

# EPIDEMIOLOGY AND CLINICAL FINDINGS OF GYNECOMASTIA IN ANDROLOGY DEPARTMENT OF DR. SOETOMO HOSPITAL, SURABAYA, INDONESIA

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## ABSTRACT

Gynecomastia is a common problem in the medical field. In contrast to worldwide data, the prevalence of gynecomastia in Indonesia is still unknown. The objective of this study was to describe the characteristics of male patients with gynecomastia in the andrology unit of Dr. Soetomo Hospital, Surabaya, Indonesia. A descriptive cross-sectional design was implemented in this study. There were 20 male patients at the department of Andrology RSUD Dr. Soetomo Surabaya within 2015-2019. The highest prevalence of gynecomastia patients in the age group was aged 30-39 years old (22.9%). In Surabaya, Indonesia, the incidence of gynecomastia is a pretty rare condition. Careful history taking and physical examination skills are needed to diagnose gynecomastia.

Keywords: Gynecomastia, Male breast enlargement, Epidemiology, Clinical findings

## 1. INTRODUCTION

Gynecomastia is defined as benign proliferation of the mammary glands in men. This condition is a common complaint that causes anxiety and discomfort and may reflect other clinically relevant illnesses [1]. Gynecomastia comes from Gynec – woman, and –mastia – breast. The prevalence of asymptomatic gynecomastia is 60%-90% in neonates, 50%-60% in adolescents, and up to 70% in men aged 50 to 69 years. The prevalence of symptomatic gynecomastia is much lower. [2] Gynecomastia is also a physiological condition in newborns, during pubertal development, and in the elderly, or is a pathological condition caused by drug abuse, systemic disease, endocrine disorders, tumors, and drugs [3]. Alterations in the synthesis or bioavailability of sex steroid hormones leading to increased circulating estrogen have been proposed as a common cause of gynecomastia [4]. Changes in the balance of sex steroid hormones can occur due to various causes, e.g., testosterone deficiency, increased aromatase activity, altered SHBG levels, or altered sex steroid signaling as in partial androgen insensitivity syndrome [4,5,6].

Identifying gynecomastia in a patient can be of great help to doctors as additional information and early signs of other underlying diseases. Therefore, breast examination is mandatory as a routine physical examination, especially in andrology. Given the absence of epidemiological data on gynecomastia in Indonesia and especially in Surabaya, the authors believe that the results of this study can provide benefits as baseline data for other related studies. By describing the demographic and clinical features of patients with gynecomastia, the authors hope to provide additional information about the characteristics of gynecomastia to increase awareness of other conditions that may underlie this condition.

## 2. MATERIAL AND METHODS

The data were collected from secondary data originating from the medical records of male patients who came to the Andrology clinic of Dr. Soetomo Hospital with gynecomastia for five years (2015-2019). The data were evaluated utilizing a cross-sectional retrospective study. The research was conducted at the Andrology Unit of Dr. Hospital. Soetomo Surabaya, Indonesia. Data collected from routine physical examinations are: height and weight; Body mass index (BMI) is calculated using the formula: body weight (kg)/height (m)<sup>2</sup>. Using the Asia Pacific guidelines for BMI, 18.5-22.9 kg/m<sup>2</sup> is considered average weight, a BMI of 23 – 24.9 kg/m<sup>2</sup> is considered overweight, and a BMI of 25 kg/m<sup>2</sup> is considered obese. Arm span and waist circumference were measured using a calibrated measuring tape. The hand's span is measured from the tip of the most extended finger to the other while maintaining the outstretched arms position. Height was measured using a wall-mounted stadiometer and weight using a calibrated analog scale while wearing light clothing.

A breast examination is carried out by the patient lying on his back with his arms folded under the head. Using the thumb and forefinger, the examiner slowly brings the fingers together from both sides of the breast. Glandular breast tissue (gynecomastia) can be distinguished from fatty breasts (lipomastia) by comparing the subareolar tissue to adjacent subcutaneous fat (as in the anterior axillary fold). Gynecomastia is felt as symmetrical, firm glandular tissue under the nipple. [7]

External genitalia examination was carried out by examining secondary sex characteristics such as the distribution of facial hair, axillary hair, and pubic hair, measuring the length of the penis using a penometer, and penis circumference. The testicular examination was performed by palpating both testes and measuring their volume with a Prader Orchidometer. Another data collected from the testicular examination is the consistency of both testes. Trained andrologists performed all examinations. Laboratory data were collected on several patients, namely FSH, LH, testosterone and prolactin hormone levels, karyotype examination data, and semen analysis results.

## 3. RESULTS

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In 5 years (2015-2019), only 20 cases of gynecomastia were found at the Andrology clinic of Dr. Soetomo Hospital, Surabaya. Table 1 shows the highest prevalence of gynecomastia patients who visited the Andrology unit dr. RSUD Soetomo Surabaya is 30-

39 years (50%), followed by 40-49 years (20%). The lowest prevalence was in the 20-29 and 50-60 age groups (10%). Most of the subjects (80%) were married, two patients were unmarried (15%), and one was divorced (5%). The patient's employment status was self-employed (60%), employee (35%), and student (5%).

**Table 1.** Sociodemographic Characteristics

Sociodemographic	Sample
<b>Gender</b>	
Male	100 % (20)
<b>Age</b>	
20-29	15 % (3)
30-39	50 % (10)
40-49	20 % (4)
50-60	15 % (3)
<b>Marital Status</b>	
Not married	15 % (3)
Married	80 % (16)
Widowed	5 % (1)
<b>Occupational Status</b>	
Employed	35 % (7)
Self-employed	60 % (12)
Student	5 % (1)

Based on the primary diagnosis of patients who visited the andrology department, gynecomastia was most commonly found in patients diagnosed with male infertility (9 patients), followed by Sexual dysfunction (4 patients), others (4 patients), and the last one was Growth and Development (4 patients). The other categories referred to are complaints that do not fall into the three categories above.

**Table 2.** Distribution by primary diagnosis

Diagnosis	Number of subject
Infertility	45 % (9)
Sexual Dysfunction	20 % (4)
Growth and development	20 % (4)
Other	15 % (3)

The average weight of all subjects was 74.45 kg, with a minimum weight of 56 kg and a maximum of 125 kg. The average height is 166.1 cm, with a minimum range of 153 cm to a maximum of 176 cm. Of all gynecomastia patients, four patients (20%) had normal BMI, six patients (28%) were overweight, and 11 patients (52%) were obese. Other anthropometric parameters recorded were waist circumference with an average of 94.5 cm and arm span with an average of 173.3 cm.

Specific andrological examinations, namely external genitalia examination, were carried out, and the results obtained an average penis length of 10.65 cm, an average penis circumference of 8.05 cm, an average testicular volume of a total of 19 subjects 11.8 ml/11.2 ml (left testicle/right testicle). Testicular consistency from 19 patients was divided into: soft in 15 patients (75%), soft in 3 patients (15%), and hard in 2 patients (10%). One patient was unwilling to undergo a testicular examination for personal reasons.

The development of secondary sex characteristics was assessed from the growth and distribution of pubic and axillary hair, and the results were that 11 patients (55%) had a dense distribution, six patients (30%) had an infrequent distribution, and two patients had no pubic and axillary hair growth.

**Table 3.** Anthropometric Characteristics

Antrophometric	Value (n)
Weight (Kg) (Mean)	74.45 kg (n=20)
Height (Cm) (Mean)	166.1 cm (n=20)
Body Mass Index	(n=20)
Normal	20 % (4)
Overweight	28 % (6)
Obese	52 % (11)
Waist Circumference (cm) (Mean)	94.5 cm (n=20)
Arm Span (cm) (Mean)	173.3 cm (n=20)
Penile Length (Cm) (Mean)	10.65 cm (n=20)
Penile Circumference (Cm) (Mean)	8.05 cm (n=20)
Testis Volume (ml) (Mean)	11.8/11.2 ml (n=19)
Testicular Consistency (Palpation)	(n = 19)

Soft	15 % (3)
Firm	75 % (15)
Hard	10 % (2)
<b>Pubes &amp; Axilla hair distribution (n = 19)</b>	
Dense	55 % (11)
Sparse	30 % (6)
None	15 % (2)

Of the 20 gynecomastia patients, only nine underwent testosterone testing, and seven underwent FSH. LH in 5 patients, prolactin in 2 patients, and karyotype in 2 patients. The average level of FSH (n=7) was 13,434 ng/dl with a minimum level of 0.86 to a maximum level of 49.85 ng/dl). The average level of LH (n=5) was 3,532 ng/dl with a minimum level of 0.06 to a maximum level of 13.34 ng/dl. The average testosterone level (n=9) was 228,585 ng/dl with a minimum level of 22.10 to a maximum level of 646 ng/dl). Among all patients (9) who underwent testosterone testing, three patients had normal testosterone levels, and six had low testosterone. Prolactin in 2 patients, with a 6,685 ng/dl mean level.

**Table 4.** Laboratory Findings

<b>Hormonal</b>	<b>Value (Mean)</b>
FSH, (n =7) (min-max)	13.434 ( 0.86-49.85) ng/dl
LH, (n =5) (min-max)	3.532 ( 0.06 – 13.34) ng/dl
Testosterone, (n =9) (min-max)	228.585 ( 22.10-646) ng/dl
Low (< 241 ng/dl )	6
Normal Testosterone	3
Prolactin,(n=2) (min-max)	6.685 ( 3.97-9.4) ng/dl
Karyotipe, (n=2)	46.XY , 46.XY

**Table 5.** Semen Analysis

<b>Semen Analysis</b>	<b>Total n = 9</b>
Azoospermia	3
Teratozoospermia	2
Severe	2
OligoAsthenoteratozoospermia	
Severe Oligoasthenozoospermia	1
Oligoasthenoterato	1

Semen analysis was performed on 9 out of 20 patients, i.e., in patients with infertility problems. The examination results showed three patients had azoospermia, two patients with teratozoospermia, two patients with severe OAT, one patient with severe OA, and one with OAT.

**Table 6.** History of Life Style factors

<b>History of Life style factors</b>		
	<b>Alcohol consumption</b>	<b>Smoking ( Tabacco )</b>
Yes	30 % (6)	50 % (10)
No	70 % (14)	50 % (10)
Both	30 % (6)	

Of the 20 patients, six patients had a history of alcohol consumption, and the remaining 14 patients had no history of alcohol consumption. The number of patients who had both of these factors was 6.

#### 4. DISCUSSION

The incidence of gynecomastia was found in only 20 patients during a 5-year retrospective investigation of medical record data at the Andrology section of Dr. Soetomo Hospital. These data suggest that gynecomastia is a relatively rare condition found in the everyday practice of andrology. Considering the cumulative number of outpatients in 5 years in the andrology department is more than 1500 patients, with the total male population in Surabaya aged 20-60 years being 740,670 people [16]. So that the prevalence of

gynecomastia in the Andrology clinic of Dr. Soetomo Hospital, Surabaya, is less than 0.1% (0.00027%). The sociodemographic data presented above shows that the largest age group is 30-39 years old, married, and in the self-employed group. These results indicate that the onset of gynecomastia appears earlier than the results published by Mieritz et al. [4], which showed the age at onset of gynecomastia in adult males was 42 years (18-91). The last peak occurred in older men (especially those aged 50-80 years) [7].

The data in Table 2 illustrates that no patient came to the RSDS andrology clinic with the chief complaint of gynecomastia. Patients diagnosed with infertility are the largest group. These patients come to the Andrology polyclinic to seek treatment regarding infertility, namely wanting to have children; then, on physical examination, it is found that gynecomastia was previously not complained of by the patient. These findings indicate that patients are unaware of their gynecomastia condition and do not complain until a doctor diagnoses them. From the anamnesis of some patients, it is known that they do not realize that the condition of breast enlargement is a medical disorder because this condition does not cause disturbances in daily activities.

The author assumes that this unconsciousness is one of the factors that cause at least men to see a doctor, so it impacts the low rate of finding the incidence of gynecomastia in Surabaya. Another possible cause of this phenomenon is the patient's sense of shame, as was the case in a study in Pakistan, where it was found that there were fewer patients who reported to the surgeon with this condition gynecomastia because of shame or guilt. This condition can be a source of embarrassment for some people because it affects appearance [8]. Another possible cause is that the etiology of gynecomastia is quite broad; it can confuse patients to deciding on which part they should consult about their condition. One patient from another category group presented to the andrology department with gynecomastia. Instead of complaining about gynecomastia, the patient comes to maintain his gynecomastia. This patient is a transgender patient who wants to maintain her feminine appearance.

The prevalence of gynecomastia described by Ashraf T Soliman et al. appears to be greater in obese adolescents. Sixty-nine patients were identified by body mass index (BMI) criteria; 5% were obese, 16% were overweight, and 33% were normal weight [9]. Our findings align with the fact that 52% of patients were obese, 28% were overweight, and 20% had normal BMI. These results suggest that gynecomastia is associated with an increase in BMI. However, there are conflicting reports in the literature regarding the association of BMI with gynecomastia. While some studies show that boys with gynecomastia are heavier [10-12], other studies have also revealed that boys with gynecomastia at puberty have shorter stature.

Primary and secondary sexual characteristics data obtained showed that most of the patients showed normal growth and development, which means that whatever the etiology of the gynecomastia in these patients, the onset of gynecomastia in most patients started after puberty. Among the 20 patients, only two patients had a genetic etiology, which did not show any signs of developing sexual characteristics. It is thought that a genetic etiology causes primary testicular failure, which affects the regulation of sex hormones, which eventually leads to a delay in the development of sexual characteristics and causes gynecomastia itself.

The characteristics of the external genitalia and the volume of the testes are indicators that can give us quite a lot of information about the sexual hormone status of a man. Normal volume testes are assumed to have normal functions, namely spermatogenesis, and steroidogenesis. In their research, Sakamoto et al. have proven this theory, which concluded that testicular volume as measured by ultrasonography or Prader orchidometry is significantly correlated with testicular function. [15]

Normal steroidogenesis affects the normal production of the hormone testosterone, which should promote the development of secondary sex characteristics. Our results showed that most patients had normal testicular volume and typical secondary sex characteristics. However, we did not have sufficient data on the hormonal status of all patients, so we cannot explain the pathways by which testicular volume and secondary sex characteristics affect gynecomastia. Philip Kumanov, in his research, did not find a relationship between gynecomastia and penis size and was weakly correlated with testicular volume. However, these conflicting research reports caused considerable controversy regarding the prevalence of gynecomastia and its relationship to body weight, height, body mass index (BMI), and testicular volume.

Data from laboratory tests on nine patients out of 20 patients showed an average testosterone level of 228,585 ng/dl. Our findings showed that 45% of patients with gynecomastia were due to low testosterone levels, and the hormonal status of the remaining 55% was not evaluated. Therefore, we have not been able to clarify the theory that supports that gynecomastia is caused by changes in the balance of sex steroids. [5] An external factor that has been proven as a risk factor for the gynecomastia is alcohol consumption. In contrast, there is no evidence regarding the relationship between the incidence of gynecomastia and smoking. This study cannot prove this fact because most of these gynecomastia patients do not consume alcohol and smoke tobacco.

Data regarding the involvement of both breasts or one breast and the degree of gynecomastia are not well documented in the medical records. These data are essential because they can provide additional information about the nature of gynecomastia in specific groups and can be considered for further diagnostic or therapeutic approaches for clinicians.

## 5. CONCLUSION

In Indonesia, especially in Surabaya, gynecomastia is a rare case in less than 0.1% of the male population in Surabaya. Incidence increases in the age group of 30-39 years and patients with sex hormonal disorders. An increase in BMI appears to have a negative impact on the incidence of gynecomastia. Patient awareness of this condition should be increased and promoted to early diagnosis and management. To diagnose gynecomastia, in-depth history and physical examination skills are briefly required. Laboratory examination, especially a complete examination of sex hormones, is an invaluable clue to determining the pathomechanism of gynecomastia.

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