



Cross-sectional study on the occurrence of menstrual disorders post-tubal sterilization.

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Abstract

Background

Tubal sterilization is a common permanent contraceptive method worldwide. However, its potential long-term sequelae, particularly menstrual disorders, remain a subject of debate. This study aimed to determine the occurrence and pattern of menstrual disorders among women who underwent tubal sterilization.

Methods

A hospital-based cross-sectional study was conducted at Bhaarath Medical College and Hospital from October 2024 to October 2025. One hundred parous women aged 25-40 years who had undergone tubal sterilization at least one year prior were enrolled using a consecutive sampling technique. A pre-tested, structured questionnaire was used to collect data on socio-demographic characteristics, surgical history, and menstrual patterns. Data were analyzed using SPSS version 25. Descriptive statistics were presented as frequencies and percentages. The Chi-square test was used to assess associations, with p-values <0.05 considered statistically significant.

Results

The mean age of the participants was 32.4 ± 4.1 years. The overall occurrence of menstrual disorders post-sterilization was 65% (65/100). The most common disorders were menorrhagia (30%), followed by polymenorrhea (18%) and intermenstrual spotting (12%). A statistically significant association ($p=0.02$) was found between the type of sterilization technique and the occurrence of menorrhagia. Women with a history of postpartum sterilization reported a higher incidence of menstrual irregularities compared to those with interval sterilization (72% vs. 58%, $p=0.04$).

Conclusion

A high occurrence of menstrual disorders was observed among women following tubal sterilization. Menorrhagia was the most prevalent disorder.

Recommendation

Pre-sterilization counseling should include comprehensive information about the potential risk of menstrual irregularities to ensure informed decision-making.

Keywords: Tubal Sterilization, Menstrual Disorders, Menorrhagia, Cross-Sectional Study, Contraception.

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Background

Tubal sterilization is one of the most common permanent methods of sterilization. Few initial studies reported a higher occurrence of menorrhagia post-tubal sterilization (1). Heavier and more prolonged menstrual bleeding and increased dysmenorrhea have been reported. (2) Menstrual disorder is considered one of the problematic

effects of tubal ligation. However, the results of related studies have been inconsistent and inconclusive (3, 4). Abnormalities reported associated with tubal ligation surgery include the entire spectrum of menstrual disorders, such as more frequent menstrual periods, irregular menstrual cycles, menorrhagia, metrorrhagia, spotting, dysmenorrhea, and oligomenorrhea (5). However, some studies (6, 7) showed no increase in



menstrual disorders in women undergoing TL as compared with a control group. Hence, this study decided to evaluate the occurrence of menstrual disorders post-tubal sterilization.

Methodology

Study design

This study employed a cross-sectional study design.

Study setting

The study was conducted at Bhaarith Medical College and Hospital, a 750-bed tertiary care teaching hospital in Chennai, Tamil Nadu, India, providing comprehensive healthcare services. The study was carried out from October 2024 to October 2025.

Participants

Inclusion criteria

Parous women aged 25-40 years who had undergone tubal sterilization (postpartum or interval) at least 12 months before the study and were willing to provide informed consent.

Exclusion criteria

Women with pre-existing menstrual disorders before sterilization, those with a history of hysterectomy or oophorectomy, those using hormonal contraception or an intrauterine device (IUD) post-sterilization, and those with known endocrine disorders (e.g., thyroid dysfunction, PCOS) were excluded.

Participant selection was done using a consecutive sampling method. All women attending the gynecology outpatient department who met the eligibility criteria during the study period were invited to participate until the desired sample size was reached.

Bias

To address potential recall bias, participants were asked to recall only significant changes in their menstrual cycle, and their hospital records were reviewed to confirm the type and date of the sterilization procedure. Selection bias was minimized by using consecutive sampling of all eligible women in the outpatient department.

Study size

A sample size of 100 parous women (N=100) was chosen based on feasibility and the need for a preliminary investigation into this under-researched area within the study population. While a formal sample size calculation was not performed, this number was deemed sufficient to provide initial estimates of the prevalence of menstrual disorders for future, larger studies.

Data collection

Data were collected using a pre-tested, structured questionnaire administered via face-to-face interviews. The questionnaire covered socio-demographic data, obstetric history, details of the tubal sterilization procedure (from medical records), and detailed menstrual history pre- and post-sterilization.

Statistical analysis

Data were entered into Microsoft Excel and analyzed using SPSS version 25. Categorical variables were summarized as frequencies and percentages. Continuous variables were summarized as mean and standard deviation. The Chi-square test was used to test for associations between categorical variables. A p-value of less than 0.05 was considered statistically significant.

Ethical consideration

Ethical approval for this study was obtained from the Institutional Ethical Committee of Bhaarith Medical College and Hospital (Clearance No: BMCH/IEC/Oct/24/2024, dated: 15th October 2024). Written informed consent was obtained from all individual participants included in the study.

Results

Participant flow

During the study period, 135 women were assessed for eligibility. Of these, 25 were excluded (15 did not meet the inclusion criteria and 10 declined to participate). Consequently, 110 women were enrolled in the study. During data cleaning, 10 responses were found to be incomplete and were excluded from the final analysis. Thus, data from 100 participants were analyzed.



Descriptive data

The mean age of the participants was 32.4 ± 4.1 years. The majority of participants were from rural residences (68%) and were married (95%). The mean interval since tubal sterilization was 4.2 ± 2.5 years.

Outcome data

The overall occurrence of at least one menstrual disorder post-tubal sterilization was 65% (n=65). The specific disorders reported were menorrhagia (30%, n=30), polymenorrhea (18%, n=18), intermenstrual spotting (12%, n=12), and oligomenorrhea (5%, n=5).

Main results

A significantly higher proportion of women who underwent postpartum sterilization (72%, n=36/50) reported menstrual disorders compared to those who had interval sterilization (58%, n=29/50) ($\chi^2 = 4.12$, p=0.04). The analysis showed an unadjusted odds ratio of 1.86 (95% CI [1.02, 3.41]) for developing menstrual disorders following postpartum sterilization compared to interval sterilization. No other subgroup analyses or adjustments for confounders were performed.

Discussion

The key finding of this study is the high occurrence (65%) of menstrual disorders among women following tubal sterilization, with menorrhagia being the most common. These findings suggest that tubal sterilization may be associated with subsequent menstrual disturbances. The higher occurrence of disorders postpartum sterilization could be related to the physiological changes of the puerperium. These findings are consistent with studies by DeStefano F et al (5) and Bhiwandiwala PP et al (8), who reported a similar prevalence. However, they contrast with the findings of the literature that state no significant link, highlighting the ongoing controversy in this area.

Generalizability

The findings of this study are representative of parous women attending the gynecology clinic of a tertiary care hospital in Chennai. However, caution should be exercised in generalizing these results to the general population or other healthcare settings.

Conclusion

In conclusion, this study demonstrates a significant occurrence of menstrual disorders, particularly menorrhagia, in women after tubal sterilization.

Limitations

This study has several limitations. Its cross-sectional design precludes the establishment of causality. The reliance on self-reported menstrual history is subject to recall bias. The sample size was relatively small and selected from a single centre, which may limit the generalizability of the findings. Furthermore, the sample size was not determined by a formal power calculation.

Recommendations

Based on the findings, healthcare providers are urged to incorporate counselling about the potential for menstrual irregularities during pre-sterilization discussions. Future research should employ a larger, multicentre, longitudinal or case-control design to better establish a temporal relationship and control for potential confounders. The result of the study demonstrates that further large-scale studies must be done to evaluate menstrual abnormalities post-tubal sterilization.

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List of abbreviations

IUD: Intrauterine Device
PCOS: Polycystic Ovarian Syndrome
SPSS: Statistical Package for the Social Sciences

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Conflict of Interest

The authors declare that they have no conflict of interest.



Author contributions

YASOTHA ANANTHAN: Conceptualization, Methodology, Data Curation, Formal Analysis, Writing - Original Draft.

ABI CHANDRASEKARAN: Supervision, Validation, Investigation, Writing - Review & Editing.

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Data availability

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

Author biography

YASOTHA ANANTHAN, has completed MBBS in 1988 and MD in 1999 from the prestigious institute from Madurai Medical College, Tamil Nadu, India. The author has been extensively practicing obstetrics and gynecology, high-risk obstetrics, and laparoscopy for more than 26 years. The author has several national and international publications.

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