences 2024;5(1):1-10. DOI: https://doi.org/10.34035/kn.v5i1.1284

24. Bhagyashree T1 KMRBCIKB and RB. A Study On Control Of Abnormal Uterine Bleeding By The Use Of Medroxy Progesterone Acetate (MPA) In Reproductive Women At A Tertiary Care Hospital. Research Journal of Pharmaceutical, Biological and Chemical Sciences 2025;11(8):1800-1811.

25. Shravage J, Mekhala D, Bellad MB, Ganachari MS, Dhumale HA. Ormeloxifene versus Medroxyprogesterone Acetate (MPA) in the Treatment of Dysfunctional Uterine Bleeding: A Double-Blind Randomized Controlled Trial. Journal of South Asian Federation of Obstetrics and Gynaecology 2011;3(1):21-24. DOI: https://doi.org/10.5005/jp-journals-10006-1116

26. Küçük T, Ertan K. Continuous oral or intramuscular medroxyprogesterone acetate versus the levonorgestrel releasing intrauterine system in the treatment of perimenopausal menorrhagia: a randomized, prospective, controlled clinical trial in female smokers. Clin Exp Obstet Gynecol. 2008;35(1):57-60. PMID: 18390083.

27. Depot medroxyprogesterone acetate (DMPA) injections: an intermediate option. bpac Better Medicine 2021. Available from: https://bpac.org.nz/2021/contraception/depot.aspx (Last accessed August 6, 2025).

28. United nations population fund- India. Frequently asked questions about DMPA: Depot Medroxy Progesterone Acetate 2018. Available from: https://india.unfpa.org/sites/default/files/pub-pdf/faq_for_asha_workers_english.pdf (Last accessed August 6, 2025).

29. Hubacher D, Lopez L, Steiner MJ, Dorflinger L. Menstrual pattern changes from levonorgestrel subdermal implants and DMPA: systematic review and evidence-based comparisons. Contraception 2009;80(2):113-118. DOI: https://doi.org/10.1016/j.contraception.2009.02.008 PMid:19631785

30. Mohammed Khairy Ali. Tranexamic Acid and Depot-Medroxyprogesterone Acetate for Perimenopausal Irregular Uterine Bleeding. National Center for Biotechnology Information 2024. Available from: https://clinicaltrials.gov/study/NCT04710017 (Last accessed August 6, 2025)

31. Kochar S, Kumar A, Nama A, Suthar N. A prospective study to know the efficacy of short-term use of injectable depot medroxy progesterone acetate for contraception in tertiary care hospital from North West Rajasthan, India. Int J Reprod Contracept Obstet Gynecol 2020;9(6):2482-2485. DOI: https://doi.org/10.18203/2320-1770.ijrcog20202333

32. Effects of contraceptives on hemoglobin and ferritin. Task Force for Epidemiological Research on Reproductive Health, United Nations Development Programme/United Nations Population Fund/World Health Organization/World Bank Special Programme of Research, Development and Research Training in Human Reproduction, World Health Organization, Geneva, Switzerland. Contraception. 1998 Nov;58(5):262-273. PMID: 9883381.

33. Anan MA, Elshazly MA, Shehata AS, Fahmy MS. Tranexamic acid versus Depot- Medroxyprogesterone acetate in treatment of perimenopausal irregular uterine bleeding: Randomized clinical trial. Department of Obstetrics and Gynecology, Faculty of Medicine- Aswan University, Aswan, Egypt 2023;3(2):169-174.

34. DEPO-PROVERA 150 mg/mL Injection New Zealand Data Sheet. Policy Commons 2024. Available from: https://policycommons.net/artifacts/12665546/new-zealand-data-sheet/13563695/ (Last accessed August 6, 2025).