Section: Surgery

Original Research Article

# ETIOLOGICAL PATTERNS AND RISK FACTORS OF GYNAECOMASTIA: INSIGHTS FROM A CLINICAL STUDY AT THANJAVUR MEDICAL COLLEGE

**A Deepa[1], G Karthikeyan[1], Thivagar[1], Thawfeeq Ahamed[1]**

[1]Department of General Surgery, Thanjavur Medical College, Thanjavur – 613004, Tamil Nadu, India.

*Received* : 08/07/2025
*Received in revised form* : 25/08/2025
*Accepted* : 14/09/2025

*Keywords:*
*Gynecomastia, Etiology, Risk Factors, Webster Procedure, Alcohol, Obesity.*

Corresponding Author:
**Dr. Thawfeeq Ahamed,**
Email: thawfeeq001@gmail.com

DOI: 10.47009/jamp.2025.7.5.243

Source of Support: Nil,
Conflict of Interest: None declared

*Int J Acad Med Pharm*
2025; 7 (5); 1274-1279

## ABSTRACT

Background:
Gynecomastia, the benign proliferation of male breast glandular tissue, represents the most common breast abnormality in men. It may arise from hormonal imbalance, systemic disease, or drug effects, though many cases remain idiopathic. The condition, while benign, often causes psychological and cosmetic distress. This study aimed to identify the etiological factors, associated comorbidities, and clinical patterns of gynecomastia among patients presenting to Thanjavur Medical College. **Materials and Methods:** A prospective observational study was conducted at Thanjavur Medical College and Hospital between January 2023 and December 2023. Thirty male patients aged 18–60 years with a clinical diagnosis of gynecomastia were included. Detailed history, clinical examination, and investigations including serum testosterone levels, liver function tests, and ultrasonography were performed. The need for surgical intervention was assessed, and all relevant clinical data were analyzed statistically. **Results:** Among 30 patients studied, 30% were under 20 years of age. Gynecomastia was right-sided in 46%, left-sided in 34%, and bilateral in 20% of cases. A history of alcohol intake was reported in 46.7% of patients, while only one patient (3.3%) had a drug-related cause. Most patients (80%) had no comorbid conditions, and serum testosterone levels were within normal limits across groups. Surgical correction using the Webster procedure was performed in 20% of cases for cosmetic or symptomatic reasons. **Conclusion:** Gynecomastia in young adult males is predominantly idiopathic and frequently associated with alcohol consumption and obesity. Although testosterone levels were generally normal, increased body fat and hormonal imbalance secondary to adiposity appear to play a contributory role. Early evaluation and individualized management, including counseling and surgery when indicated, are essential for optimal outcomes.

## INTRODUCTION

The benign growth of glandular tissue in the male breast that causes an increase in breast size that may approximate the female form is known as gynecomastia. It appropriately captures the feminization of the male chest and is derived from the Greek words gynes ("woman") and mastos ("breast"). Gynecomastia can affect one or both breasts asymmetrically and can be unilateral or bilateral. With a variable prevalence that peaks during three life stages—neonatal (due to maternal estrogens), puberty (due to hormonal fluctuations), and older age (due to decreased androgen production and increased aromatization of testosterone to estrogen), it is the most prevalent breast-related condition in males.

An imbalance between the actions of estrogen and androgen, either through enhanced estrogen action, decreased androgen effect, or both, is the underlying pathophysiology. The cause of this hormonal disruption could be clinical, pharmacological, or physiological. In many instances, the ailment is deemed idiopathic because no obvious cause can be identified.

Gynecomastia is broadly classified into three types based on clinical and histological composition:

**Glandular Type:** The presence of hard, rubbery, or disc-like tissue beneath the nipple–areola complex—which is usually concentric and mobile—defines this shape. It signifies actual glandular growth, frequently brought on by elevated estrogen levels. Glandsular gynecomastia appears as a heterogeneous or hypoechoic retroareolar lump on ultrasonography. Patients sometimes complain of


ISSN (O): 2687-5365; ISSN (P): 2753-6556

sensitivity or pain in the afflicted area, especially in the early stages of proliferation.

**Fatty Type (Pseudogynecomastia or Lipomastia):** In this variation, there is no true glandular development; instead, the enlargement is entirely the result of extra subcutaneous fat. It is frequently seen in people who are overweight or obese and frequently lacks the firmness and nodularity of actual gynecomastia. Imaging shows widespread fatty infiltration without a distinct retroareolar mass in cases of pseudogynecomastia. Crucially, this kind does not react to hormonal adjustments, but it might get better with diet and lifestyle modifications.

**Mixed type:** This type, which includes different amounts of glandular and fatty tissue, is the most frequently seen in clinical practice. It often manifests as a symmetrical, occasionally sensitive, soft-to-firm augmentation of the male breast. For the best cosmetic results, surgical treatment for mixed-type gynecomastia frequently combines gland ectomy with liposuction.

Selecting the best management approach requires an understanding of the kind and quantity of tissue affected. Surgery is still the only option for persistent or severe instances, especially those involving glandular or mixed kinds, even if pharmacological therapy (such as selective estrogen receptor modulators like tamoxifen) may be helpful in the early proliferative stages.

**Psychological impact of gynecomastia:** Before any medical surgery, it is important to have reasonable expectations, and each person's expectations can differ greatly. Emotional anguish is typical in male gynecomastia patients. They may experience emotions including social disengagement, humiliation, and low self-esteem, which frequently cause them to shy away from social or public situations.

Unfortunately, this emotional strain can occasionally make people put off getting help. In order to ensure that the patient feels supported over the course of therapy, it is imperative that healthcare providers acknowledge and handle these psychological components with professionalism, empathy, and absolute secrecy.

**Anatomical Comparison Between Male and Female Breasts:** The structural composition of the male breast differs significantly from that of the female breast, both in form and function. While both sexes share the same basic anatomical components—skin, nipple–areola complex, ductal elements, and underlying fat—the extent of development varies considerably due to hormonal influences, particularly estrogen and progesterone in females.

In males, the breast remains rudimentary throughout life, composed primarily of subcutaneous fat and sparse ductal tissue with little to no lobular development. This is in stark contrast to the female breast, which undergoes extensive proliferation and differentiation under hormonal stimulation, particularly during puberty, pregnancy, and lactation. Female breasts are characterised by abundant glandular lobules and ducts, supported by a greater volume of adipose tissue and connective stroma, all of which contribute to their larger size and functional capacity for milk production.

In the ideal male chest, the breast tissue is minimal, allowing the pectoralis major muscle to define the contour. Typically, the male breast is flat with slight fullness around the nipple–areola complex, where most of the glandular tissue resides. This tissue commonly extends 0.5 to 1 inch medially and 1 to 2 inches laterally toward the axilla. The depth of glandular tissue beneath the nipple–areola complex can range from 0.25 to 2 inches, with a diameter of 1 to 5 inches. During surgical correction of gynecomastia, it is important to preserve a thin layer—approximately 0.25 to 0.33 inches—of tissue beneath the areola to maintain natural contour and reduce the risk of recurrence or depression deformity.

Unlike in females, where the breast is anchored by Cooper's ligaments and exhibits cyclical changes, the male breast remains static unless influenced by pathological conditions such as hormonal imbalances, obesity, or medication-induced changes. Understanding these anatomical distinctions is crucial when evaluating male breast conditions and planning surgical interventions such as subcutaneous mastectomy or liposuction.[1-9]

**Classification of Gynaecomastia**

**Simon Classification**

- Grade 1 small visible breast enlargement; no skin redundancy.
- Grade 2A moderate breast enlargement without skin redundancy.
- Grade 2B moderate breast enlargement with skin redundancy.
- Grade 3 marked breast enlargement with marked skin redundancy (89)

**Aims and objectives**

- The main aim of the study is to determine the various causes of Gynaecomastia and to determine the Various Risk factors of Gynaecomastia
- To Study about the drugs associated with Gynaecomastia

## MATERIALS AND METHODS

Thirty male patients who were admitted with a clinical diagnosis of gynecomastia participated in this prospective study, which was carried out at Thanjavur Medical College and Hospital. The research was conducted between January 2021 and November 2022. Every patient had a thorough clinical evaluation that included a physical examination and a thorough history collection.

All individuals had pertinent testing, including liver function tests, serum testosterone levels, and


ISSN (O): 2687-5365; ISSN (P): 2753-6556

ultrasounds (USG) of the axillary and breast regions. Each case's requirement for surgery was recorded, and the justifications for surgical intervention were carefully evaluated. The collected data was methodically documented, and the outcomes were then examined and tallied.

**Inclusion Criteria**

- All patients admitted in TMCH with a diagnosis of Gynaecomastia
- Age 18 – 60 years
- All patients in whom follow up of 3 months after discharge is feasible.

**Exclusion Criteria**

- Patients not desirous of participating in the study
- Patients under the age group of 18 years
- Patients above the age group of 60 years

**Procedure**

**Data Collection and Study Design**

Using fine-needle aspiration cytology (FNAC) records gathered over a one-year period, from January 2023 to December 2023, a retrospective observational study was carried out in the Department of Pathology at Thanjavur Medical College and Hospital. 183 FNAC reports in all were examined. These patients were referred to the General Surgery department after originally presenting with clinically palpable breast masses. They then received the necessary clinical and radiological evaluations before undergoing surgery. The postoperative histopathological examination (HPE) reports and the FNAC results of these cases, which had been tentatively classified as benign breast illnesses, were compared. Since histopathology is regarded as the gold standard for conclusive diagnosis, the HPE data were acquired from the same department. Based on the findings, distribution of benign palpable breast diseases in Thanjavur medical college is studied.

## RESULTS

In this study period of January 2023 – December 2023, total of 30 patients were studied, out of which 30% of patients are less than 20 years of age and other age groups are less than 20%. In our study, 20% patients had bilateral gynaecomastia and 46% had right and 34% had left gynaecomastia. Only 3% of patients had a history of drug intake and 97% of patients had no history of drug intake. Only 46% of patients had a history of alcohol intake and 54% of patients had no history of alcohol intake. In our study, 80% of patients doesn't have any comorbidities and Most of the patients have normal testosterone values and liver function tests. Out of 30 patients, 20% of patients underwent surgical procedure (Webster) due to pain and cosmetic reasons.

Among the 30 patients with gynaecomastia observed in the study, the age group ranged from 18 to 60 years. The youngest patient was 18 years old, and the oldest was 60 years, with a mean age of 34.6 years and a standard deviation of 14.9 years. Of these, the majority were under 20 years of age (30%), followed by 23.3% between 20–30 years. The least were between 31–40 years, comprising 10% of the cases [Table 1].

In terms of surgical intervention, 80% of the patients (n=24) did not undergo any procedure. Among those operated, 5 patients (16.7%) underwent the Webster procedure and only 1 patient (3.3%) underwent bilateral Webster procedure [Table 2].

When assessing family history, only 1 patient (3.3%) reported a family history of chronic kidney disease (CKD), while the remaining 96.7% (n=29) had no family history of illness [Table 3]. Similarly, drug history was noted only in 1 patient (3.3%), and the rest (96.7%) had no prior drug exposure that could be linked to gynaecomastia [Table 4].

History of alcohol consumption was present in 46.7% (n=14) of patients, while the remaining 53.3% (n=16) denied any history of alcohol intake [Table 5]. In evaluating comorbidities, 6 patients (20%) had associated medical conditions, while 24 patients (80%) had no comorbidity [Table 6]. Among those with comorbidities, cirrhosis was the most common, found in 3 out of 6 patients (50%), followed by CKD, pancreatitis, and hypertension, each reported in 1 patient (16.7%) respectively [Table 7].

A comparison of mean serum testosterone levels between patients with and without comorbidity was done using the unpaired 't' test. Patients with comorbidity had a mean serum testosterone level of 332 ng/ml (SD = 44.8), while those without comorbidity had a mean of 315 ng/ml (SD = 48.2). The calculated t-value was 0.795, with degrees of freedom (df) = 28, and P value = 0.433, indicating that the difference was not statistically significant [Table 8]. This suggests that the presence of comorbidity does not significantly affect testosterone levels in patients with gynaecomastia.

**Table 1: Description of Age Category of Patients with Gynaecomastia Observed in The Study (N=30)**

| S.No | Age Category | n | % |
|---|---|---|---|
| 1 | <20 years | 9 | 30 |
| 2 | 20 - 30 years | 7 | 23.3 |
| 3 | 31 - 40 years | 3 | 10 |
| 4 | 41 - 50 years | 6 | 20 |
| 5 | 51 - 60 years | 5 | 16.7 |


ISSN (O): 2687-5365; ISSN (P): 2753-6556

**Table 2: Description of Type of Procedure Performed for The Patients with Gynaecomastia in The Study (N=30)**

| S.No | Procedure | n | % |
|---|---|---|---|
| 1 | Not done | 24 | 80 |
| 2 | Webster procedure | 5 | 16.7 |
| 3 | B/L Webster procedure | 1 | 3.3 |

Data are expressed as n with %. Total N=30

**Table 3: Description of family history of illness observed in the patients with gynaecomastia (N=30)**

| S.No | Family history | n | % |
|---|---|---|---|
| 1 | CKD | 1 | 3.3 |
| 2 | Nil | 29 | 96.7 |

Data are expressed as n with %. Total N=30

**Table 4: Description of drug history observed in the patients with gynaecomastia (N=30)**

| S. No | Drug history | n | % |
|---|---|---|---|
| 1 | Yes | 1 | 3.3 |
| | Nil | 29 | 96.7 |

Data are expressed as n with %. Total N=30

Data are expressed as n with %. Total N=30. The mean age was 34.6 years with standard deviation of 14.9 The minimum age was 18 years and the maximum age was 60 years.

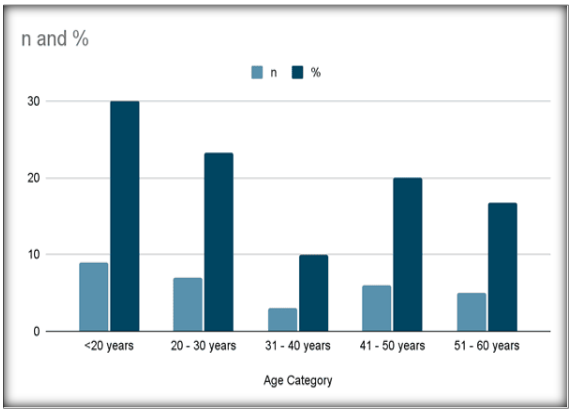


**Figure 1**

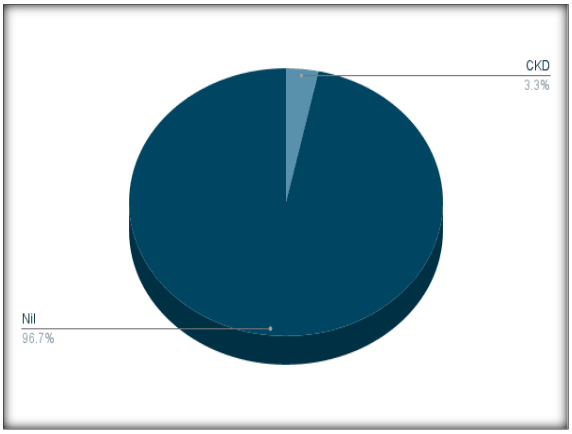


**Figure 2**

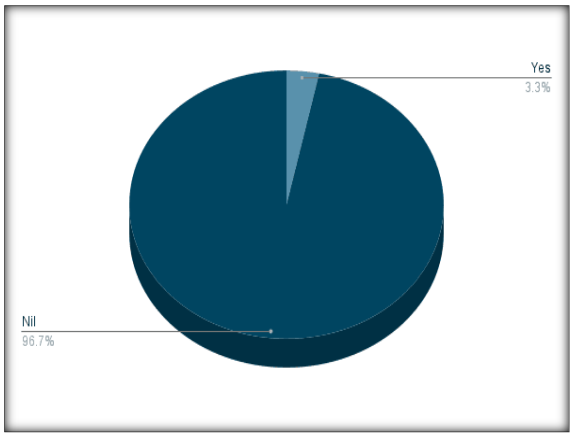


**Figure 3**

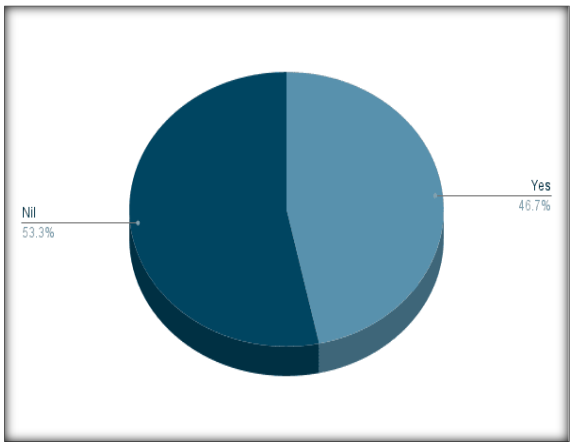


**Figure 4**


ISSN (O): 2687-5365; ISSN (P): 2753-6556

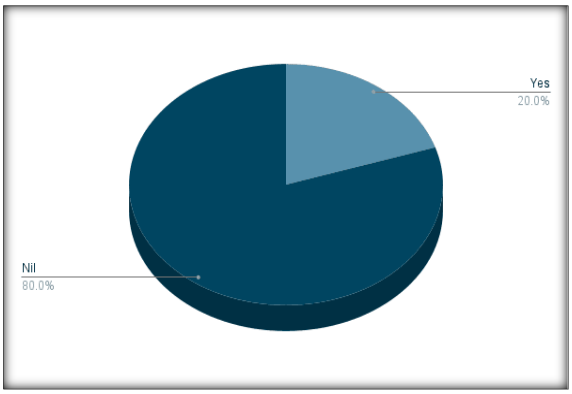


**Figure 5**

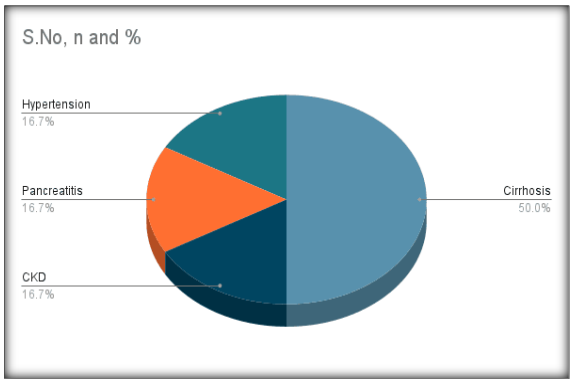


**Figure 6**

**Table 5: Description of alcoholism history observed in the patients with gynaecomastia (N=30)**

| S. No | Alcoholism | n | % |
|---|---|---|---|
| 1 | Yes | 14 | 46.7 |
| 2 | Nil | 16 | 53.3 |

Data are expressed as n with %. Total N=30

**Table 6: Description of comorbidity observed in the patients with gynaecomastia (N=30)**

| S. No | Comorbidity | n | % |
|---|---|---|---|
| 1 | Yes | 6 | 20 |
| 2 | Nil | 24 | 80 |

Data are expressed as n with %. Total N=30

**Table 7: Description of type of comorbidity observed in the patients with gynaecomastia (N=6)**

| S. No | Type of comorbidity | n | % |
|---|---|---|---|
| 1 | Cirrhosis | 3 | 50 |
| 2 | CKD | 1 | 16.7 |
| 3 | Pancreatitis | 1 | 16.7 |
| 4 | Hypertension | 1 | 16.7 |

Data are expressed as n with %. Total N=6

**Table 8: Comparison of testosterone value (ng/ml) with respect to comorbidity observed in patients with gynaecomastia**

| S. No | Parameter | Comorbidity present (n=6) | | No comorbidity (n=24) | | t-value | df | p value |
|---|---|---|---|---|---|---|---|---|
| Mean | SD | Mean | SD | Mean | SD | | | |
| 1 | Serum testosterone (ng/ml) | 332 | 44.8 | 315 | 48.2 | 0.795 | 28 | 0.433(NS) |

Data are expressed as mean with SD. Unpaired 't' test was used to compare the mean between the groups. NS = Not significant.

## DISCUSSION

In this study, we planned to evaluate the various causes of gynaecomastia and to identify the most common Etiology and risk factors for gynaecomastia. For which patients were selected by inclusion and exclusion criteria and then follow-up done for those patients and present here as a result of our study. There is no single etiology for gynecomastia; multiple factors are involved. Braunstein suggested that enhanced sensitivity of breast tissue to normal concentrations of free estrogens and androgens may play a role. Estrogen/androgen imbalance can result from an increase in free estrogens, through direct secretion from the adrenals or the testes.

## CONCLUSION

In Our study, Gynaecomastia in young adult males is mostly idiopathic in origin. Idiopathic gynaecomastia is closely associated with alcohol and obesity. Although being in the normal range, total testosterone levels are normal in these patients and also correlated with body weight and fat mass. Idiopathic gynaecomastia seems to be the result of hormonal changes associated with increased adiposity.

## REFERENCES

1. Tanaka K, Shoji T, Tominaga Y, Nakagawa H, Yamamoto D, Kawanishi H, Sakaida N, Okamura A, Hioki K. Statistical analysis of diagnostic failure of fine needle aspiration cytology (FNAC) in breast cancer. J Surg Oncol. 2001 Feb;76(2):100-5. doi: 10.1002/1096-9098(200102)76:2<100::aid-jso1019>3.0.co;2-v. PMID: 11223835.


ISSN (O): 2687-5365; ISSN (P): 2753-6556

2. Guray M, Sahin AA. Benign breast diseases: classification, diagnosis, and management. Oncologist. 2006 May;11(5):435-49. doi: 10.1634/theoncologist.11-5-435.PMID: 16720843.
3. Aslam HM, Saleem S, Shaikh HA, Shahid N and Mughal A. Clinicopathological profile of patients with breast diseases. Diag Cytopathol 2013; 8:77
4. Mendoza P, Lacambra M, Tan PH, Tse GM. Fine needle aspiration cytology of the breast: the nonmalignant categories. Patholog Res Int. 2011;2011:547580.
5. Mitra S, Dey P. Fine-needle aspiration and core biopsy in the diagnosis of breast lesions: A comparison and review of the literature. Cytojournal. 2016 Aug 31;13:18.
6. Berner A, Davidson B, Sigstad E, Risberg B. Fine-needle aspiration cytology vs. core biopsy in the diagnosis of breast lesions. Diagn Cytopathol. 2003 Dec;29(6):344-8.
7. Bailey and love's Short Practice Of surgery,21th edition.
8. Sabiston Textbook of Surgery International edition-21st edition.
9. Schwartz's Pronciples Of Surgery-10th edition.


ISSN (O): 2687-5365; ISSN (P): 2753-6556