



“ β -hCG Expression in Patients with Benign and Malignant Cystic Breast Diseases”

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KEYWORDS

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ABSTRACT:

Background: The most common benign breast lesion in women has been identified for over 150 years as cystic disease of the breast. The relationship between gross cysts and breast cancer is a subject of debate and confusion, but new research indicates that a multidisciplinary study of gross cystic breast disease (GCBD) may be a useful tool for forecasting the complex gross cyst pathology's natural course. Breast fibrocystic disease is believed to be the outcome of an improper histologic reaction to altered hormone levels. It is arguable if this is a legitimate pathophysiologic condition.

Materials & Methods: This study was conducted at private medical college and hospital over a period of 12 months from January 2023 to December 2023. It is a prospective study. Data collected from patients admitted in General surgery department for benign and malignant cystic breast lumps. A total sample of 50 patients.

Results: The most prevalent age bracket is "21 – 30 years," comprising 44% of the total individuals. Following closely behind is the age group "31 – 40 years," representing 30% of the sample. "Benign" has a frequency of 43, which corresponds to 86% of the total sample size. The "Malignant" has a frequency of 7, accounting for 14% of the total sample size.

Conclusion: The findings indicate that elevated levels of breast cystic fluid β -hCG are protective against benign breast cystic illness and that BCF β -hCG levels are helpful in the identification of benign breast cysts.



INTRODUCTION:

The most common benign breast lesion in women has been identified for over 150 years as cystic disease of the breast. The relationship between gross cysts and breast cancer is a subject of debate and confusion, but new research indicates that a multidisciplinary study of gross cystic breast disease (GCBD) may be a useful tool for forecasting the complex gross cyst pathology's natural course. Breast fibrocystic disease is believed to be the outcome of an improper histologic reaction to altered hormone levels. It is arguable if this is a legitimate pathophysiologic condition.

Although serous fluid-filled gross breast cysts are almost always benign, those who have them are four times more likely to experience breast cancer. The two benign breast diseases that are most interesting from a clinical standpoint are those that occur during specific stages of a woman's maturity or have a connection to neoplasia. Gross cysts are more common in the perimenopausal years, but micronodular fibrocystic illness with ill-defined lumpiness is very common in young women during pubertal and early reproductive life. Breast cyst fluid (BCF) biochemical composition ought to mirror the endocrine environment of the breast. In fact, a plethora of information regarding the hormonal makeup of fluid aspirated from breast cysts has been gathered, which may help to clarify the pathophysiology of benign breast disease and its potential connection to mammary cancer. This study is planned to find 1. To examine how β -hCG is expressed in individuals with benign and malignant cystic breast illnesses. 2. To evaluate β -hCG's value in the diagnosis of benign and breast lumps with cystic malignancy.

METHODOLOGY:

This study was conducted at private medical college and hospital over a period of 12 months from January 2023 to December 2023. It is a prospective study. Data collected from patients admitted in General surgery department for benign and malignant cystic breast lumps. A total sample of 50 patients.

Inclusion criteria: Female patients in age group 15 to 49 yrs 2. Patients with Breast cysts 3. Patients with no other co morbidities 4. Patients consented for inclusion in the study.

Exclusion criteria: 1. Pregnant patients 2. Patients with ectopic pregnancy, trophoblastic disease, and phantom β hCG 3. Patients with Breast abscess, mastitis, mastalgia 4. Patients with Congenital breast disorders 5. Patients with Non cystic lesions of breast

Ethical clearance was obtained from the Institutional Ethical Committee. Prior to conducting the study. Informed consent was obtained. Material used for the study are Proforma containing patient history, clinical examination, investigations including FNAC • Informed consent forms • Ultrasonogram and mammogram • USG guided aspirate of the breast cyst fluid transferred to a sterile container for transport.

This investigation was carried out. Following the acquisition of consent from patients who meet the study's inclusion requirements, clinical evaluations and required investigations are carried out. In order to rule out non-cystic lesions, mastitis, and breast abscess, a clinical breast examination is performed for breast lumps. Mammograms and ultrasounds are performed to detect cystic breast masses. 50



individuals who meet the inclusion criteria and range in age from 15 to 49 are prospectively studied when consent is obtained.

The collected data was entered in Microsoft Excel. Coding of the variables was done. Analysis was done using SPSS software (Version 27, IBM). Descriptive statistics was used. Association between categorical test. P value less than 0.5 was considered significant.

RESULT

Throughout the span of a year, a research initiative took place at a private medical college and hospital, focusing on patients with benign

Table 1: Age distribution

Variable	Frequency	Percentage
< 20 years	7	14%
21 – 30 years	22	44%
31 – 40 years	15	30%
41 – 50 years	6	12%
Total	50	100%

Each age group is categorized into "< 20 years," "21 – 30 years," "31 – 40 years," and "41 – 50 years," with corresponding frequencies and percentages. Among the sample, the most prevalent age bracket is "21 – 30 years," comprising 44% of the total individuals. Following closely behind is the age group "31

and malignant breast cysts. The study enrolled fifty patients who met the predefined criteria and were admitted to different surgical wards. This research, a prospective study involving fifty participants, encompassed a comprehensive gathering and synthesis of various data points, including patient age, BCF β -hCG levels, and the FNAC report concerning the cystic breast lump. Multiple facets were investigated, such as the distribution of age, diagnosis frequency, variability in β -hCG levels, and the proportion of β -hCG level escalations.

– 40 years," representing 30% of the sample. Meanwhile, individuals aged "< 20 years" constitute 14% of the total, and those between "41 – 50 years" make up the remaining 12%. These percentages add up to 100%, indicating a comprehensive coverage of the sample's age distribution

Table 2: Diagnosis

Variable	Frequency	Percentage
Benign	43	86%
Malignant	7	14%
Total	50	100%

The category "Benign" has a frequency of 43, which corresponds to 86% of the total sample size. The category "Malignant" has a frequency of 7, accounting for 14% of the total sample size.

**Table 3: β-hCG Variations**

Variable	Frequency	Percentage
Decreased	14	28%
Increased	36	72%
Total	50	100%

The variable is classified into two distinct categories: "Decreased" and "Increased." The breakdown reveals that among the sample, the category "Increased" dominates significantly, accounting for 36 cases or 72% of the total sample. Conversely, the category "Decreased"

encompasses 14 cases, constituting 28% of the sample. The total percentage sums up to 100%, indicating that all observations within the sample are accounted for across these two categories.

Table 4: Association between Diagnosis with β-hCG

Variable	Decreased	Increased	Pvalue
Benign	53%	81.2%	0.001*
Malignant	47%	18.8%	0.00*

In the "Benign" category, 53% experienced a decrease and 81.2% experienced an increase, with a significant p-value of 0.001. Conversely, in the "Malignant" category, 47% experienced a decrease and only 18.8% experienced an increase, with an even lower p-value of 0.00. These findings suggest a strong association between the category (benign or malignant) and the changes observed which is statistically significant.

DISCUSSION

Over the course of a year, this study was carried out in a private medical college and hospital. Fifty patients who met the inclusion criteria for this study and had benign and malignant breast cysts were admitted to different surgical wards. This is a 50-patient prospective study. A variety of information is gathered and combined,

including the patient's age, BCF β-hCG levels, and the FNAC report regarding the cystic breast lump. Numerous characteristics are examined, including age distribution, frequency of diagnosis, variability in β-hCG levels, and percentage of β-hCG level increase.

Although it is now thought that practically all of the body's epithelial cells have the capacity to produce hCG, this ability is inhibited during normal physiological conditions and is only expressed by the placenta's syncytiotrophoblast. Since most cases had negative serum levels, the presence of immunoactive β-hCG in BCF clearly suggests de novo synthesis by the cyst lining epithelial cells. These cells have lost their ability to suppress the hCG production that is normal for all cells, just like those of some neoplasms.



The current study examined cystic breast lumps and BCF β -hCG levels in relation to the pathological diagnosis. The age group of 21 to 30 years old had the highest incidence of benign cystic breast disease, whereas In a study conducted by Echejoh et al., it was prevalent in the age range of 31 to 40 years. Maximum incidence of benign fibrocystic disease was observed by Amr et al. in individuals aged 31–35. Maximum number of instances in the 18–40 age range was noted by Malik et al.

Every patient in the current study who had benign cystic breast disease had a breast lump when they first arrived. In the majority of benign proliferative breast lesions, Kulkarni et al. found lumps as the primary presenting symptom, which is consistent with this research.

In present study, 43 out of 50 patients with cystic breast lump had benign pathology constituting about 90% of the study population whereas only 7 patients has malignant pathology. This implies most cystic breast diseases are benign. However, 4 out of the 5 patients with malignant pathology are in the age group 40 – 49 yrs implying that cystic breast lump with malignant pathology is common in women over 40yrs.

Conclusion:

It appears that benign breast cysts are not latent repositories accumulating fluid discharges, but rather functioning endocrine organs. Regarded primarily as a target organ, the breast appears to be able to accumulate, metabolise, and likely synthesise certain peptide-like and steroid hormones, such as thyroid stimulating hormone (TSH), luteinizing hormone (LH), follicle stimulating hormone (FSH), prolactin (PRL), and β -human chorionic gonadotropin (β -hCG).

In the current investigation, elevated β -hCG levels were found in approximately 86% of individuals with benign cystic breast disease. Less often occurring malignant breast cysts have been seen; yet, BCF β -hCG levels were not elevated. Almost invariably, breast cysts with elevated BCF β -hCG levels are benign. This indicates a function for BCF β -hCG in the diagnosis of benign breast cysts ($P < .01$).

The findings indicate that elevated levels of breast cystic fluid β -hCG are protective against benign breast cystic illness and that BCF β -hCG levels are helpful in the identification of benign breast cysts.

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