Study the role of lipid profile in the incidence of benign breast tumors in the women

Ms.c Jenan Mahdi Chani BS.c Shaymaa,Mhammed

Department Of Biology, faculty of Sciaence , Kufa University ,Najaf, Iraq
Corresponding Author: Email- jenanm.alkhalifa@Uokufa.edu.iq

Abstract: This study is designed to investigate the role of cholesterol, high density lipoprotein HDL, low density lipoprotein LDL and triglycerides TG in the increased incidence of benign breast tumors among women.
This study involved 80 women divided into two groups: control group which including 40 healthy women and benign group which containing 40 women with benign breast tumors diagnosed by the means of fine needle aspiration and ultrasound.
The age of women in benign group ranging from under 20- 60 years, blood sample was collected from each women for measuring lipid profile (cholesterol, high density lipoprotein HDL, low density lipoprotein LDL and triglycerides TG).

The results explained that benign breast tumors was more common in women with interval age 20-30 years. The results also revealed that the age at menarche and abortion were significantly P≤ 0.05 associated with increased risk of benign breast tumors .

The results clarify a significant P≤ 0.05 increasing in the levels of cholesterol, high density lipoprotein HDL and triglycerides TG) in women in benign group in compared with healthy women, reflecting that increased lipid profile may contribute in increasing risk of benign breast tumors. Finally the statistical analysis of this study was showed that obesity reflecting by measuring body mass index BMI significantly decreased in women with benign breast tumors in comparison with control group, the matter that explain benign breast tumors less incidence in obsess women.

Index Terms-

Introduction

Breast is a dynamic organ which undergoes cyclical changes throughout a woman's reproductive life. [1] The mammary gland is one of the most complex endocrine organs. Its growth, secretory differentiation, lactogenesis and galactopoesis are the interplay of ovarian and adrenal steroids, pituitary, thyroid and pancreatic hormones.[2] The term "benign breast diseases" encompasses a heterogeneous group of lesions that may present a wide range of symptoms or may be detected as incidental microscopic findings. The incidence of benign breast lesions begins to rise during the second decade of life and peaks in the fourth and fifth decades, as opposed to malignant diseases, for which the incidence continues to increase after menopause, although at a less rapid pace[3] Once a diagnosis of BBD has been made, risk factors for breast cancer are assessed based on the histologic classification of a benign breast lesion and a family history of breast cancer.[4] Benign breast disease deserves attention because of its high prevalence, its impact on women's quality of life, and, for some histologic types, its cancerous potential. Identification of risk factors for benign breast disease could improve our understanding of its etiology and pathogenesis and help to define preventive strategies.[5] It is impossible to know whether a breast lump is cancerous without performing imaging examinations and/or a biopsy and/or Fine-needle aspiration cytology (FNAC). FNAC is part of the triple assessment for the diagnosis of breast lesions.[6] Triple assessment, which includes clinical examination, imaging and histopathological examination, is now considered the gold standard approach to the diagnosis of all breast lumps [7]

2.Material and methods

Serum was obtained from 40 normal healthy women which don't undergo any breast diseases or cardiovascular diseases or renal diseases and non-smoking and from 40 women with benign breast diseases diagnosed either clinically by a surgeon or by other diagnostic methods as ultra sound ,mammography and fine needle aspiration their ages ranging from 20 to 50 years . Fasting venous blood was drawn and serum was separated and analyzed within 6 hours after its separation. The following parameters were analyzed with each sample.
(1) Total cholesterol (2) High density lipoprotein HDL (3) Low density lipoprotein LDL (4) Triglycerides TG
The investigations were done by the method of [8]The estimations were done using ready made kits(Spinreact, Spain)

2.1 Measurement of body mass index

Weight was measured to nearer 0.1 Kg and height was measured to nearer 0.5 cm by using the instrument for measurement of weight and height(DETECTOMEDIC). Body mass index(BMI) was calculated as follows:

$BMI=W/H^2$ W: Weight in kilogram , H^2: Height square in meter [9].

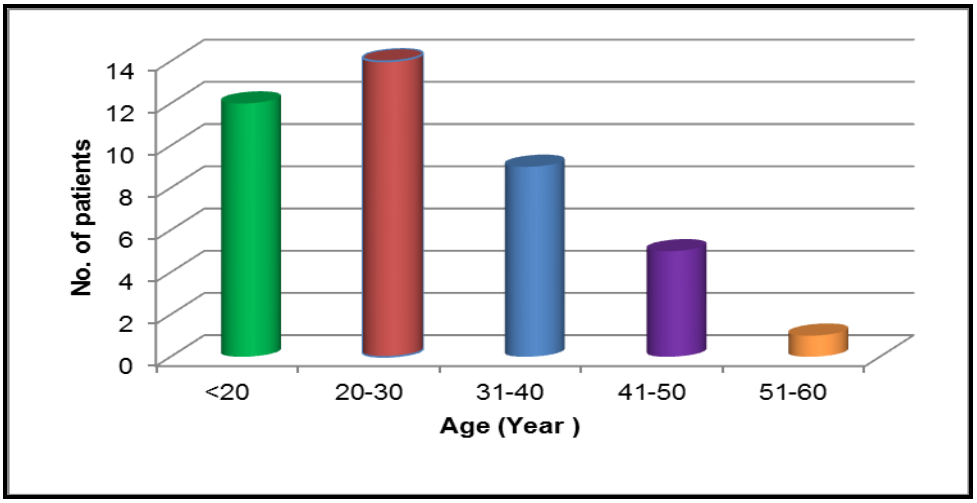
2.2 Statistical Analysis

The statistical analysis of this study is made by using SPSS program (Version 17.0) and the statistical processes used here were Means, Standard deviations, One way ANOVA and Chi square .

Results

3.1 Age

The highest percentage of benign breast tumors patients under investigation was recorded in (20-30 years) with 14 cases followed by 12 cases were seen in age of under 20 years , 9 cases in (31-40 y), 5 cases in (41-50 y), while only one case was noted in (51-60 y). as shown in figure 3.1



Figure(3-1): Distribution of age of benign breast tumors patient

3.2 Age at menarche

Table (3-1) clarifies that there was an increasing in the number and percentage of women who begin menarche at age less than 12 in benign group 13(16.3%) as compared to women in control group who begin menarche at same age 6(15%) . benign group showed a significant difference P≤0.05 when was compared with control group**.**

Table(3-1) distribution of control and benign groups according to the age at menarch

Age at menarche (year)	Control group		Benign group		χ^2	*P* value
	No .	%	No.	%		
≤ 12	6	15	13	16.3	22.46[a]	0.000
≥ 12	34	85	27	33.8		
Total	40	100	40	100		

a= significant differences when comparing control with benign group at P<0.05**.**

3.3 Abortion

Table (2-3) explained that the largest percentage of women who have an abortion was occur in benign group 9(11.3%) comparing with control group which contain women didn't suffering from an abortion through their life . benign group showed a significant difference P≤0.05 when was compared with control group**.**

Table (3-2) Distribution of control and benign breast tumor groups according to the presence of abortion .

Abortion	Control group		Benign group		χ^2	*P* value
	No .	%	No .	%		
Yes	0	0	9	11.3	10.01[a]	0.002
No	40	100	31	38.8		
Total	40	100.0	40	100.0		

a= significant differences when comparing control with benign group at P<0.05**.**

3.4 Residence

The majority of women in studied groups were lived in urban area as illustrated in table (3-3) which explains that benign group was appeared high percentage 34(85%) in comparison with control group 33(82.5%).Whereas the rest of women were lived in rural area ,7(17.5%) belongs to control group while the percentage decrease in benign group 6(15%) .

Table (3-3) Distribution of control and benign breast tumor groups according to the position of their living area

Residence	Control group		Benign group		χ^2	*P* value
	No .	%	No .	%		

Urban	33	82.5	34	85	0.091	0.763
Rural	7	17.5	6	15		
Total	40	100	40	100.0		

3.5 Cholesterol

The results of table (3-4) showed that the levels of cholesterol significantly P<0.05 increased in benign group (154.60**±43.81**) as compared with control group (127.37±**28.59**).

Table (3-4) Serum cholesterol levels (mg/dL) in control and Benign group .

Studied groups	No.	Mean±SD	*P* value
Control group	40	127.37±28.59	0.004
Benign group	40	154.60±43.81	
Total	80	140.98±39.23	

3.6 High density lipoprotein (HDL)

The results of table (3-5) were indicated that there was significant difference P≤0.030 in the levels of high density lipoprotein (HDL) in women with benign breast tumors (62.60**±22.96)** when the comparison takes place with healthy women in control group (49.72±4.85).

Table (3-5) Serum HDL levels (mg/dL) in control and Benign group .

Studied groups	No.	Mean±SD	P value
Control group	40	49.72±4.85	0.030
Benign group	40	62.60±**22.96**	

Total	80	56.16±**17.71**	

3.7 Low density lipoprotein (LDL)

Results listed in table (3-6) indicating a highly significant difference P≤0.001 in the level of low density lipoprotein (LDL) between the studied groups . Control group which obtained in this table shows (151.87±**1.58)** in comparing with benign group(57.59±**42.76)** which recorded significantly decreasing in the levels of LDL.

Table (3-6) Serum LDL levels (mg/dL) in control and Benign group .

Studied groups	No.	Mean±SD	P value
Control group	40	151.87±**1.58**	0.001
Benign group	40	57.59±**42.76**	
Total	80	104.73±**56.16**	

3.8 Triglycerides

The statistical analysis in table (3-7) showed a significant difference P≤0.000 in the levels of Triglycerides (TG) when comparison made between studied groups. The same table revealed that there was obvious increasing (172.05±**87.61**) in the levels of TG in women which belong to benign group followed by decreasing in its level (125.92±**31.23**) in the women in control group.

Table (3-7) Serum Triglycerides TG levels (mg/dL) in control and Benign group .

Studied groups	No.	Mean±SD	P value
Control group	40	125.92±**31.23**	0.000
Benign group	40	172.05±**87.61**	

Total	80	148.98±**69.35**	

3.9 Body mass index (BMI)

Table (3-8) shows that there was a highly significant difference P≤0.000 in the body mass index (BMI) among studied groups. Results of this table show that women in benign group was characterized by decreasing in the value of BMI (26.66±**5.35**) as compared with value of it in control group (29.14±5.06).

Table (3-8) Body mass index (BMI) (kg/m^2) in control and malignant groups .

Studied groups	No.	Mean±SD	P value
Control group	40	29.14±5.06	0.017
patients group	40	26.66±**5.35**	
Total	80	27.90±**5.32**	

Discussion

The result of the present study indicated that the incidence of benign breast tumors increased with 14 cases in interval age (20-30 years) followed by 12 cases in age under 20 years , this is similar to the finding of [10] who reported that benign breast tumors begin to rise in the second decade of life. The possible explanation of this result , there is general agreement in the clinical and epidemiological literature concerning the age distribution of benign breast tumors [11].Proliferative breast changes in women usually correlate with an individual's age. In adolescents and

young women, most clinical manifestations involve minimally symptomatic fibrotic changes that usually involve the upper, outer quadrants of the breasts[12].

This study revealed that early age at menarche ≤ 12 years was significantly associated with an increased risk of benign breast tumors with 13(16.3%) women in benign group in compared with 6(15%) women in control group, this result is quite similar to what was found in a hospital based case-control study of 288 women with histologically proven BBD and 285 age matched controls in Milan which was done by [13].

Regarding to abortion, this study showed significant association between previous history of abortion and development of benign breast tumors whether the cause of abortion spontaneous or not. History of spontaneous abortion has been mentioned as one of the risk factors for development of benign breast tumors by[14,15]. The causal association between abortion and benign breast tumors supported by the following biological factors :1- estrogen is a strong growth promoter of normal and most cancerous breast tissues 2- maternal estradiol rises 20-fold during the first trimester of normal pregnancy [16] .

The present study assessed the association between obesity and benign breast tumors and recorded significant decreasing in body mass index for women with these tumors in compared with healthy women. This result was confirmed with [17] who found that women with benign breast tumors were significantly more likely to be less obese and have reduced skin fold thickness than controls.

By examining the results of this study one can point to the statistical significance ($P < 0.004, 0.000$) of increasing the levels of serum cholesterol and triglycerides respectively. This result was agreed with (2) who found that triglycerides and cholesterol were significantly increased in diseased compared to control subjects although the LDL levels were similar. (2) also explained that elevation of HDL has been reported patients with cyclical mastalgia but not in those with non-cyclical pain.

We feel that higher levels of serum lipid leads to higher peripheral conversion of androstenedione into estrogen.

References

1- Santen RJ, Mansel R.Benign Breast Disorders. (2005) *N Engl J Med* ;353:275-85.

2- Khanna,S.; Singh, S.; Khanna,H.D.; et al. Evaluation of Estradiol Levels, Lipid Profile, Estrogen Receptor Status and it Correlation with Histological Variants in Benign Breast Diseases. (2012). World J. Pathol.1:10-13

3- Shaaban AM, Sloane JP, West CS. Histopathologic types of benign breast lesions and risk of breast cancer. (2002)Am. J. Surg. Pathol., 26: 421–430.

4- Guray M, Sahin AA. Benign Breast Diseases: Classification, Diagnosis, and Management.(2006). Oncologist 11:435-49.

5- Catherine Goehring and Alfredo Morabia Epidemiology of Benign Breast Disease, with Special Attention to Histologic Types. (1997) . Epidemiol Rev Vol. 19, No. 2

6- Mottahedeh M, Rashid MH, Gateley CA). Final diagnoses following C3 (atypical, probably benign) breast cytology.(2003) Breast, 12:276-279.

7- Hughes LE, Mansel RE, Webster DJT. The approach to diagnosis and assessment of benign breast lumps. (2005). Benign Disorders and Diseases of the Breast Concepts and Clinical Management, 2nd edn. London: WB Saunders;35.

8- Wybenga D.R. Pileggi, B.J.; Dirstina, T.H.; Di- Giogio.J.. Direct mannual determination of serum total cholesterol with a single stable reagent. (1970)Clin Chem. 16,980-984.

9- Sardesia,V.M.(Introduction to clinical nutrition,(1998).Marcel Dekker, In. New York.

10- Ageep,A.K.(. Benign breast tumors in Red Sea State), (2011) Sudan. Journal of Cancer Research and Experimental Oncology Vol. 3(7), pp. 84-87.

11- Ernster VL. The epidemiology of benign breast disease. (1981) Epidemiol Rev; 3: 184-202; Hislop TG, Elwood JM. (1981) Risk factors for BBD: A 30 years cohort study. Cand Med Assoc J; 124(3): 283-291.

12- Neinstein LS. Breast disease in adolescents and young women. (1999) .Ped Clin North Am; 46(3): 607-629.

13- Parazzini F, La Vecchia C, Franceschi S, Decarli A, Gallus G, Regall M, *et al.* Risk factors for pathologically confirmed benign breast disease. (1984) Am J Epidemiol; 120(1): 115-122.

14- Vorherr H. Fibrocystic breast disease: Pathophysiology, pathomorphology, clinical picture and management. (1986) Am J Obstet Gynecol; 154(1): 161-179.

15- Brinckerhoff LH and Slingluff Jr CL. Breast. In: General Surgery, Board Review Series. (2000) Carbtree TD, Foley EF, Sawyer RG. Philadelphia, Baltimore, New York: Lippincott Williams and Wilkins: 431-453.

16- Yu H, Diamandis EP, Levesque M, Giai M, Roagna R, Ponzone R, et al. Prostate specific antigen in breast cancer, benign breast disease and normal breast tissue.) 1996). Breast Cancer Res Treat;40:171-8.

17- Ingram D, Nottage E, Ng S, Sparrow L, Roberts A, Willcox D. Obesity and breast disease. The role of the female sex hormones. (1989)Cancer; 64(5): 1049-1053