National Journal of Advanced Research
www.allnationaljournal.com
ISSN: 2455-216X
Received: 25-02-2021, Accepted: 25-03-2021, Published: 13-05-2021
Volume 7, Issue 2, 2021, Page No. 05-07

Relation of prolactin hormone with fibroadenosis and fibrocystic disease in breast

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Abstract
Background: Fibrocystic and fibroadenosis are the most common conditions that can be seen. Almost 40% of 20 to 50 years old women due to sensitivity to estrogen and progesterone hormone. Prolactin hormone play an important role in the proliferation and differentiation of normal breast epithelium and milk production from breast.
Objectives: The study mainly aimed to evaluate the association between the level of the prolactin hormone and fibrocystic, fibroadenosis diagnosed by ultra sound in comparison with other group of same symptoms having normal ultra sound.
Materials and Methods: Total 100 patients at 20 to 50 years old women. 83 of them having fibroadenosis and 17 of them having fibrocystic breast changes, baseline by ultra sound. Also 100 Patients at same age were complained of same symptoms with normal ultra sound reports. Two groups send for estimation of serum prolactin hormone level.
Results: The results show that no strong relation between prolactin hormone and fibrocystic or fibroadenosis of breast. Abnormal prolactin level in 37.3% of fibroadenosis and 29.4% of fibrocystic changes,while normal level 62.7% and 70.6% respectively,in comparison with control group show 98% was normal level which was significant high. Also show high prevalence of fibroadenosis at age of 17-36 years old and fibrocystic at age 37-45 years old. There was relation between the changes with positive family history of breast cancer. The changes can affect one breast or both at same time.
Conclusion: The study concludes that there was no strong relation between prolactin hormonal level and fibrocystic and fibroadenosis changes of breast and there was relation of changes with positive family history of breast cancer.

Keywords: breast, hormon, cancer

Introduction

Mammary glands have physical as well as psychological importance in human female [1]. Fibrocystic and fibroadenosis changes is the most common breast lesion,this term refers to histology image of fibrosis,cystic formation,epithelial hyperplasia,adenosis and apocrine metaplasia [2] other name is Cystic mastopathy or Chronic cystic disease, Masoplsia [3]. Some experts estimate that 50% of women age 20-50 year experience fibrocystic breast changes. Although the exact pathogenesis is not clear [2] people who develop fibrocystic changes may be more sensitive to hormonal fluctuation during menstrual cycle particularly estrogen predominance over progesterone [3] Fibrocystic breast disease tend to affect people who are pre menopause, some people who take estrogen replacement therapy after menopause also develop fibrocystic changes [4]. Drinking alcohol, caffeine are contributes to severity of fibrocystic changes. Fibrocystic and fibroadenosis breast changes encompass a wide variety of symptoms including breast tenderness, heaviness, discomfort, sudden appearance or disappearance of palpable benign masses in breast or lumpy free moving masses in breast [5]. Some women with fibrocystic breasts experience a greenish or dark brown nipple discharge that is free of blood [5]. In the majority of cases no treatment is needed once your doctor has determined that your breast changes are not due to cancer [6] so lumpy breast or have rope –like bump according to American Cancer Society having breast disease does not increase the chance of person to develop breast cancer [7]. However 5% of fibrocystic have atypical hyperplasia which is associated with a fivefold increase of risk of cancer of course if they have a positive family history of breast cancer [8]. Ultrasound and mammography may be the preferred method for diagnosis when testing reveal that a lump may be fluid filled cyst, some times a doctor will choose to do a fine needle aspiration cytology if a doctor still is not certain that cancer cannot be ruled out as a cause of lump biopsy may be necessary [5]. Prolactin hormone play a very important rule in proliferation and differentiation of normal breast epithelium [9]. Prolactin hormone is 198-amino acid poly peptide that is secreted by lactotroph cells in anterior pituitary gland and in the main trophic factor for milk production by the breast [4]. Dopamine being the major inhibitory factor for prolactin secretion, hyper-prolactinemia is the most common hypothalamic pituitary disorder it also induced by neuroleptic dopamine blockers. Atidepressants and estrogen,hypothalamic pituitary disease, hypothyroidism, chronic renal failure and liver cirrhosis, pregnancy and lactation must be excluded [10]. Serum prolactin level may be be increased in patients with antidepressant and breast pain and other benign breast diseases including fibrocystic disease andfibro adenosis [11]. It is suggested that patients with benign breast lump and pain should be screened for clinical or laboratory evidence of hyperprolactinemia [12].

Materials and Method

The study was conducted at the specialized breast clinic of Al-Khansaa teaching hospital in Mosul city from period of October 2019 to June 2020.The study design was case control. The studied population includes 100women of reproductive age (pre menopause) who had problems such as breast pain feeling of heaviness,lump and nipple discharge, in whose base line ultrasound breast fibrocystic

and fibroadenosis changes were reported, also 100 patients of same symptoms taken of normal ultrasonographic reports.In this study a questionnaire was developed for patients containing data including ;no.,age, menarche, marital status(single, married), menstrual cycle (regular, irregular), lactating now side (right, left, both), ultrasound finding (fibroadenosis, fibrocystic), history of previous surgical operation in the breast (yes or no), family history of breast cancer (yes, no) serum PRL level. All patients were sent for ultrasonography with high frequency probe and reveled fibrocystic and fibroadenosis. Patients with recent history of pregnancy lactation, hormonal intake or clinical radiological or histopathological evidence of inflammatory or malignant lesion were not included.

Laboratory analysis

Serum prolactin test, requires a sample of blood that should be drawn in the morning at least two hours after patient awake as sample drawn earlier may show sleep induced peak level [15], no restriction of food, fluid and physical activity is required, but the patient should be relaxed half an hour before the test [13], three ml of venous blood was collected from patient by vein puncture centrifuged to obtain serum and stored at freezing until analysis serum sample were tested for PRL by electro chi-humin sicene immunoassay by the Cobas e immunoassay analyzers system [16]. Reference ranges vary from laboratory to laboratory but are generally within following range adult male 0-20 ng / ml, adult female 0-20 ng/ml, pregnant female 200-400 ng/ml [14].

Statistical analysis

The study data are presented as numbers, percentages, mean, SD stander deviation chi _ square (x – test) were used to find statistical association. p-value < 0.00 used as significant statistical association.

Results

In this study we reveled that serum prolactin has no strong relation with cases of fibroadenosis and fibrocystic only 37.3% has abnormal prolactin and 52% has normal level, in fibrocystic also only 29.4% has abnormal prolactin and 70% normal while in control groups 98% has normal prolactin, so it means significant difference between the cases and control groups as shown in table no (1).

Table 1: Serum prolactin level in women with fibroadenosis and fibrocystic and in control groups.

Prolactin	Fibroadenosis	Fibrocystic	Control	P–value*
	No. (%)	No. (%)	No. (%)	
Abnormal	31(37.3)	5(29.4)	2(2.0)	0.000
Normal	52(62.7)	12(70.6)	98(98.0)	
Total	83(100.0)	17(100.0)	100(100.0)	

*chi _ square test was used

the most prevalence of fibroadenosis at the 17 _ 36 years which is about 78.4%, In fibrocystic the age between 37 _ 45 years was more common about 47%, but there was no significant difference of age in control groups as shown in Table 2:.

Table 2: age groups in woman with fibroadenosis, fibrocystic and control groups

Age Group (years)	Fibroadenosis	Fibrocystic	control	P – value*
	No. (%)	No. (%)	No. (%)	
17 - 25	33(39.8)	4(23.5)	37(37.0)	
26 - 36	32(38.6)	5(29.4)	34(34.0)	0.295
37 - 45	18(21.7)	8(47.1)	29(29.0)	
Total	83(100.0)	17(100.0)	100(100.0)	

there was no significant difference at the affected side by the fibroadenosis or fibrocystic disease and in control groups as shown in Table no (3).

Table 3: affected side of the fibroadenosis, fibrocystic and control groups.

Side of lesion	Fibroadenosis	Fibrocystic	control	P – value*
	No. (%)	No. (%)	No. (%)	
Left	22(81.5)	5(18.5)	27(27.0)	
Right	15(38.3)	3(16.7)	18(18.0)	0.000
Both	46(83.6)	8(16.4)	55(55.0)	
Total	83(100.0)	17(100.0)	100(100.0)	

there was a significant difference in the positive family history of breast cancer between cases of fibroadenosis, or fibrocystic and the control groups but there was no significant association in age of menarche between cases and control groups as shown in Table no (4):.

Table 4: family history, age of menarche in both case and control groups.

	Fibroadenosis (n=83)	Fibrocystic (n=17)	Control N=(100)	P – value*
	No. (%)	No. (%)	No. (%)	
Family history of breast cancer	8(9.6)	3(17.6)	2(2.0)	0.017
Age of menarche MEAN +-SD	12.46+-0.92	12.41+-0.62	12.43+-0.91	0.969

there was no significant relation in the state of menstrual cycle between cases and control groups, most of them show regular cycle as shown in Table no. (5).

Table 5: regularity of the cycle in case and control groups.

Cycle	Fibroadenosis	Fibrocystic	control	P – value*
	No. (%)	No. (%)	No. (%)	
Irregular	16(19.3)	2(11.8)	23(23.0)	
Regular	67(80.7)	15(88.2)	77(77.0)	0.534
Total	83(100.0)	17(100.0)	100(100.0)	

Discussion

This study is the first study on prolactin hormone level in women with fibro adenosis or fibrocystic in our locality,we studied 100 women among them there were 83 of them that had fibroadenosis and the other 17 had fibrocystic diseases at breast center clinic in AL-Khansaa teaching hospital in Mosul city from October 2019June 2020. It shows serum PRL level has no relation with disease, it was increased only in 37.3 % of cases of fibroadenosis and 29.4% in cases of fibrocystic, while normal level is about 62.7%,70.6% respectively, but only 2% having hyperprolactinemia in control group which is statistically significant and 98%was

normal.so no strong relation between fibroadenosis and fibrocystic diseas and prolactin hormone,but there was significantwith control groups. In agreement with finding observed by other investigators [17] they found no strong association was seen between PRL hormone and fibrocystic, other study disagree that suggest that PRL hypersensistivity is likely an etiological factor in some condition of fibroadenosis and fibrocystic disease (18). So PRL hormone appear not to be an important determinant role in those disease study show a high prevalence rate of fibroadenosis between age 17 – 36 years about 78.4 % while in fibrocystic common age group between 37 – 45 years (47%). Also study show that fibroadenosis or fibrocystic can affect any side (Right. or left breast in about 83.6% with no significant difference. Women with fibroadenosis or fibrocystic have a positive family history of breast cancer in about 9.6%,17.6% respectively while only 2%in control group especially in first degree relative(mother,sister, daughter,father,brother) with significant difference. There was no significant difference in age of menarche and the state of the cycle, it shows 80,7% and 88% having regular cycle in fibroadenosis and fibrocystic in comparison with the control groups 77% was regular cycle.

Conclusions

The study show no relation between PRL hormone and fibroadenosis or fibrocystic but there was significant statisticaly in compare with control groups. Also study show a high prevalence of the fibroadenosis at 17 – 35 years old, fibrocystic at age 37 – 45 years and there was relation between fibroadenosis and fibrocystie disease of breast with the positive family history of breast cancer.

Recommendation

We recommended for study of the serum PRL hormone level in women with cancer of breast. The result show that serum prolactin level was high in 37.3% in fibroadenosis and 29.4% in cases of fibrocystic disease, while normal level about 62.7%, 70.6% respectively. In comparison with control groups show 98% was normal. So no strong relation between prolactin H. and fibroadenosis or fibrocystic disease but there was significant difference with control groups. The most prevalence of fibro adenosis was between 17- 36 years age groups (78.4%) and in fibrocystic affect 37- 45 years age groups in about 47.1% and less common among other age groups There was significant difference in relation of positive family history of breast cancer between cases and control groups but there was no significant difference on the side affected in cases and control groups also age of menarche and menstrual cycle state have no significant role in cases and control groups.

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