



Research Article

EFFECT OF BMI AND AGE ON THE EXPRESSION OF ESTROGEN AND PROGESTERONE RECEPTORS IN WOMEN WITH BREAST CANCER

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Abstract

The remains highly prevalent and mortality type of cancer among women to present has been called Breast cancer (BC). This study was aimed to investigation of hER and hPR expression on status of BMI and ages of women with BC. The BC group included in present work were 90 women at the ranging of age between of 18 - 66 years, the calculated mean \pm SD was in the range between of (43.7 \pm 4.3) years. Thirty apparently healthy women were taken as a control group of the age ranging (25-63) years, the mean \pm standard deviation (SD) was (44.6 \pm 2.9) years. ELISA kit has been used to estimate of human estrogen and progesterone receptor (hER and hPR). The results of present work suggested that the both of age and BMI were found statistically significant associated with positive expression of hER and hPR (p-value< 0.05) in women with BC. Also, the results shown statistically significant in serum level of hER (ng/ml) and hPR (ng/ml) of study groups. The serum levels of hER and hPR were significantly raise (134.9 \pm 11 ng/ml, P<0.05) in the patient group compare to healthy group (78.8 \pm 8.2 ng/ml) and (166.9 \pm 20 ng/ml, P<0.05) in women with BC compare to control group (98.7 \pm 11.7 ng/ml), respectively. The results show of high expression of hER and hPR may be correlated with the age and BMI of women and this has the main role in the raise in the occurrence rate of BC.

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1. Introduction

The stays distinctly conventional and mortality sort of most cancers amongst ladies to provide has been referred to as Breast cancer (BC) (Parkin, 2001). The insufficient advantages of remedy and early detection, furthermore the shortage of suitable centers for analysis and detection are the primary reasons for the occurrence of BC (Boyle and Levine, 2008).

The maximum not an usual place most cancers amongst ladies on this is BC (Salim *et al.*, 2018). The important reason of incapacity and mortality amongst ladies, predominately younger ladies, in low- and middle-profits regions has been referred to as BC (Al-Hussainy *et al.*, 2020). The insufficient attention of the blessings of remedy and early detection, furthermore the shortage of suitable centers for prognosis and detection, additionally poor accessibility to number one remedy is likely due to the instances of fatality quotes (Lauby *et al.*, 2015). The important reason of incapacity and mortality amongst ladies, predominantly younger ladies, in low- and middle-

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profits regions is referred to as BC (Francis *et al.*, 2018; Zhou *et al.*, 2019; Siddharth *et al.*, 2017). Despite the fact that the prognosis and remedy techniques of breast most cancers are lately improved, the prevalence quotes preserve to increase (Skibinski *et al.*, 2015). Many researchers confirmed that BC is the maximum not unusual place most cancers in ladies and the brand new instances of ladies with BC in 2018 have been greater than 250,000 withinside the USA and BC could be recognized in 12 % of all ladies withinside the USA over their lifetimes (Najjar and Easson, 2010). Approximately, 2.1 million ladies have been predicted with breast most cancers in 2018, Globally (NIH, 2018). Al-Gazally *et al.* (2018) say that BC is a first-rate public fitness trouble and the main reason of most cancers-associated deaths amongst Iraqi ladies (Al-Gazally *et al.*, 2018). In advanced countries, the a whole lot better prevalence quotes have been opposite numbers in much less advanced and poor-resourced areas throughout the globe, the corresponding mortality quotes are low, whilst Africa recorded 1,68,690 instances of recognized breast most cancers in 2018 with 74,072 deaths occurring, however in North America was suggested to have recorded 2,62,347 recognized instances of breast most cancers and 46,963 deaths (Raghad *et al.*, 2017; Runnak *et al.*, 2017; Hamzah *et al.*, 2020; Ali *et al.*, 2020). The objective of this study to investigation of hER and hPR expression on status of BMI and ages of women with BC.

2. Materials and Methods

Patient group

The BC group recruited in present work were 90 women and the range of age are (18 - 66) years with the mean \pm SD at 43.7 ± 4.3 years. The patients were screened and treated in the oncology centers of three provinces, Babylon, Al-Najaf, and Baghdad provinces. The diagnosis of BC cases confirmed by CT-scanning, ultrasound, MRI and biopsy with histopathological examination. The exclusion criteria were:

- a) Unknown histological examination status of ER was excluded.

- b) Unknown histological examination status of PR was excluded.
- c) Unknown histological examination status of Her-2 was excluded.
- d) All women who underwent radio and hormonal therapy were excluded.
- e) Triple negative breast cancer (ER, PR, and Her-2) were excluded.

The adjuvant and neoadjuvant drugs included the followings:

- "Anthracyclines, such as doxorubicin"
- "Taxanes, such as paclitaxel (Taxol) and docetaxel (Taxotere)"
- "Trastuzumab, a humanized anti-Her-2 monoclonal antibody"
- "5-fluorouracil (5-FU) or capecitabine"
- "Cyclophosphamide (Cytoxan)"
- "Carboplatin (Paraplatin)"
- "Capecitabine (Xeloda)"
- "Platinum agents (cisplatin, carboplatin)"
- "Everolimus (afinitor)"

Control group

Thirty ladies were taken as a control group of the age ranging 25 - 63 years, the mean \pm Standard deviation (SD) was 44.6 ± 2.9 years. The ages of this group were matched to ages patient group ($p > 0.05$).

Measurement of human serum Estrogen (hER) and progesterone Receptor (hPR)

The micro-titer plate supplied with ELISA package has been pre-lined with antibody for human estrogen and progesterone receptor (hER and hPR). Standard, samples, and HRP conjugated antibody had been brought to wells. After incubation and washing to eliminate the uncombined enzyme, the Chromogen answer become brought. The colour of the liquid become modified into blue. At the impact of acid, the colour in the end will become yellow. The colour extrade become measured spectrophotometrically at a wavelength of 450 nm. The attention of ERB with inside the samples become decided *via* way of means of evaluating the O.D. of the samples to the usual curves, as shown in Figure 1.

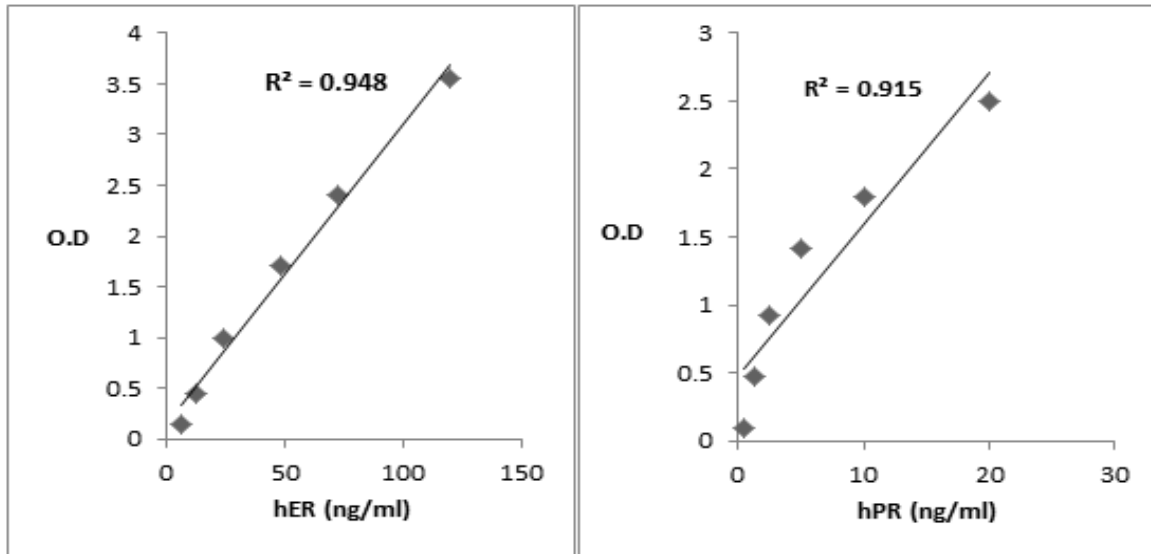


Figure - 1: hER and hPR ELISA Standard curves

3. Results

Table 1 displaying of the Clinic-pathological traits of ladies with BC worried on this study (n=90):

Table (1):Clinic-pathological traits of the look at group

Clinic-pathological	Number(%)
Total patients	N=90
Family history	
with	30(33)
without	60(67)
Histological type	
IDC	35(38)
ILC	55(62)
Histological grade	
Grade 1+2	60(66)
Grade 3+4	30(34)
Menopausal status	
Pre	48(53)
Post	42(47)
Site of cancer	
Right	45(50)
Left	45(50)

Results of this study pointed that the age and BMI of women with BC were statistically significant associated with positive expression of hER and hPR (p-value< 0.05), as shown in Table - 2.

The Figure - 2, depicted serum level of hER (ng/ml) and hPR (ng/ml) in women with BC and control groups. The serum levels of hER and hPR were significantly raise (134.9±11 ng/ml, P<0.05) in patient group and (78.8±8.2 ng/ml) in

healthy group and (166.9±20 ng/ml, P<0.05) in patient group compare to healthy group

(98.7±11.7 ng/ml), respectively.

Table - 2: Effects of BMI and age in metastasis BC on Positive receptors expression

Variables	BC total N = 90	Positive hER (n = 49)			Positive hPR (n = 41)		
		N	OR	CI (95 %)	N	OR	CI (95 %)
Age							
< 45	55	31	5.25	0.33-4.68*	27	2.69	0.33-5.84*
≥ 45	35	18			14		
BMI							
< 25	30	19	3.40	0.88-5.81*	11	3.22	0.45-
≥ 25	60	30			5.67*		30

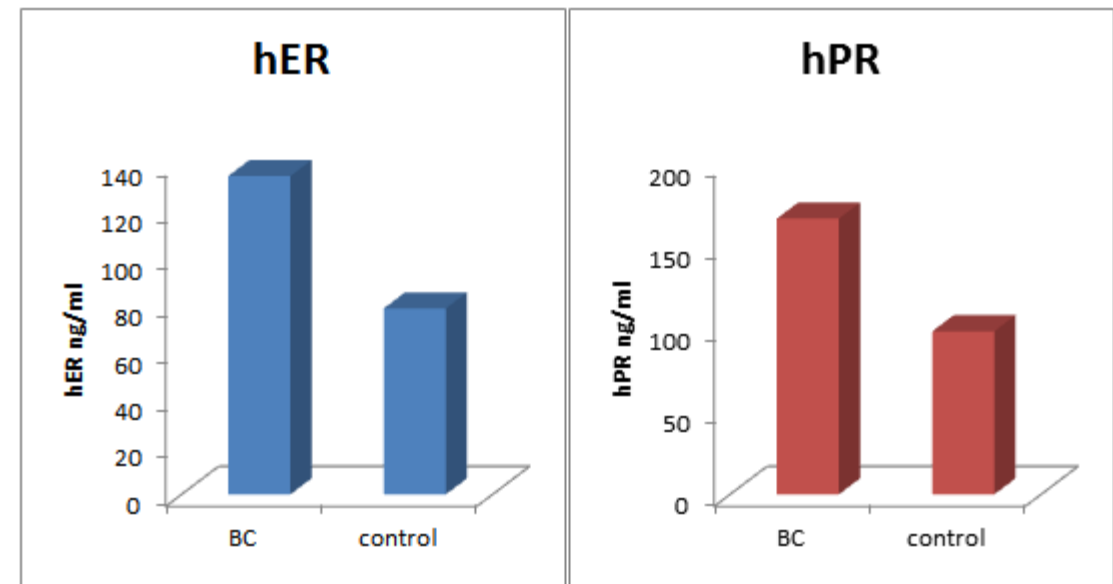


Figure - 2: hER and hPR levels (ng/ml) in BC and control groups

4. Discussion

The results of this study show that the highest frequency of BC was in women with age 18 - 66 years. This trend of frequency rate in relation to age was inconsistent to that reported for Arab countries and globally. Thakur *et al.* (2017) were suggested that age is one the most important known risk factor for BC. They found that females with age >50 years were 49 % but female with age < 50 were 51 %. Furthermore, the fact that the prevalence of BC correlate with age and this finding disagreement with the results of present study that showing the incidence rate increase with age. Other study from Iraq suggested that the

age is the main risk factor for BC and the incidence rate increase with age and this results in same line with my finding (Renehan *et al.*, 2008). The present results disagreed with two studies in Iraq performed on BC and revealed that the peak of age frequency in the Iraqi BC patients was 44.5 years, and that 76.8 % were under 50 years (Kang *et al.*, 2008; Goldberg *et al.*, 2019). Amongst 90 women with BC who contributed in this study, there were classified according to the BMI (≥25 and < 25) into two sub-groups depending on BMI. For obese and excess body weight (over weight and pre-obese) is generally recognized as a significant risk factor for many common cancers

included BC (Carol *et al.*, 2019). The results show increase incidence of BC in women have not expressed Her-2 receptor and this will give a negative correlation between women have (BMI \geq 25) and negative Her-2 receptor expression. This cause–effect relationship between obesity indices and BC has been espoused in various studies including that of (Kang *et al.*, 2018). Additionally, most women in Iraqi community are mainly housewives who live sedentary lifestyle and thus prone to obesity which is a major factor in the development of BC. The results shows not effects of age and BMI on expression of Her-2 receptors in metastasis status. In metastasis BC, the overexpression of ER and PR may be correlated with cancer stages and metastasis organ status. The results shows not effects of age and BMI on expression of Her-2 receptors in metastasis status. In metastasis BC, the overexpression of hER and hPR may be correlated with cancer stages and metastasis organ status. The results show that expression of ER, and PR receptors can change during the course of the disease in BC (Zhong *et al.*, 2020). In conclusion, the high expression of hER and hPR may be correlated with the age and BMI of women and increasing in the incidence rate of BC.

5. Conclusion

The results show of high expression of hER and hPR may be correlated with the age and BMI of women and this has the main role in the increase in the incidence rate of BC.

Conflict of interest

No.

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