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Prevalence and Severity of Cyclic Mastalgia Among Women in Chengalpattu District: A Community-based Cross-sectional Study

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Abstract

Mastalgia is one of the most common breast-related complaints among women of reproductive age and may negatively affect quality of life. This study aimed to determine the prevalence and severity of cyclic mastalgia among women residing in the Chengalpattu district of Tamil Nadu. A community-based cross-sectional descriptive study was conducted among 381 women aged 20–40 years recruited through community awareness camps using convenience and snowball sampling techniques. Data were collected using a structured questionnaire that included demographic details and pain assessment tools such as the Visual Analogue Scale and a breast pain chart to document cyclical pain patterns across the menstrual cycle. Descriptive statistics were used to summarize the data, and the association between menstrual phase and pain intensity was evaluated using the chi-square test. Cyclic mastalgia was reported by 320 participants, yielding a prevalence of 84%. Mild pain was the most commonly reported severity (44.6%), followed by moderate pain (37.0%), while severe pain was relatively uncommon (2.4%). Pain intensity showed a statistically significant association with menstrual cycle phase ($p < 0.001$), with symptoms predominantly occurring during the luteal phase. Diffuse bilateral breast pain was the most frequently reported anatomical presentation. These findings indicate a high prevalence of cyclic mastalgia among women of reproductive age in Chengalpattu district. Although most cases were mild to moderate, the condition may still influence physical comfort and psychological well-being. Increasing community awareness and incorporating routine breast pain assessment in primary healthcare settings may help reduce anxiety and improve quality of life.

Keywords: Breast Pain, Chengalpattu District, Cyclic Mastalgia, Prevalence.

Introduction

Breast pain, medically referred to as mastalgia or mastodynia, is one of the most frequently reported breast-related symptoms among women of reproductive age. It represents a common clinical concern encountered in both primary care and gynecological practice. Epidemiological estimates indicate that a substantial proportion of women experience breast discomfort at some point in their lives, making mastalgia one of the leading causes of breast-related consultations. Although the condition is generally benign, it frequently generates considerable anxiety among affected individuals due to concerns regarding the possibility of breast cancer (1).

Among the benign structural conditions associated with breast pain are simple breast cysts, which are commonly linked to fibrocystic breast changes. These cysts are fluid-filled lesions lined by epithelial cells within the breast parenchyma and may present as microcysts or macrocysts. Epidemiological evidence indicates that simple breast cysts may be detected in approximately one in fourteen women, particularly during the reproductive years (2). Despite the frequent association of mastalgia with benign structural changes, the precise biological mechanisms underlying cyclic breast pain remain incompletely understood. Multiple hormonal, metabolic, and structural mechanisms have been proposed, yet none fully explain the variability in symptom severity and presentation observed among different individuals (3).

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Clinically, mastalgia is categorized into two major types: cyclic and non-cyclic breast pain. Cyclic mastalgia is the more prevalent form and is typically observed in women between 30 and 40 years of age (4, 5). This type of breast pain demonstrates a clear temporal association with the menstrual cycle and is believed to be influenced by hormonal fluctuations, particularly changes in estrogen, progesterone, and prolactin levels (6). Women experiencing cyclic mastalgia commonly report bilateral and diffuse breast pain characterized by sensations of heaviness, swelling, fullness, or tenderness. Although many women experience mild and transient symptoms, some individuals report persistent or distressing pain that interferes with daily activities, sleep quality, and overall well-being (7, 8).

In contrast, non-cyclic mastalgia lacks a consistent relationship with the menstrual cycle and is more commonly observed in perimenopausal or older women (9). This form of breast pain may arise from several underlying pathological or structural conditions involving the breast or adjacent tissues. Reported causes include breast cysts, periductal mastitis, stretching of Cooper's ligaments, traumatic fat necrosis, Mondor's disease, diabetic mastopathy, and, in rare cases, malignant breast lesions (10, 11). Compared with cyclic mastalgia, non-cyclic breast pain is typically more localized and persistent, often presenting as focal tenderness in a specific area of the breast. Because of the diverse etiological factors involved, non-cyclic mastalgia may present diagnostic and therapeutic challenges for clinicians, frequently requiring comprehensive clinical assessment and imaging studies to rule out significant pathology (12, 13).

Several biological and psychosocial mechanisms have been proposed to explain the development of cyclic mastalgia, as illustrated in Figure 1 (the figure made by the author based on the existing literatures). Hormonal imbalance remains one of the most widely accepted explanations, particularly involving fluctuations in estrogen and progesterone levels that influence breast tissue vascularity and fluid retention. Increased sensitivity of breast tissue to circulating hormones may also contribute to symptom development. Additionally, disturbances in fatty acid metabolism have been suggested to alter prostaglandin synthesis, potentially leading to inflammatory changes and breast tissue edema (14, 15). Neuroendocrine pathways, psychological factors, including stress and anxiety, have also been implicated in influencing the perception and severity of breast pain through activation of the hypothalamic–pituitary–adrenal axis (16, 17). Despite the considerable apprehension experienced by many women presenting with mastalgia, current evidence indicates that isolated breast pain without associated clinical abnormalities is rarely linked to breast malignancy (18–20).

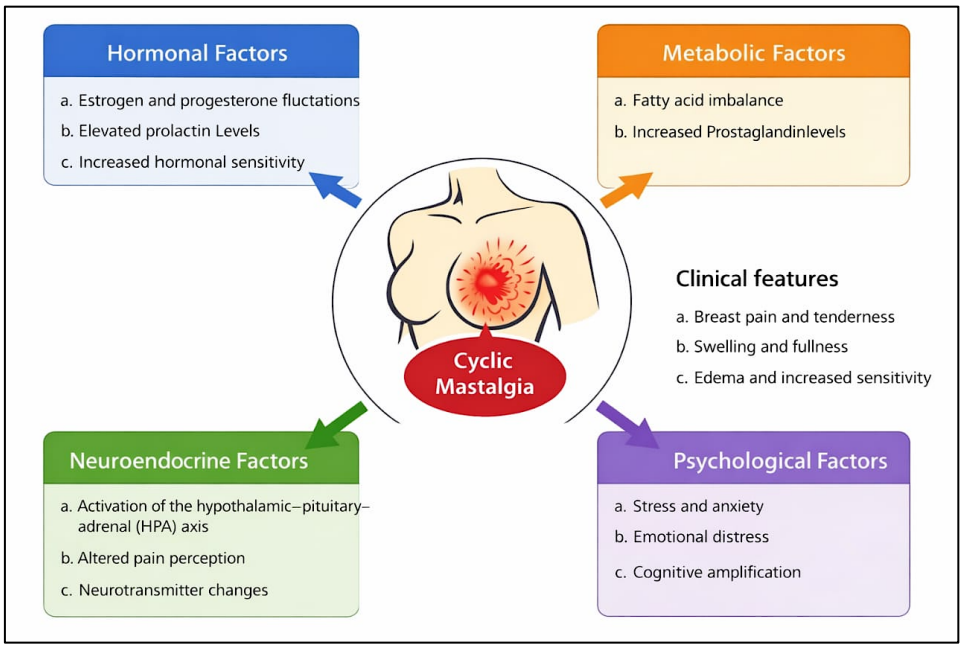

Figure 1: Proposed Mechanism of Cystic Mastalgia

Previous epidemiological studies have reported substantial variability in the prevalence of mastalgia across different populations. Globally, the prevalence of mastalgia has been reported to range from 41% to 79%, reflecting differences in study populations, diagnostic criteria, and research methodologies (21). Within the Indian context, studies conducted primarily in urban tertiary healthcare settings have documented prevalence rates ranging between 51% and 54% among women attending outpatient clinics (22, 23). Ultrasonographic evaluation of women presenting with mastalgia frequently reveals benign conditions such as fibrocystic changes or simple breast cysts (24). Although cyclic mastalgia is generally mild to moderate in severity, a subset of women experiences persistent or severe symptoms that negatively affect physical comfort, emotional well-being, sexual health, and overall quality of life (25).

Despite the growing body of literature on mastalgia, several limitations exist within previous research. A large proportion of available studies are hospital-based and therefore may not accurately represent the true prevalence of mastalgia within the general community. Consequently, the epidemiological patterns of mastalgia observed in clinical populations may differ from those in community-based populations. Another important limitation is the relative scarcity of community-based epidemiological studies examining cyclic mastalgia in semi-urban and rural regions of India. Most available evidence originates from metropolitan healthcare centers, leaving a substantial gap in understanding the prevalence and characteristics of mastalgia in non-urban populations. Regional variations in lifestyle, reproductive health practices, healthcare accessibility, and sociocultural perceptions of breast health may influence both the occurrence and reporting of breast pain.

Addressing these knowledge gaps is essential for improving awareness, early reassurance, and appropriate management of benign breast pain. Community-level data may assist healthcare providers in distinguishing physiological cyclic mastalgia from conditions requiring further investigation and can help reduce unnecessary anxiety and diagnostic interventions among women experiencing breast pain.

The novelty of the present study lies in its community-based approach and its focus on describing the clinical patterns of cyclic mastalgia in a semi-urban district population that has been relatively underrepresented in previous research.

The objectives of the present study were:

a) To determine the prevalence of cyclic mastalgia among women of reproductive age in the Chengalpattu district.
b) To assess the severity of breast pain using the Breast Pain Chart.
c) To evaluate the association between breast pain intensity and different phases of the menstrual cycle.
d) To identify the common anatomical distribution of breast pain among affected participants.

Methodology

This community-based study employed a non-experimental cross-sectional descriptive design to determine the prevalence and severity of cyclic mastalgia among women in the Chengalpattu district of Tamil Nadu, India. The study was conducted during the year 2025 and adhered to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for observational research (26).

The source population comprised women residing in various areas of Chengalpattu district. Women aged between 20 and 40 years were considered eligible to participate. Participants were included if they had regular menstrual cycles and reported breast discomfort suggestive of cyclic mastalgia. Women were excluded if their breast pain was attributable to pregnancy, chest wall disorders, known breast lumps, diagnosed breast malignancy, irregular menstrual cycles, hormone therapy usage, or systemic medical conditions such as psychiatric disorders or cardiovascular diseases.

Participants were recruited through awareness camps organized at different community locations across the district. Prior to enrolment, an educational video explaining cyclic mastalgia, its possible causes, and common clinical features was presented to the participants. Women who expressed willingness to participate and met the eligibility criteria were included in the study after obtaining written informed consent. Participants were recruited using a combination of convenience

and snowball sampling techniques from different community areas of Chengalpattu district, Tamil Nadu, India (approximate GPS coordinates: 12°41′ N; 79°59′ E).

The required sample size was determined using the single population proportion formula given in Equation [1].

$$n = Z^2P(1 - P) / d^2 \quad [1]$$

Where, n denotes the required sample size, Z represents the standard normal deviate corresponding to the 95% confidence level (1.96), P represents the estimated prevalence, and d denotes the margin of error.

Assuming a prevalence of 50% to ensure maximum variability and a margin of error of 5%, the calculated minimum sample size was 381 participants, which was achieved in the present study (27).

Data were collected using a structured, researcher-designed questionnaire consisting of two components. The first component recorded sociodemographic and reproductive details, including age, marital status, obstetric history, menstrual history, and relevant medical history. The second component assessed breast pain characteristics and severity. Pain intensity was evaluated using the Visual Analogue Scale (VAS), while cyclical variation in pain was documented using a standardized breast pain chart to identify patterns across different phases of the menstrual cycle (28).

Ethical approval for the study was obtained from the SRM Institutional Ethics Committee (Reference No. 2172/IEC/2020). All participants were informed about the purpose, procedures, and voluntary nature of the study before participation. Confidentiality and anonymity were maintained throughout data collection and analysis, and the study was conducted in accordance with the principles outlined in the Declaration of Helsinki.

The collected data were analyzed using IBM SPSS Statistics for Windows (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarize demographic characteristics, prevalence of cyclic mastalgia, pain intensity, and anatomical distribution of breast pain. Continuous variables were expressed as mean ± standard deviation (SD), while categorical variables were presented as frequencies and percentages.

The association between pain intensity and menstrual cycle phase was evaluated using the Chi-square test. A p-value < 0.05 was considered statistically significant.

Results

A total of 381 women aged 20–40 years participated in the study. The mean age of the participants was 23.9 ± 5.3 years, indicating that the sample predominantly consisted of young adult women. With regard to marital status, 214 participants (56.2%) were unmarried, whereas 167 (43.8%) were married. The demographic characteristics of the study population are presented in Table 1.

Table 1: Demographic Characteristics of the Study Participants (N = 381)

Demographic Characteristics	**Mean**	**SD**
Age (years)	23.9	5.3
Marital Status	**Frequency**	**Percentage**
Married	167	43.8%
Unmarried	214	56.2%

Table 2: Prevalence of Breast Pain Among Participants

Pain Status	**Frequency**	**Percentage**
Yes	320	84.0%
No	61	16.0%

Overall, the study cohort primarily consisted of young women in the early reproductive age group, with a slightly higher proportion of unmarried participants.

The prevalence of breast pain suggestive of cyclic mastalgia among the participants is shown in Table 2. Out of the total sample, 320 women (84.0%) reported experiencing breast pain, whereas 61 women (16.0%) reported no breast pain at the time of assessment.

These findings indicate a high prevalence of cyclic mastalgia in the studied population.

The severity distribution of breast pain assessed using the Breast Pain Chart is presented in Table 3. Among the participants, mild pain was the most frequently reported severity (44.6%), followed by

moderate pain (37.0%), while severe pain was relatively uncommon (2.4%). Additionally, 16.0% of participants reported no pain.

Overall, mild to moderate pain constituted the majority of reported symptoms, whereas severe pain was rarely observed.

Table 3: Intensity of Breast Pain Assessed Using the Breast Pain Chart

Pain Intensity	Frequency	Percentage
No pain	61	16.0%
Mild	170	44.6%
Moderate	141	37.0%
Severe	9	2.4%

Table 4: Pain Intensity Across Different Phases of the Menstrual Cycle

Menstrual Phase	Mild n (%)	Moderate n (%)	Severe n (%)	p- value
Overall	96 (62.3%)	57 (37.0%)	2 (0.6%)	
Luteal phase	57 (43.2%)	66 (50.0%)	9 (6.8%)	<0.001
Follicular phase	16 (47.1%)	18 (52.9%)	0 (0%)	

The relationship between pain intensity and menstrual cycle phase is presented in Table 4. Pain symptoms were more pronounced during the luteal phase, where moderate pain was reported by 66 participants (50.0%), followed by mild pain in 57 participants (43.2%) and severe pain in 9 participants (6.8%). In contrast, during the follicular phase, moderate pain was reported by 18 participants (52.9%), while 16 participants (47.1%) reported mild pain, and no severe pain was observed.

A statistically significant association was observed between pain intensity and menstrual phase ($p < 0.001$), with symptoms occurring more frequently and intensely during the luteal phase.

The anatomical distribution of breast pain is summarized in Table 5. The most common presentation was diffuse bilateral breast pain, reported by 260 participants (77.5%). Pain localized to the upper outer quadrant was reported by 36 participants (13.85%), while focal point tenderness was reported by 25 participants (9.62%).

Table 5: Anatomical Location of Breast Pain Among Participants

Location of Pain	Frequency	Percentage
Diffuse bilateral pain	260	77.5%
Upper outer quadrant	36	13.85%
Focal point tenderness	25	9.62%

These findings indicate that diffuse bilateral breast pain represents the predominant clinical presentation of cyclic mastalgia, whereas localized pain patterns occur less frequently.

Discussion

The present study provides community-based evidence regarding the burden and clinical pattern of cyclic mastalgia among women of reproductive age in the Chengalpattu district. The findings demonstrate that breast pain is highly prevalent in this population, with 84% of participants reporting symptoms consistent with cyclic mastalgia. This prevalence appears higher than many previously reported estimates from urban populations in India. One possible explanation is that community-based sampling may capture a broader spectrum of symptomatic individuals who might not otherwise seek medical consultation. Additionally, increased awareness during the screening camps may have encouraged participants to report symptoms that are often overlooked or considered insignificant (29).

The majority of affected women in the present study experienced mild to moderate breast pain, while severe pain was relatively uncommon. Although mild mastalgia is frequently regarded as a physiological manifestation of cyclical hormonal changes, its cumulative impact on daily life should not be underestimated (30). Persistent low- to moderate-intensity breast pain may influence routine activities, physical movement, sleep quality, and psychological well-being. Similar observations have been reported in previous studies, which suggest that cyclic mastalgia, despite being a benign condition, can negatively influence functional status and health-related quality of life among affected women (31).

A significant association between pain intensity and menstrual phase was also observed in this study. Symptoms were predominantly reported during the luteal phase, with moderate and severe

pain occurring more frequently during this period. This pattern supports the well-established hormonal basis of cyclic mastalgia (32). During the luteal phase, fluctuations in estrogen and progesterone levels are believed to increase breast tissue vascularity and stromal edema, resulting in heightened breast sensitivity and discomfort. The minimal occurrence of severe pain during the follicular phase further supports the cyclical hormonal influence on symptom manifestation (33, 34).

In terms of anatomical distribution, diffuse bilateral breast pain was the most commonly reported presentation among participants. This pattern is consistent with hormonally mediated mastalgia rather than focal structural pathology (35). Localized or quadrant-specific pain was relatively less frequent, suggesting that most participants experienced generalized cyclical breast tissue changes rather than isolated lesions or localized inflammatory processes (36). Clinically, this distinction is important because diffuse bilateral mastalgia is rarely associated with malignant breast conditions and typically responds well to reassurance, lifestyle modification, and conservative management.

In addition to hormonal influences, psychosocial and lifestyle factors may contribute to the perception and reporting of breast pain. Stress-related neuroendocrine responses can influence pain modulation pathways and potentially amplify symptom perception. Emerging literature indicates that psychological distress, anxiety related to fear of breast cancer, and body image concerns may heighten the subjective experience of breast pain (37, 38). Furthermore, metabolic factors such as variations in body mass index and hormonal regulation may also influence symptom severity. Although these variables were not specifically examined in the present study, their potential role highlights the need for further investigation in future research.

Despite its high prevalence, mastalgia remains poorly understood among many women, and breast pain is frequently misinterpreted as an indicator of serious disease. Such misconceptions may lead to unnecessary anxiety and excessive diagnostic investigations (39). Therefore, the findings of this study emphasize the importance of structured patient education and early reassurance within primary healthcare settings. Providing accurate information about the benign and cyclical nature of most mastalgia cases may help reduce anxiety, encourage timely consultation, and prevent unnecessary medical interventions.

From a broader public health perspective, documenting the magnitude and characteristics of cyclic mastalgia at the community level is important for guiding preventive and educational strategies. Incorporating routine screening for breast pain during reproductive health consultations and integrating counselling interventions into women's health programs may improve symptom management and overall quality of life. Furthermore, future longitudinal studies examining hormonal profiles, lifestyle factors, and psychosocial determinants would provide deeper insights into the etiology and progression of cyclic mastalgia.

Overall, the findings of the present study contribute valuable regional evidence on cyclic mastalgia and highlight the importance of improving awareness, early reassurance, and conservative management approaches for women experiencing breast pain.

Conclusion

Cyclic mastalgia was found to be highly prevalent among women of reproductive age in the Chengalpattu district. The majority of participants reported mild to moderate breast pain that occurred predominantly during the luteal phase of the menstrual cycle and typically presented as diffuse bilateral discomfort. These findings reinforce the widely accepted hormonal basis of cyclic mastalgia and highlight its relevance as a common yet often underrecognized condition that may affect women's physical comfort, emotional well-being, and overall quality of life.

The present study contributes to the limited regional epidemiological evidence regarding cyclic mastalgia among reproductive-aged women. By documenting the pattern, timing, and severity of symptoms in this population, the study provides useful baseline information that may support clinicians and healthcare professionals in identifying and addressing cyclic breast pain during routine clinical evaluation. Increased awareness of cyclic mastalgia can help reduce unnecessary anxiety among women who may fear serious breast pathology and can encourage timely

counseling and appropriate management strategies.

Despite these contributions, certain limitations should be acknowledged. The cross-sectional study design limits the ability to establish causal relationships between potential contributing factors and cyclic mastalgia. Additionally, the reliance on self-reported symptoms may introduce recall bias or subjective interpretation of pain intensity. The study was also conducted within a single district, which may limit the generalizability of the findings to broader populations with different demographic or socio-cultural characteristics.

Future research should employ longitudinal or prospective study designs to better understand temporal relationships and potential causal factors associated with cyclic mastalgia. Incorporating objective measures such as hormonal profiling, as well as evaluating lifestyle, dietary, psychological, and environmental influences, may provide deeper insights into the multifactorial determinants of this condition. Such investigations could contribute to the development of more effective prevention strategies, patient education programs, and evidence-based management approaches for women experiencing cyclic mastalgia.

Abbreviations

BMI: Body Mass Index, CI: Confidence Interval, SPSS: Statistical Package for the Social Sciences, STROBE: Strengthening the Reporting of Observational Studies in Epidemiology, VAS: Visual Analogue Scale.

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Author Contributions

SF Mariyam Farzana: conceptualization, study design, methodology development, data collection, manuscript drafting, VM Vinodhini: conceptualization, study design, critical review, scientific supervision, P Venkataraman: methodology development, statistical analysis, interpretation, Bhanumathy Mohanakrishnan: critical review, scientific supervision, B Sathyaprabha: statistical analysis, interpretation, critical review, scientific supervision. All authors have approved the final draft of the manuscript.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Data Availability

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

Declaration of Artificial Intelligence (AI) Assistance

The authors declare that artificial intelligence (AI)-assisted tools were used solely for language refinement, grammatical editing, and structural organization of the manuscript. All scientific content, data interpretation, analysis, and conclusions were developed and verified by the authors. The authors take full responsibility for the accuracy and integrity of the manuscript.

Ethics Approval

The study was approved by the SRM Institutional Ethics Committee (Reference No. 2172/IEC/2020). The research was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Written informed consent was obtained from all participants prior to enrollment.

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