e-ISSN: 0976-822X, p-ISSN:2961-6042

Available online on http://www.ijcpr.com/

International Journal of Current Pharmaceutical Review and Research 2025; 17(8); 1205-1210

Original Research Article

Patterns of Breast Lump Presentation and Factors Causing Delay in Diagnosis in Rural India

Aditi Raut[1], Sivaji Ghose[2], Mili Das Chowdhary[3], Shubham Mehta[4]

[1]2nd Year Resident, Department of General Surgery, Vedantaa Institute of Medical Sciences, Dahanu, Palghar, Maharashtra, India

[2]Professor and Head of Department, Department of General Surgery, Vedantaa Institute of Medical Sciences, Dahanu, Palghar, Maharashtra, India

[3]Professor, Department of Obstetrics and Gynaecology, INHS Sanjivani

[4]3rd Year Resident, General Surgery, Vedantaa Institute of medical sciences, Dahanu, Palghar, Maharashtra, India

Received: 01-06-2025 / Revised: 16-07-2025 / Accepted: 19-08-2025

Corresponding Author: Dr. Aditi Raut

Conflict of interest: Nil

Abstract

Breast lumps are among the most common clinical presentations in women, ranging from benign conditions such as fibroadenomas and cysts to malignant tumors, particularly breast cancer. Globally, breast cancer is the most frequent cancer in women, and in India, it now accounts for nearly one-third of all female malignancies. Despite improvements in awareness and early detection in urban populations, women in rural India continue to experience significant delays in diagnosis, resulting in late-stage presentation and poorer outcomes. The epidemiology of breast lumps in rural areas shows that while benign conditions predominate, the burden of malignancy is rising, with younger age at onset and higher rates of advanced disease compared to Western populations. Multiple factors contribute to these delays, including lack of awareness, cultural stigma, reliance on traditional healers, financial hardship, limited female autonomy, and systemic barriers such as poor diagnostic infrastructure and inadequate referral mechanisms. The consequences are severe, with advanced-stage diagnosis, increased treatment costs, reduced survival, and psychological as well as socio-economic strain on families and communities. Addressing these challenges requires multifaceted interventions, including community-based awareness programs, training of frontline health workers, integration of breast health education into rural health schemes, technology-driven solutions such as telemedicine, and strengthening diagnostic capacity at the district level. This review synthesizes current evidence on presentation patterns, barriers to timely diagnosis, and strategies to improve breast health outcomes in rural India.

Keywords: Breast lump, Rural India, Diagnostic delay, Breast cancer.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0) and the Budapest Open Access Initiative (http://www.budapestopenaccessinitiative.org/read), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Breast lumps represent one of the most common clinical presentations encountered in women worldwide, encompassing a spectrum of conditions ranging from benign lesions such as fibroadenomas, cysts, and fibrocystic changes to malignant tumors, most notably breast cancer.[1] Globally, breast cancer remains the leading cause of cancer-related morbidity and mortality among women, with more than 2.3 million new cases reported annually and accounting for nearly 685,000 deaths in 2020, according to GLOBOCAN data.[2] Although benign breast diseases are more prevalent than malignant ones, the public health concern lies in the significant overlap of clinical features, often necessitating prompt evaluation to exclude cancer.[3] In India, breast cancer has emerged as the most common cancer among women, surpassing cervical cancer in many regions. Current estimates suggest that breast cancer accounts for approximately 28% of all female cancers in the country, with an increasing incidence in both urban and rural areas.[4] Notably, studies report that nearly 20–30% of women in India present with breast lumps, and a substantial proportion of these are malignant at the time of diagnosis. The burden is compounded by the younger age at presentation compared to Western populations, with a sizeable proportion of cases occurring before the age of 50 years.[5] Early detection of breast lumps, particularly malignant ones, is crucial for improving prognosis, reducing the need for aggressive therapies, and enhancing survival rates. In developed nations, widespread awareness, organized screening programs, and better healthcare access have resulted in earlier diagnosis and improved outcomes. Conversely,

delayed presentation in India remains a pressing challenge, especially in rural areas with limited healthcare resources.[6]

A marked rural–urban disparity exists in the presentation and outcomes of breast lump cases. Urban women generally have greater health literacy and easier access to diagnostic and treatment facilities and are more likely to present earlier, often at operable stages.[7] In contrast, rural women frequently delay seeking medical attention due to socio-cultural barriers, financial constraints, and inadequate healthcare infrastructure, leading to advanced-stage presentation, limited treatment options, and poorer survival outcomes.[7]

Given the rising incidence of breast lumps and cancers, coupled with the distinct challenges faced by rural populations, it becomes imperative to synthesize existing evidence on presentation patterns and contributory factors to diagnostic delays. Such understanding is essential for guiding public health strategies and tailoring interventions suited to rural India's unique socio-cultural and healthcare context. Therefore, reviewing the patterns of breast lump presentation and factors contributing to diagnostic delay in rural India is interesting.

Epidemiology of Breast Lump in Rural India

Breast lumps are among the most common presenting complaints in women across rural India, with prevalence estimates ranging from 3% to 10% depending on the region and study population.[8] While benign breast diseases such as fibroadenomas, fibrocystic changes, and mastitis constitute the majority of cases (about 60–70%), a substantial proportion—nearly 30–40%—are malignant. Importantly, rural women are more likely to present with advanced breast cancer compared to their urban counterparts, with locally advanced or metastatic disease comprising up to two-thirds of presentations.[9] Age distribution further highlights that benign lesions are most frequent in young women aged 15–30, whereas malignant lumps commonly occur between 40 and 60.[10] Notably, breast cancer in India tends to present at a younger age than in Western countries, with a significant number of cases diagnosed before the age of 50 years.[10]

Regional variations in epidemiology also exist across the country. In northern states such as Uttar Pradesh and Bihar, malignancies are more common and often detected at stage III or IV, reflecting severe diagnostic delays.[11] Southern states like Tamil Nadu, Kerala, and Karnataka, which have relatively better health infrastructure and awareness programs, report higher proportions of benign breast disease. However, breast cancer incidence is also rising steadily. In central India, including Madhya Pradesh and Chhattisgarh, both benign and malignant conditions are frequent, but advanced-stage cancers remain predominant.[12] Overall, while benign lesions remain the most common breast lumps in rural India, the malignant burden is increasing, marked by younger age at onset and advanced stage at diagnosis.[13]

Patterns of Presentation

The clinical spectrum of breast lump presentation in rural India is broad, with most women reporting a painless lump as the initial symptom. Painless masses are particularly concerning, as they are often associated with malignant pathology, whereas painful or tender lumps tend to suggest benign conditions such as mastitis or fibroadenoma.[14]

Other presenting features include nipple discharge, ulceration, retraction, and changes in skin texture such as dimpling or peau d'orange, though these are typically associated with more advanced disease.[15] Unfortunately, many rural women delay seeking medical consultation until these secondary symptoms appear, reflecting late presentation and disease progression.[15]

The stage at diagnosis is a critical indicator of health-seeking behavior and system efficiency, and in rural India, most women are in the advanced stages (stage III or IV). Younger women often present with fibroadenomas and other benign lumps, while malignant lumps are more frequently observed among perimenopausal and postmenopausal women.[16]

However, unlike Western populations, Indian data show a higher proportion of premenopausal breast cancers, emphasizing an earlier age of onset. Cultural perceptions also play a significant role in symptom interpretation. In rural communities, breast-related symptoms are often considered taboo, leading to embarrassment, denial, or a preference for home remedies and traditional healers.[8] Fear of cancer diagnosis, social stigma, and hesitation to undergo breast examinations—particularly by male physicians—further contribute to delays in clinical presentation. These patterns underscore a unique intersection of biological, cultural, and healthcare-related factors influencing breast lump presentation in rural India.[17]

Factors Causing Delay in Diagnosis

Delays in the diagnosis of breast lumps in rural India are the result of a complex interplay between individual, socio-economic, and health-system determinants. These delays not only contribute to advanced-stage presentation of breast cancer but also significantly affect prognosis, treatment outcomes, and quality of life.[18]Factors causing delay in diagnosis of breast lumps in rural India are shown in Table 1.

Table 1: Factors Causing Delay in Diagnosis of Breast Lumps in Rural India

Category	Specific Factor	Description	Impact on Diagnosis	Supporting Evidence (India-based)
Patient-related[19]	Lack of awareness	Poor knowledge of breast health, self-examination, and cancer warning signs	Delayed recognition of symptoms and late medical consultation	Studies from Uttar Pradesh and Bihar show <20% awareness of breast self-examination
	Misconceptions about breast lumps	Belief that painless lumps are harmless or temporary	Ignoring early symptoms	Hospital-based surveys report a high prevalence of myths
	Stigma and cultural taboos	Fear of social exclusion, embarrassment in discussing breast symptoms	Concealment of symptoms, hesitation to seek care	The Rural Madhya Pradesh study noted stigma as a key barrier
	Fear of diagnosis and treatment	Anxiety about cancer, mastectomy, and loss of femininity	Avoidance of hospitals until the advanced stage	Multiple tertiary care studies report "fear of mastectomy" as a major reason for late-stage diagnosis.
	Reliance on traditional healers	Initial consultation with local healers or use of home remedies	Delayed referral to allopathic care	Common in rural Maharashtra and Rajasthan
	Family/household prioritization	Women place domestic responsibilities above personal health	Delay until severe symptoms appear	Studies note women often present only when pain/ulceration develops
Socio-economic[20]	Poverty	High out-of-pocket expenses for travel, consultation, and tests	Patients postpone or avoid diagnostic visits	Financial constraints are cited in >50% of rural delay cases
	Low female autonomy	Male dominance in health-related decisions	Dependence on family approval before seeking care	Reported widely in rural Haryana and UP
	Educational status	Illiteracy or low schooling limits health literacy	Poor recognition of symptoms, difficulty navigating the health system	Studies show illiterate women present at more advanced stages
	Employment status	Lack of financial independence in women	Inability to seek care without family support	Noted in rural Gujarat and Odisha
Health-system[21]	Limited access to facilities	Lack of diagnostic services in PHCs/CHCs	Need to travel long distances for imaging/biopsy	NCRP rural registries report under-utilization of primary facilities
	Shortage of female healthcare providers	Reluctance to consult male doctors for breast examination	Non-reporting of symptoms or skipped check-ups	Cultural barriers noted in northern rural states
	Inadequate referral systems	Weak linkages between primary, secondary, and tertiary care	Multiple visits before the diagnosis is confirmed	Reported across multiple ICMR rural studies
	Lack of diagnostic infrastructure	Absence of mammography, FNAC, and pathology services locally	Delays in obtaining a confirmatory diagnosis	Only district hospitals usually provide such services

	Long waiting times	Overburdened tertiary centers, delayed biopsy reports	Further prolongs initiation of treatment	Cited in AIIMS and JIPMER rural outreach analyses
	Poor follow-up mechanisms	Lack of patient tracking after referral	Missed appointments and delayed treatment initiation	Common issue in rural cancer programs

Consequences of Delay

Delayed diagnosis of breast lumps in rural India often results in advanced-stage presentation, where curative options become limited and treatment outcomes are poor. Women frequently present with stage III or IV disease, in contrast to the earlier detection possible with timely medical attention.[22] This late-stage diagnosis leads to greater treatment complexity, often requiring multimodal therapy involving surgery, chemotherapy, radiotherapy, and targeted agents.[23] Consequently, the economic burden on rural families increases substantially, with many forced to borrow money, sell assets, or discontinue treatment due to unaffordability. The escalation in cost and intensity of treatment underscores the critical importance of early detection, which improves survival and reduces financial strain.[23]

The consequences extend beyond clinical outcomes, encompassing psychological and socio-economic dimensions. Delayed diagnosis is associated with poorer survival rates, with five-year survival dropping below 40% in late-stage disease compared to 70–80% for early-stage cancers.[24] The uncertainty and stigma surrounding breast disease further contribute to psychological distress, including anxiety, depression, and fear of social rejection.[25] For families and communities, the illness of a woman—who often plays a central caregiving and economic role—creates cascading challenges such as loss of income, disruption of children's education, nutritional insecurity, and increased caregiving demands. Thus, delays in diagnosis represent not only a medical issue but also a broader social and economic burden in rural India.[25]

Interventions and Strategies for Improvement

Reducing diagnostic delay in rural India requires a blend of community-level initiatives, workforce strengthening, and integration of breast health into existing health programs. Community-based awareness campaigns are essential to overcome low knowledge and cultural stigma associated with breast lumps.[26] Village-level education through women's groups, self-help collectives, and local leaders in regional languages has proven effective in improving health-seeking behavior. Training frontline workers such as Accredited Social Health Activists (ASHA) and Auxiliary Nurse Midwives (ANM) can further bridge the gap, as the community trusts these workers and often serves as the first point of contact.[27] Their involvement in providing breast health education, performing basic clinical breast examinations, and facilitating referrals can substantially enhance early detection. Integrating breast self-examination (BSE) promotion into national rural health schemes, particularly under the National Health Mission, ensures that awareness is systematically disseminated alongside other routine public health interventions.[28]

Technology-driven approaches and health system strengthening offer additional opportunities to reduce delays. Mobile health (mHealth) applications, telemedicine consultations, and outreach clinics expand diagnostic reach in underserved areas. In contrast, mobile vans equipped with ultrasound and cytology facilities have shown promise in pilot projects across India.[29] At the same time, strengthening primary and secondary care capacity is critical. Ensuring the availability of diagnostic modalities such as ultrasound, fine-needle aspiration cytology, and biopsy at district hospitals, together with improved referral pathways to tertiary centers, can significantly shorten the diagnostic timeline.[30] These interventions, when implemented in a coordinated and culturally sensitive manner, can play a pivotal role in promoting early diagnosis and improving breast health outcomes in rural India.[30]

Conclusion

Delays in the diagnosis of breast lumps remain a critical challenge in rural India, where limited awareness, socio-cultural barriers, economic constraints, and inadequate healthcare infrastructure collectively contribute to late-stage presentation and poor outcomes. Strengthening community awareness, empowering frontline health workers, integrating breast health into existing programs, and expanding diagnostic capacity at the primary and secondary levels are essential steps toward improving early detection.

Targeted, culturally sensitive interventions and health system reforms can not only reduce the burden of advanced breast cancer but also enhance survival, quality of life, and overall public health in rural communities.

References

1. Malherbe K, Khan M, Fatima S. Fibrocystic Breast Disease [Internet]. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2025 [cited 2025 Aug 25]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK551609/.
2. Arnold M, Morgan E, Rumgay H, Mafra A, Singh D, Laversanne M, et al. Current and future burden of breast cancer: Global statistics for 2020 and 2040. Breast [Internet] 2022 [cited 2025 Aug 25];66:15–23. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9465273/.
3. Sangma MBM, Panda K, Dasiah S. A Clinico-Pathological Study on Benign Breast Diseases. J Clin Diagn Res [Internet] 2013 [cited 2025 Aug 25];7(3):503–6. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3616566/.
4. Kulothungan V, Ramamoorthy T, Sathishkumar K, Mohan R, Tomy N, Miller GJ, et al. Burden of female breast cancer in India: estimates of YLDs, YLLs, and DALYs at national and subnational levels based on the national cancer registry programme. Breast Cancer Res Treat [Internet] 2024 [cited 2025 Aug 25];205(2):323–32. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11101532/.
5. Murthy N s., Agarwal U k., Chaudhry K, Saxena S. A study on time trends in incidence of breast cancer – Indian scenario. European Journal of Cancer Care 2007;16(2):185–6.
6. Khan AQ, Touseeq M, Rehman S, Tahir M, Ashfaq M, Jaffar E, et al. Advances in breast cancer diagnosis: a comprehensive review of imaging, biosensors, and emerging wearable technologies. Front Oncol 2025;15:1587517.
7. LeBlanc G, Lee I, Carretta H, Luo Y, Sinha D, Rust G. Rural-Urban Differences in Breast Cancer Stage at Diagnosis. Womens Health Rep (New Rochelle) 2022;3(1):207–14.
8. Mehrotra R, Yadav K. Breast cancer in India: Present scenario and the challenges ahead. World J Clin Oncol 2022;13(3):209–18.
9. Stachs A, Stubert J, Reimer T, Hartmann S. Benign Breast Disease in Women. Dtsch Arztebl Int 2019;116(33–34):565–74.
10. Łukasiewicz S, Czeczelewski M, Forma A, Baj J, Sitarz R, Stanisławek A. Breast Cancer—Epidemiology, Risk Factors, Classification, Prognostic Markers, and Current Treatment Strategies—An Updated Review. Cancers (Basel) 2021;13(17):4287.
11. Dutta U, Bush N, Kalsi D, Popli P, Kapoor VK. Epidemiology of gallbladder cancer in India. Chinese Clinical Oncology 2019;8(4):33–33.
12. Agarwal G, Ramakant P. Breast Cancer Care in India: The Current Scenario and the Challenges for the Future. Breast Care (Basel) 2008;3(1):21–7.
13. Roy P. Breast cancer in young Indian women: factors, challenges in screening, and upcoming diagnostics. J Cancer Res Clin Oncol 2023;149(15):14409–27.
14. Jawade KK, Bande V. Study of spectrum and clinical profile of benign breast disease in the rural area: is there any change. International Surgery Journal 2020;7(7):2121–8.
15. Menon G, Alkabban FM, Ferguson T. Breast Cancer [Internet]. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2025 [cited 2025 Aug 26]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK482286/
16. Sharma DK, Saripilli R. Recent strategies in diagnosis, screening, prevention, and treatment of breast cancer in young women. Discov Oncol 2025;16:1532.
17. Co M, Lee A, Kwong A. Delayed presentation, diagnosis, and psychosocial aspects of male breast cancer. Cancer Med 2020;9(10):3305–9.
18. Thomas NS, Norris E. Understanding the delays in diagnosis of breast cancer in India using blogs and YouTube videos. BMC Public Health 2025;25:2792.
19. MUSTAFA N, ASHIQ K, MUSTAFA E, ALI S, ZAKA M. Awareness of breast self-examination and understanding of breast cancer treatment options among female patients of Lahore, Pakistan: a cross-sectional study. J Prev Med Hyg 2025;65(4):E538–46.
20. Kruk ME, Gage AD, Arsenault C, Jordan K, Leslie HH, Roder-DeWan S, et al. High-quality health systems in the Sustainable Development Goals era: time for a revolution. Lancet Glob Health 2018;6:e1196–252.
21. Ugargol AP, Mukherji A, Tiwari R. In search of a fix to the primary health care chasm in India: can institutionalizing a public health cadre and inducting family physicians be the answer? Lancet Reg Health Southeast Asia 2023;13:100197.
22. Costa L, Kumar R, Villarreal-Garza C, Sinha S, Saini S, Semwal J, et al. Diagnostic delays in breast cancer among young women: An emphasis on healthcare providers. Breast 2023;73:103623.
23. Jiahui L, Xingfeng L, Lijie W, Xuying L, Jinhua L, Yunxia F, et al. Breast Cancer Patients' Experiences of Coping With Financial Toxicity: A Systematic Review and Qualitative Meta-Synthesis. Psychooncology 2025;34(1):e70075.
24. Aguiar-Ibáñez R, Mbous YPV, Sharma S, Chawla E. Assessing the clinical, humanistic, and economic impact of early cancer

diagnosis: a systematic literature review. Front Oncol 2025;15:1546447.
25. Al-Azri M, AL-Kiyumi Z, Al-Bimani K, Al-Awaisi H. The Impact of a Breast Cancer Diagnosis on the Social Interaction Patterns of Young Omani Women: A Qualitative Study Approach. Curr Oncol 2024;31(12):7979–93.
26. Mangayarkarasi V, Durairaj E, Ramanathan V. Enhancing Cancer Screening and Early Diagnosis in India: Overcoming Challenges and Leveraging Emerging Technologies. Cureus 17(2):e78808.
27. Kalne PS, Kalne PS, Mehendale AM. Acknowledging the Role of Community Health Workers in Providing Essential Healthcare Services in Rural India-A Review. Cureus 14(9):e29372.
28. Cassidy CM, Choi CI, Herdman B, Kilbane TK, Lannen JF, McConnell JP, et al. Benefits of breast self-examinations for medically underserved populations: A systematic review. Womens Health (Lond) 2025;21:17455057241311400.
29. Haleem A, Javaid M, Singh RP, Suman R. Telemedicine for healthcare: Capabilities, features, barriers, and applications. Sens Int 2021;2:100117.
30. Yadav K, Cree I, Field A, Vielh P, Mehrotra R. Importance of Cytopathologic Diagnosis in Early Cancer Diagnosis in Resource-Constrained Countries. JCO Glob Oncol 2022;8:e2100337.