Print ISSN: 2321-6379
Online ISSN: 2321-595X

Original Article

Spectrum of Male Breast Lesions an Institutional Perspective

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Abstract

Background: Diseases of male breast though relatively uncommon compared to diseases of female breast, do occur, but poorly studied. These range from benign lesions to malignant diseases. Benign most commonly affect young males most common is gynecomastia.

Aims and Objectives: The aim of the study was to study the spectrum of male breast diseases (BD) in relation to determine the common types of male BD in the study group and to evaluate the age distribution of different diseases.

Patients and Methods: A prospective interventional study was carried out to observe spectrum of male breast lesions from April 2019 to September 2020 in the Department of General Surgery, Government Medical College, Siddipet, Telangana, India.

Results: Fifty cases of malignant breast diseases were studied. Gynecomastia was the most common 43 cases (86%), and carcinoma 2 cases (4%) is rare. In gynecomastia, swelling of the breast was the most common presenting complaint. 2nd, 3rd, and 4th decades most commonly involved. Idiopathic gynecomastia was most common. Eighteen cases were treated conservatively and rest 25 underwent surgery. Carcinoma presented in old age, in advanced stage.

Conclusion: Benign BD are more common male breast lesions, of them gynecomastia is most common. Carcinoma male breast is rare. Gynecomastia and other benign male BD are common in young age 2nd, 3rd, and 4th decades, carcinoma seen in old age from 5th decade.

Key words: FNAC, Gynecomastia, Male breast lesions

INTRODUCTION

Diseases of the male breast are uncommon, and hence poorly studied. Further, presentation is often late due to embarrassment. Because of toxic masculinity, the stigma and misplaced shame associated with lesions of the breast in male patients can have profound psychological impact, so adequate care must be taken when approaching the insecure patient. Male breast disease is often under recognized due in part to its rarity and also to a lack of awareness. Familiarity with the salient features of the classic benign male breast conditions will allow accurate interpretation and avoid unnecessary treatment.

Access this article online

www.ijss-sn.com

Month of Submission : 10-2020
Month of Peer Review : 11-2020
Month of Acceptance : 11-2020
Month of Publishing : 12-2020

Although the overall proportion of male patients is relatively small, the number of men presenting for evaluation seems to be increasing at most centers across the world. Both benign and malignant diseases affect the male breast, with a rising incidence of male breast cancer in recent decades. The most common presentation of male patients with breast pathologies is due to gynecomastia, where cosmetic correction is sought. Approach to breast disease in male patients typically mirrors that employed in female patients. Evaluation of hormonal profile and genetic factors may be further required. Almost all male patients present with a clinical symptom such as breast pain or palpable mass. Other reported benign masses of the male breast include masses arising from the skin and subcutaneous tissues, such as lipomas, epidermal inclusion cysts are also commonly encountered. Pseudogynecomastia, which is due to excess fatty tissue deposition in the breasts, is also common, especially in patients with an elevated body mass index. Others are intraductal papilloma, pseudoangiomatous stromal hyperplasia, granular cell tumors, hemangioma, schwannoma, myofibroblastoma, and fibromatosis.

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Although male breast disease is most often benign, cancer of the vestigial male breast does occur. Male breast cancer is similar to breast cancer in females in its etiology, family history, prognosis, and treatment. Prognostic factors and current treatment regimens have been extrapolated from experiences gathered from female breast cancer.

Over the past two decades, the rate of male breast complaints increased from 0.8% to 2.4%. At present, breast cancer is one of the most infrequent cancer types in men and comprises <1% of all male cancers and 0.65% of all breast cancers. Gynecomastia and male breast cancer have many similarities and 20–40% of cases of male breast cancer have been reported to be associated with gynecomastia. A wide variation in the incidence range is seen in different geographical areas varying from 3.4 cases/100,000 man years to 0.1/100,000. There are about 370 men diagnosed each year in the UK, compared with around 48,400 cases of breast cancer in women that are about one man for every 130 women diagnosed. The female to-male breast cancer ratio is 70–100:1. The mean age at the time of diagnosis in men is 67 years, which is about 5–10 years higher than that of women, and about 50% of men have axillary nodal metastasis at the time of diagnosis.

Diseases of male breast have been underestimated and are often unmentioned in our textbooks. The literature on lesions of the male breast is voluminous, but careful studies of the subject as a whole are scant. In India, much less information is available regarding male breast disorders. Breast carcinoma is thought to be confined to females only, so most of the males do delay in seeking medical attention and have worse prognosis at the time of presentation. Furthermore, male breast malignancies suffer from underdiagnoses leading to delayed treatment. Hence, there is need of more research into this topic.

Hence, this study was conducted to analyze the spectrum of male breast diseases (BD). The purpose of this prospective study was to describe clinical and imaging features of male breast lesions and their correlations to pathologic findings following biopsies or surgery with a view toward helping to evaluate and manage breast masses in males. Here, we describe the normal male breast anatomy and present an evaluation algorithm for the male patient with breast symptoms and signs. Emphasis is placed on male breast cancer, with a discussion of its epidemiology, characteristic clinical, imaging, pathological features, prognosis, and management.

Aims and Objectives

To study the spectrum of male BD in relation to:

1. To determine the common types of male BD in the study group
2. To evaluate the age distribution of different diseases.
3. To study the modes of presentation and clinical features.
4. To evaluate management protocols of male breast disease.
5. To note the response to treatment and complications arising during follow-up.
6. To correlate clinical findings with fine-needle aspiration cytology (FNAC) and Histopathology.

The data obtained would be compared with earlier studies.

METHODOLOGY

Patients and Methods

A prospective interventional study was carried out to observe spectrum of male breast lesions from April 2019 to September 2020 in the Department of General Surgery, Government Medical College, Siddipet, Telangana, India.

The total period of study was 18 months. Cases were selected from the Outpatient Department (OPD) and from inpatients in the wards who presented with disorders of the breast. Pro forma with relevant history, clinical examination and investigations were prepared and patients were assessed.

Sample Number

A total of 50 male patients with BD were included in the study.

Type of Study

This was a prospective study.

Patients satisfying the following inclusion and exclusion criteria were enrolled in the study.

Inclusion Criteria

All male patients with BD between the ages of 14 and 75 years who attended the OPD and those admitted in the Department of General Surgery, Government Medical College, Siddipet, India, and who were willing to undergo investigations and treatment willing for follow-up were included in the study.

Exclusion Criteria

The following criteria were excluded from the study:

- All Female patients with BD.
- All male patients aged 14 years and less and above 75 years.
- History of trauma to the breast.
- Patients who are refusing any sort of treatment.

Study Done As

Screening of cases done by clinical examination in OPD and by investigations such as FNAC and when necessary, mammogram or ultrasonography (USG) was advised.

- Patients were studied and analyzed in detail, with regard to;
  - History
  - Clinical Examination
  - Routine Blood investigations
  - Hormone levels (in certain cases only)
  - FNAC
- Mammogram or USG (in certain cases only) and incisionalor excisional biopsy (in certain cases only).
- Based on the provisional diagnosis, patients were subjected to surgery or conservative management as the case required.
- Cases were again analyzed based on;
  - Operative findings
  - Histopathological findings
- Post-operative course and outcome.
- Patients were followed up for a period ranging from 1 month to 18 months to detect any recurrence.
- Unadjusted, univariate, and raw analysis of data were performed for statistical stratification.

RESULTS

A study was carried out on 50 male patients above 14 years–75 years of age with breast disease at Government Medical College, Siddipet, Telangana, India, over a period of 18 months. The data obtained were tabulated and analyzed. The following observations were made.

Age Incidence [Table 1]

The age distribution of male patients with breast disease in the study group shows that most of the patients, 34% were between 21 and 30 years of age. The study group does not have any patient above 75 years of age, only 10% of patients were above 60 years, and 16% of patients were below 20 years of age. Majority of patients 54% were aged between 21 and 40 years.

The mean age of malignant breast disease (MBD's) was found to be 36 years, median age was 30.5 years. The youngest patient in the study was 20 days old and the oldest being 65 years old. Most of the patients are in the age group of 16–30 years.

Incidence of Benign versus Malignant Diseases [Table 2]

Among 50 patients, 48 (96%) were diagnosed with benign diseases such as gynecomastia, pseudogynecomastia, abscess, lipoma, and two patients (4%) were diagnosed with MBD.

Distribution of Male Breast Lesions [Table 3]

The most common overall and benign male breast lesion in this study was gynecomastia accounting for 86% followed by other less common conditions including pseudogynecomastia 4%, lipoma 2%, sebaceous cyst 2%, and breast abscess 2%. Malignant lesion carcinoma of male breast was 4%.

Mean, Median Age, and Standard Deviation (SD) [Table 4]

The mean age of MBD's was found to be 36 years, median age was 30.5 years. With SD 16.5 showing that 68% of patients are in between 19 and 52 years (36 ± 16.5). Mean age of BBD's was 35 years, and median age was 29.5 years.

The mean age of highest incidence of gynecomastia is (34.86) 35 years, median was 28 years. With SD 16.7 showing that 68% of patients are in between 18 and 52 years (35 ± 16.5).

Table 1: Distribution according to age showing age distribution of the patients with BD

Age in years	No. of patients with BD	% of patients with BD
14–20	8	16
21–30	17	34
31–40	10	20
41–50	4	8
51–60	7	14
61–75	5	10
Total	50	100

BD: Breast diseases

Table 2: The percentage of different types of benign BD in the study group

Type of breast disease	No. of patients with BD	% of patients with BD
Benign	48	96
Malignant	2	4
Total	50	100

Table 3: Distribution of male breast lesions

Sl. no.	Type of lesion		No. of cases	Percentage
1	Gynecomastia	Benign	43	86
2	Pseudogynecomastia		2	4
3	Lipoma		1	2
4	Sebaceous Cyst		1	2
5	Abscess		1	2
6	Carcinoma	Malignant	2	4
Total			50	100

Table 4: Showing mean and median ages and SD of MBD's in years

	Total	Mean age	Median age	Standard deviation (SD)
MBD	50	36	30.5	16.5
Benign BD	48	35	29.5	
Gynecomastia	43	35	28	16.7
MBC	2	58.5	58.5	

Table 5: Presentation and management of other benign breast lesions

No	Etiology	No. of patients	Breast examination	Investigation ns	Management	
					Conservative	Surgical
1	Pseudogyne ecomastia	2	B/L Swelling, Obese	USG, FNA	2	-
2	Lipoma	1	Lump 4,	USG, FNA	-	1
3	Sebaceous cyst	1	Lump with punctum	USG, FNA	-	1
4	Abscess	1	Lump, pain, fever	USG, Aspiration	-	1
T		5			2	3

Table 6: Correlation of fine-needle cytology with histopathological diagnosis

No.	Clinical diagnosis	No. of cases	FNAC			HPE		
			Done in	Diagnosis Consistent	%	Done in	Diagnosis Consistent	%
1	Gynecomastia	43	25	23	92	25	25	100
2	Pseudogynecomastia	2	2	2	100	-	-	-
3	Lipoma	1	1	1	100	1	1	100
4	Sebaceous Cyst	1	1	1	100	1	1	100
5	Abscess	1	-	-	-	-	-	-
6	Carcinoma	2	2	2	100	2	2	100
	Total	50	31	31	-	29	29	-

Table 7: Post-operative complications

	Complication	No. of cases	Percentage
	Subcutaneous mastectomy 25 cases		
1	Wound infection	1	4
2	Seroma	1	4
3	Hematoma	0	0
	MRM 2 cases		
1	Wound Infection	0	0
2	Seroma	1	50
3	Flap Necrosis	0	0
4	Arm edema	0	0

Mean and median age of MBC was 58.5 years.

Mode of Presentation of Male BD

The most common presenting complaint noted was swelling of the breast, in 50 patients of which 26 (52%) patients presented with only swelling, 12 (24%) presented with swelling associated with pain, 6 (12%) with lump, and 2 (4%) with lump, pain.

The next common complaint was lump noted in eight patients of which six (12%) presented with only lump as a complaint, only one patient (2%) presented with ulcer.

And another one patient (2%) presented with fever pain and lump.

Presentation and Management of Other Benign Breast Lesions [Table 5]

Two patients diagnosed as pseudogynecomastia, patients are obese with high BMI, managed conservatively, with weight reduction.

- One patient with lipoma excision done.
- One patient with sebaceous cyst excision done.
- One patient with abscess, incision and drainage done.

Presentation and Management of Carcinoma Male Breast

Two cases were found to be carcinoma of the breast. These patients were aged 45 and 72 years.

One patient had presented with ulcer and lump of the breast. The other patient had presented with eccentric lump. In the latter patient, the primary tumor was traced to the right breast, which had induration and nipple retraction, which the patient had ignored.

Patient with ulcer with edge biopsy showed infiltrating ductal carcinoma, and the other with FNAC showed ductal cell carcinoma. Both showed no nodal involvement and no distant metastasis. Histopathology revealed infiltrative ductal carcinoma in both cases.

Correlation of Fine-Needle Cytology with Histopathological Diagnosis [Table 6]

In 43 patients the clinical diagnosis was gynecomastia, of them idiopathic with no cause identified in 19 patients and few age-related gynecomastias with atypical presentation total 25 were investigated with FNAC, USG. In 23 patients, FNA showed proliferation of fibroglandular tissue impression suggestive of gynecomastia; in two patients it is inconclusive. USG showed subareolar hypoechoic disk-shaped areas. Histopathological examination (HPE) after surgery in all 25 patients report was gynecomastia.

Table 8: The table comparing types of male breast diseases

Sl. no.	Lesions	Present study 2017–2019	Ramji, 2019[1]	Jain *et al.*, 2014[2]	Al-Obaidi 2011[3]
1	Gynecomastia	86%	66.66%	46.67%	82.8%
2	Pseudogynecomastia	4%	-	-	-
3	Lipoma	2%	4.76%	6.67%	4.3%
4	Sebaceous Cyst	2%	4.76%	-	-
5	Abscess	2%	4.76%	6.67%	2.15%
6	Carcinoma	4%	9.52%	16.67%	5.38%

Table 9: The table comparing age incidence of male breast lesions

Sl. No.	Age in years	Present study	Ramji	Al-Obaidi
1	Below 10	-	-	1.08%
2	10–20	16%	14.28%	27.96%
3	21–30	34%	42.85%	23.66%
4	31–40	18%	23.80%	19.35%
5	41–50	8%	9.52%	18.27%
6	51–60	14%	9.52%	8.6%
7	61–70	10%	-	1.08%

In two patients diagnosed as pseudogynecomastia FNAC showed only fibro fatty tissue and no glandular elements.

In lipoma FNAC showed mature adipocytes arranged in clusters findings consistent with HPE.

In sebaceous cyst also features on FNAC consistent with HPE.

In one case of MBC with lump FNAC showed ductal cell carcinoma, HPE infiltrating ductal cell carcinoma. Other MBC presented with ulcer investigated with edge biopsy showed infiltrating ductal carcinoma findings consistent with HPE.

Post-operative Complications [Table 7]

Out of 25 subcutaneous mastectomy surgeries, 1 patient 4% had wound infection, 1 patient 4% had seroma, and no one developed hematoma. Following MRM out of 2 patients 1 developed 50 % seroma, and no flap necrosis.

DISCUSSION

The present study was carried out among the male patients with BD attending the department of surgery at Government Medical College, a total of 50 patients were studied.

Distribution of Variety of Male BD [Table 8]

In present study, among 50 patients, 48 cases (96%) were diagnosed with benign diseases such as gynecomastia, pseudogynecomastia, abscess, lipoma, and 2 cases (4%) were diagnosed with MBD.

The most common overall and benign male breast lesion in this study was gynecomastia accounting for 86% (43 cases) followed by other less common conditions including pseudogynecomastia 4% (2 cases), lipoma 2% (1 case), sebaceous cyst 2% (1 case), and breast abscess 2% (1 case). Malignant lesion carcinoma of male breast was 4% (2 cases).

Gynecomastia (86%) was the most common MBD encountered while MBC constitute 4% of the patients.

- According to Ramji[1], the incidence of gynecomastia is 66.66% and MBC 9.52%. Lipoma is 4.76%, abscess is 4.76%, and saebaceous cyst is 4.76%.
- According to Jain *et al.*,[2] the incidence of gynecomastia is 46.67% and MBC 16.67%. Lipoma is 6.67%, and abscess is 6.67%.

Malignant breast lesions comprised 23.34% of the total. Most common malignant lesion was infiltrating ductal carcinoma (16.67%), followed by malignant epithelial tumor-Eccrine/ Breast origin (6.62) and metastatic breast lesion (3.34).

- Al-Obaidi[3] reported gynecomastia 82.8%, MBC 5.38%. Lipoma is 4.3%, and abscess is 2.15%,

Present study incidence of gynecomastia is consistent with Al-Obaidi[3].

Gill *et al.*[4] One hundred and fifty cases of male BD were diagnosed during study period.

Majority (74%) of the specimens were various benign conditions the most common being gynecomastia (88 cases out of 111).

Other benign conditions included duct ectasia (11 cases), non-specific inflammation (6 cases), fibroadenoma and hemangioma (2 cases each), and a single case of benign blue cell nevus.

Malignant tumors comprised 26% (39 cases) of the total male breast disorders, most common (82%) being infiltrating ductal carcinoma. According to all above-mentioned studies, gynecomastia is the most common.

Age Incidence [Table 9]

The age distribution of male patients with breast disease in the study group shows that most of the patients, 34%

Table 10: Comparison of mean ages and SD

Lesions	Present study 2017–2019		Ramji, 2019[1]		Jain *et al*., 2014[2]
	Mean age	SD	Mean age	SD	Mean age
MBD	36	16.5	31.5	11.6	41.5
BBD	35				28
Gynecomastia	35				42
MBC	58.5				63

Table 11: The table comparing mode of presentation of MBD

Sl. No.	Presenting complaint	Present study	Ramji[1]	Al-Obaidi[3]
1	Swelling of breast	52%	71.42%	-
2	Swelling with pain	24%	-	-
3	Lump	12%	9.52%	48%
4	Painful Lump	4%	-	38%
5	Pain only	4%	9.52%	7%
6	Ulcer	2%	4.76%	-

Table 12: The table comparing side involved in MBD

Sl. No.	Side of lesion	Present study	Ramji	Al-Obaidi
1	Right	30%	33.33%	19.36%
2	Left	44%	28.57%	59.14%
3	Bilateral	26%	38.09%	21.5%

were between 21 and 30 years of age. The study group does not have any patient above 75 years of age, only 10% of patients were above 60 years and 16% of patients were below 20 years of age.

Majority of patients 52% were aged between 21 and 40 years. The mean age was found to be 36 years.

The youngest patient in the study was 15 years old with gynecomastia and the oldest being 72 years old with carcinoma.

Most of the patients are in the age group of 14–40 years.

About 96% of all cases are benign disorders, of these 70% are represented by early and mid-reproductive age group (2nd, 3rd, and 4th decades). Majority (34%) of them belong to age group of 21–30 years with average age being 35 years.

In the present study, majority of the patients are in the age group of 21–30 years (34%) while according to Ramji peak incidence of male breast disorders is between 21 and 30 years 42.85% similar to our study.

Gynecomastia

Youngest patient in this series is 15 year old with gynecomastia, eldest being 72 year old with breast carcinoma. Thirty cases (70%) of gynecomastia occurred between age group of 14 and 40 years. The corresponding literature of Ramji reported 14 cases (66.45%); Al-Obaidi reported 59 cases (63.45%).

The mean age of highest incidence of gynecomastia is 26.25 years, majority (62%) are within the age group of 14–40 years.

In this study, youngest patient of gynecomastia is 15 year old, eldest being of 71 years. Only 12 cases were noted between the age group of 40 and 75 years.

Al-Obaidi age distribution of gynecomastia in our study varied from the highest (25.81% and 21.51%) in the 2nd and 3rd decades, respectively; to the lowest (6.45% and 12.9%) in the 6th and 5th decades, respectively.

Gill *et al*. as well as Anderson *et al*.,[5] the peak incidence of age in gynecomastia occurs during puberty, with peaking around 14 years old. More than half (51.72%) of these patients presented during the 3rd decade of life.[4]

Sazan *et al*.,[6] reported that the peak incidence of gynecomastia in the 2nd decade is 23.4%.

MBC

Among 50 cases studied, two patients were diagnosed as carcinoma, youngest patient is 45 years old, eldest being of 72 years.

MBC accounts for 4% (2 cases) in present study ages are 45 years and 72 years, Ramji found the incidence to be 9.52% (2 cases) 48 years, 55 years, Al-Obaidi reported 5.38% (5 cases) between 40 and 69 years, breast cancer is reported in the 5th decade forward of a total (5.37%) while breast cancer peak distribution is equal in the 5th and 6th decades (2.15%).

Sazan *et al*. reported carcinoma of breast is 9.7% mostly after the age of 50 years old.

Gill *et al*., most (68.4%) of the patients with malignancy presented in 5th, 6th, and 7th decades of life. The age range was 30–78 years.

Other Benign

There were two cases of pseudogynecomastia 29 years and 32 years old, rest of the cases includes 38 year old

lipoma and 52 year sebaceous cyst and 34 years old abscess.

Mean, Median Age, and SD [Table 10]

In this study, mean age of MBD's was found to be 36 years, with SD 16.5 showing that 68% of patients are in between 19 and 52 years (36 ± 16.5).

In Ramji, mean age was 31.5 years with SD 11.6. In Jain *et al.*, mean was 41.5 years.

Median age was 30.5 years in our study, in Jain *et al.* median was 40 years. Mean age of BBD's was 35 years; median age was 29.5 years, in Jain *et al.* mean age was 28 years.

The mean age of highest incidence of gynecomastia is (34.86) 35 years, median was 28 years. With SD 16.7 showing that 68% of patients are in between 18 and 52 years (35 ± 16.5).

In Jain *et al.*, mean age was 42 years.

Mean and median age of MBC was 58.5 years in Jain *et al.* mean age was 63 years. Gill *et al.*, mean age was 52.6 years.

Mode of Presentation [Table 11]

In the present study, the most common presenting complaint noted was swelling of the breast, in 50 patients of which 26 (52%) patients presented with only swelling, 12 (24%) presented with swelling associated with pain, 6 (12%) with lump, painful lump in 2 (4%), 1 (2%) with lump, pain and fever, and 1 (2%) ulcer.

The findings of the present study correlate with the findings of the study mentioned above.

The most common type of presentation of MBD was swelling of the breast constituting 52% in this study and swelling with pain 24%.

- According to Ramji states that the most common presenting symptom was swelling of the breast 15 (71.42%), followed by lump in 2 (9.52%), pain in 2 (9.52%), and ulcer in 1 (4.76%).
- According to Al-Obaidi, most common presenting symptom was painless mass 48 (51.61%), followed by painful mass in 38 (40.86%), pain in 7 (7.53%),

There were 1 case (2%) of pain, fever, lump in this study being abscess, and 1 case (2%) of ulcer being carcinoma

Gynecomastia most commonly present with painless swelling of breast, whereas the symptoms in carcinoma are painless lump and ulcer.

In this study, one patient with primary hypogonadism presented with bilateral gynecomastia, small rt testis, undescended lt testis, absent secondary sexual characteristics, tall slender personality, diagnosed as Klinefelter syndrome, and treated conservatively.

On local examination of breast, swelling is concentric and retroareolar in most cases, few four patients with age-related gynecomastia presented with eccentric lump, investigated further with USG, FNAC, managed with SCM.

Duration of Symptoms

In the present study, 82% of patients with benign presented within 12 months, and 14% of patient, presented after 1 year. About 50% of gynecomastia patients presented between 1 and 6 months, abscess patient presented within 1 month. Both of 2 carcinoma patients presented after 1year of duration.

Side Distribution [Table 12]

Most common side involved, with all the male breast disorders taken into consideration was left, which is in accordance with the study mentioned above.

Al-Obaidi study also shows that left breast (59.14%) was more commonly involved as compared to the right.

In the present study, most common side involved in gynecomastia was left 20 (40%), followed by right 12 (24%).

In carcinoma, both sides were equally involved.

In Ramji, bilateral involvement 38.09% was more common, followed by right side 33.33% and left only 28.57%.

Sazan *et al.* reported that bilateralism in 8.9% all was with gynecomastia, while different disorders involve left breast in (53.2%) and right side in (37.9%).

Gill *et al.* patients with gynecomastia revealed a slight predominance (40%) of right breast involvement; however, both breasts were affected in about 25% of the cases.

Size of Lesion

Majority of lumps (52%) in the present study averaged more than 5 cm in size. About 44% were 2–5 cm, and 4% were size <2 cm.

Benign breast lumps, especially gynecomastia is of size more than 2 cm.

In Al-Obaidi study ingestion of drugs for any cause play an important past relevant history in precipitating

gynecomastia in 42 patients (45.16%), smoking of cigarettes in 11 patients (11.83%), alcohol abuse in eight patients (8.6%); on the other hand, no important relevant history recorded in 16 patients (17.2%) involved in this study.

In our study, no important relevant history recorded in 16 patients (32%), whereas ingestion of drugs for any cause precipitating gynecomastia in 6 patients (12%), smoking of cigarettes in 6 patients (12%), and alcohol abuse in 5 patients (10%), hypogonadism secondary to Klinefelter syndrome presented with bilateral gynecomastia and undescended testis in 1 patient (2%), no tumors recorded as relevant history.

In Glass *et al*.,[7] Plourde *et al*.,[8] and Ewertz *et al*.[9] showing that persistent pubertal gynecomastia occur in 25%, drugs in 10–25%, no detectable abnormality in 25%, cirrhosis or malnutrition in 8%, primary hypogonadism in 8%, testicular tumors in 3%, secondary hypogonadism in 2%, hyperthyroidism in 1.5%, and chronic renal insufficiency in 1%.

In Al-Obaidi study 42 patients (45.16%) gave history of ingestion of different types of drugs. Hyperoestrogenization in men can be caused either by estrogen agonist drugs as digoxin, spironolactone, or estrogen hormone therapy; this group represents 11 patients (11.83%) of patients; or by testosterone target cell inhibitors which are taken by 17 patients (18.28%) of total patients; or the third group; drugs that causing hyperprolactinemia (methyldopa and phenothiazines) reported in 14 patients (15.05%); on the other hand, 51 patients (54.88%) with no history of drug association.

In our study, six patients (13.9%) gave history of ingestion of different types of drugs. Drugs are spironolactone in two patients, digoxin in one patient, amiodarone in one patient, dutasteride in one patient, and isoniazid in one patient. Persistent pubertal gynecomastia occurs in five patients 11.6%, aging related in eight patients 18.6%, no detectable abnormality in 19 patients 44.2%, cirrhosis in four patients 9.4%, and primary hypogonadism in one patient 2.3%.

Hormone Levels in patients with Gynecomastia

In this study, puberty related gynecomastia testosterone levels are normal (N) near lower limit (LL) with normal hCG, and LH. There is relative increase in E/T Ratio (Estrogen/testosterone).

In aging related gynecomastia testosterone levels are decreased, estrogen levels elevated with elevated LH and normal hCG.

In liver failure related gynecomastia estrogen levels elevated with deranged liver enzymes.

In primary hypogonadism testosterone levels are decreased, estrogen levels elevated with elevated LH and normal hCG.

In idiopathic gynecomastia, all hormone levels are in normal range.

All patients who present with gynecomastia should have serum testosterone, estradiol, LH, and hCG measured (using an assay that detects all forms of hCG). Further testing should be tailored according to the history, physical examination, and the results of these initial tests.

An elevated beta-HCG or a markedly elevated serum estradiol suggests neoplasm and a testicular ultrasound is warranted to identify a testicular tumor, keeping in mind; however, other non-testicular tumors can also secrete hCG.

A low testosterone level, with an elevated LH and normal to high estrogen level indicates primary hypogonadism.

If the history suggests Klinefelter syndrome, then a karyotype should be performed for definitive diagnosis.

Low testosterone, low LH, and normal estradiol levels indicate secondary hypogonadism, and hypothalamic or pituitary causes should be sought.

If testosterone, LH and estradiol levels are all elevated, then the diagnosis of androgen resistance should be considered.

Liver, kidney, and thyroid function should be assessed if the physical examination suggests liver failure, kidney failure, or hyperthyroidism, respectively. A chest X-ray should be done if a lung or mediastinal lesion is suspected.

Furthermore, if examination of breast tissue suggests malignancy, a biopsy should be performed.

This is of particular importance in patients with Klinefelter syndrome, who have an increased risk of breast cancer. On the other hand, if the examination finding is compatible with breast abscess, then fine-needle aspiration for microscopy, acid-fast bacilli, and culture are warranted.

Presentation of Carcinoma Breast in Males

Van Geel *et al*.[10] and Heller *et al*.[11] described that nipple involvement is a fairly early event, with retraction in 9%, discharge in 6%, and ulceration in 6%, although ulceration was separate from the nipple in half the cases, with a mean age of 60 years.

Gupta *et al*.[12] described that fixed painless hard mass with retraction ulceration, nipple discharge, and enlarged axillary lymph node are likely to be signs of malignancy.

Clinical breast examination is the key in evaluation of palpable mass in men, and it is found to be important in assessing grade of gynecomastia and further evaluation may or may not be necessary, using Hoffman Kohn scale adapted by McKinny and Simon,[5,12] because there is no convincing evidence to link gynecomastia with male breast cancer.

Ramji two cases, the diagnosis was found to be carcinoma of the breast. One patient had presented with ulcer of the breast. The other patient had presented to the hospital with pain in the back, which on evaluation revealed vertebral metastasis.

In the latter patient, the primary tumor was traced to the right breast, which had induration and nipple retraction, which the patient had ignored. These patients were aged 48 and 55 years, whereas in literature, the average age of presentation is 68 years. Both had ignored their symptoms for prolonged periods. Histopathology revealed infiltrative ductal carcinoma in both cases, with ER PR positivity and Her2 negative.

In our study, two cases were found to be carcinoma of the breast. One patient had presented with ulcer and lump of the breast. The other patient had presented with eccentric lump. In the latter patient, the primary tumor was traced to the right breast, which had induration and nipple retraction, which the patient had ignored. These patients were aged 45 and 72 years, whereas in the literature, the average age of presentation is 68 years. Both patients evaluated patient with ulcer with edge biopsy showed infiltrating ductal carcinoma, and the other with FNAC showed ductal cell carcinoma. Both showed no nodal involvement and no distant metastasis. Histopathology revealed infiltrative ductal carcinoma in both cases.

Management of Male Breast Lesions

Anderson *et al.*[5] pubertal gynecomastia often regresses spontaneously within 6 months, 75% within 2 years of onset, and 90% resolved within 3 years of onset.

USG

In our study, USG indicated in 19 idiopathic gynecomastia with no cause identified patients and few age-related gynecomastia with atypical presentation total 25 patients, similar to FNAC and in other benign lesions and in MBC.

Most of gynecomastia showed presented as generalized prominent proliferation of fibro-glandular tissue unilaterally or bilaterally, in few multiple ill-defined masses as well as retroareolar ill-defined mass.

Breast cancer, on the other hand, presented ultrasonographically with retroareolar and with eccentric ill-defined mass.

Documented that USG alone is not a reliable technique to distinguish male breast carcinoma from other etiologies, where false positive result may be seen in abscess, gynecomastia, and fat necrosis.

The main stay in diagnosis of different male breast disorders is fine-needle aspiration and/or excisional biopsy which should be the integral part of the primary assessment of breast lumps in male.

Management

In our study of 50 patients 20 patients were managed conservatively, 30 were operated.

In 43 gynecomastia patients, five patients diagnosed as pubertal gynecomastia and observed with follow-up for every 3 months, symptoms regressed spontaneously within 1 year in two patients, within 2 years in one patient, whereas two patients underwent surgery after 1 year follow-up for cosmetic purposes.

Eight patients diagnosed as gynecomastia related to aging, four managed conservatively, remaining four operated in view of suspicious lump.

Six patients diagnosed as drug related and the offending agents stopped and on follow-up all showed spontaneous regression in 1–3 months.

One patient with primary hypogonadism due to Klinefelter syndrome managed conservatively.

Four patients with alcohol abuse and liver failure features managed conservatively. In 19 patients no cause identified managed with surgery.

Surgery done in all gynecomastia patients is subcutaneous mastectomy.

Two patients diagnosed as pseudogynecomastia, patients are obese with high BMI, managed conservatively, with weight reduction.

- One patient with lipoma excision done.
- One patient with sebaceous cyst excision done.
- One patient with abscess, incision and drainage done, pus for culture and sensitivity and stain for acid-fast bacilli sent, organism was *Staphylococcus epidermidis*.
- Two patients diagnosed as carcinoma, modified radical mastectomy was done.

Comparison between clinical diagnosis, FNAC report, and HPE report of patients with MBD

Sazan *et al*. in 2008 reported gynecomastia being diagnosed by FNAC in (13.6%) and 2001 (9%) who reported that apocrine metaplasia and epithelial atypia are common finding in gynecomastia; adding that the attention should be directed toward the pattern of the cells.

All the cases of breast cancer diagnosed by HPE which reveal neoplasia and pleomorphism implicated for infiltrative ductal carcinoma 100% (5 of 5 cases).

Although there are many other subtypes for carcinoma of breast the predominant histological type of disease in all literatures is invasive ductal, which forms more than 90% of all male breast tumors.

In this study, most common MBD is gynecomastia (43 cases) according to clinical diagnosis.

The FNAC report shows that the most common MBD is gynecomastia (23 out of 25 cases).

As per HPE report gynecomastia (25 cases) is the most common MBD, followed by lipoma (1 case) and sebaceous cyst (1 case), and infiltrating ductal carcinoma (2 cases). FNAC and HPE were not done in 18 cases of gynecomastia as no indication.

In 43 patients, the clinical diagnosis was gynecomastia, of them 19 idiopathic with no cause identified patients and few age-related gynecomastias with atypical presentation total 25 patients are investigated with FNAC. In 23 patients, FNA showed proliferation of fibroglandular tissue impression suggestive of gynecomastia.

In two patients, it is inconclusive. HPE after surgery in all 25 patients report was gynecomastia.

In two patients diagnosed as pseudogynecomastia FNAC showed only fibro fatty tissue and no glandular elements.

In lipoma FNAC showed mature adipocytes arranged in clusters findings consistent with HPE.

In sebaceous cyst also features on FNAC consistent with HPE.

In one case of MBC with lump FNAC showed ductal cell carcinoma, HPE infiltrating ductal cell carcinoma. Other MBC presented with ulcer investigated with edge biopsy showed infiltrating ductal carcinoma findings consistent with HPE.

FNAC is a very useful tool in diagnosing male BD and in differentiating benign diseases from malignancy, it is a more accurate diagnostic tool as compared to clinical findings and can avoid unnecessary surgery.

However, compared to biopsy and HPE FNAC is less accurate.

Hence, recently true cut biopsy is being preferred over FNAC as more tissue is obtained for examination with diagnostic accuracy similar to HPE.

Post-operative Complications

Out of 25 subcutaneous mastectomy surgeries, 1 patient 4% had wound infection, 1 patient 4% had seroma, and no one developed hematoma.

Following MRM out of two patients one developed 50 % seroma, and no flap necrosis

CONCLUSION

A prospective interventional study was carried out to observe spectrum of male breast lesions from April 2019 to September 2020 in the Department of General Surgery, Government Medical College, Siddipet, India. The total period of study was 18 months. A total of 50 male patients with BD were included in the study.

1. Benign BD are more common male breast lesions, of them gynecomastia is most common. Carcinoma male breast is rare.
2. Gynecomastia and other benign male BD are common in young age 2nd, 3rd, and 4th decades, carcinoma seen in old age from 5th decade.
3. Common mode of presentation of gynecomastia is painless swelling of breast, carcinoma is lump with advanced features such as ulcer.
4. Gynecomastia diagnosed on basis of history, clinical features, careful systemic examination, and baseline hormonal investigations and if required cytological and imaging investigations. Managed based on etiology. Carcinoma investigated, staged, and treated similar to female breast cancer.
5. Subcutaneous mastectomy most commonly performed surgery in gynecomastia. MRM in carcinoma. Seroma most common complication.
6. FNAC along with USG useful in differentiating benign diseases from malignancy.

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How to cite this article: Srinivas D. Spectrum of Male Breast Lesions an Institutional Perspective. Int J Sci Stud 2020;8(9):81-91.

Source of Support: Nil, **Conflicts of Interest:** None declared.