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IMPACT OF OBESITY ON BREAST DISEASES

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ABSTRACT

Background: The association between obesity and breast diseases has increasingly become a subject of substantial concern and investigation within the medical community, accounting for a significant proportion of cancer diagnoses and deaths among women. The aim of study is to assess the association between obesity and breast diseases. **Method:** retrospective cross-sectional research of 267 female patients' breast clinic consultants at Al Karkh hospital in Baghdad from June 2022 to June 2023. All female archival data includes age/years, weight, height, family history, menstrual cycle history, and breast diseases diagnosis, also measured the BMI for all females. **Results:** In a study of 267 females, most were aged 41-50 years. The majority had no family history of breast diseases and experienced irregular menstrual cycles. Obesity was prevalent at 44.2%, followed by overweight at 33.3%. Significant associations were found between obesity and menstrual irregularities, family history of cancer, and type of breast disease diagnosis. Specifically, obesity rates were higher among those with irregular cycles, a family history of cancer, and certain types of breast disease like fibrocystic disease. No correlation was found between age and BMI. **Conclusion:** Our study highlights the significant associations between obesity and factors like menstrual cycle regularity, family history, and types of breast disease. These findings emphasize the need for multi-dimensional risk assessment and lifestyle interventions, particularly in weight management, to improve breast health outcomes.

KEYWORDS: Impact, obesity, breast, Diseases.

INTRODUCTION

Obesity is an excessive accumulation of body fat,[1] the impact of obesity on breast diseases has increasingly become a subject of substantial concern and investigation within the medical community.[2] Concurrently, obesity reached an epidemic proportion worldwide.[3,4,5] Given the considerable morbidity and mortality rates associated with breast diseases, understanding the factors that contribute to its incidence is vital for both prevention and treatment strategies.[6] The biological mechanisms behind the relationship between obesity and breast diseases are yet to be fully elucidated but are thought to involve hormonal imbalances, systemic inflammation, and insulin resistance.[7,8] Furthermore, obesity has also been implicated in poorer outcomes among breast diseases patients, including a higher likelihood of cancer recurrence and reduced survival rates.[9,10] Relationship becomes increasingly urgent in the context of the rising global prevalence of obesity and breast diseases. Publishing in Iraq stated that Breast cancer is the most prevalent form of the disease among women. One of the determinants of breast cancer is obesity.[11] The aim of this study was to assess the effect of obesity on breast diseases.

METHOD

A total of 267 females' patients attending the breast clinic in Al Karkh hospital in Baghdad from June 2022 to June 2023. All case files were reviewed. The requested data were age/years, weight, height, family history, menstrual cycle history and diagnosis of each type of breast diseases. BMI was conducted and categorized.[1] Inclusion criteria; all females came to breast clinic in Al Karkh hospital. No exclusion criteria. Chi-square was used to examine the impact of independent variable (obesity) on the dependent variable (disease of breast). A significant P-value is less than or equal to 0.05.

RESULTS

A total 267 females with breast disease consultant the breast clinic in Al Karkh hospital in Baghdad. Peak age group is 41-50 years old female (35.2%) and followed by 51-60 years (24%). 58.4% of females have no any

pervious family history of breast ca., 53.5% of females have irregular M. history as shown in table 1.

Table 1: Distribution of patients according to study variables.

Variables		No.	percentage
Age group (years)	21-30	18	6.7
	31-40	55	20.6
	41-50	94	35.2
	51-60	64	24.0
	>60	36	13.5
Family history	1st relative	30	11.2
	2nd relative	55	20.6
	history of other malignancies	26	9.7
	No family history	156	58.5
M. history	Regular	80	30.0
	Irregular	142	53.2
	Menopause	45	16.8

As shown in fig 1; 85.8% of females have benign lesions while 14.2% of females have malignancy as diagnosis of breast disease.

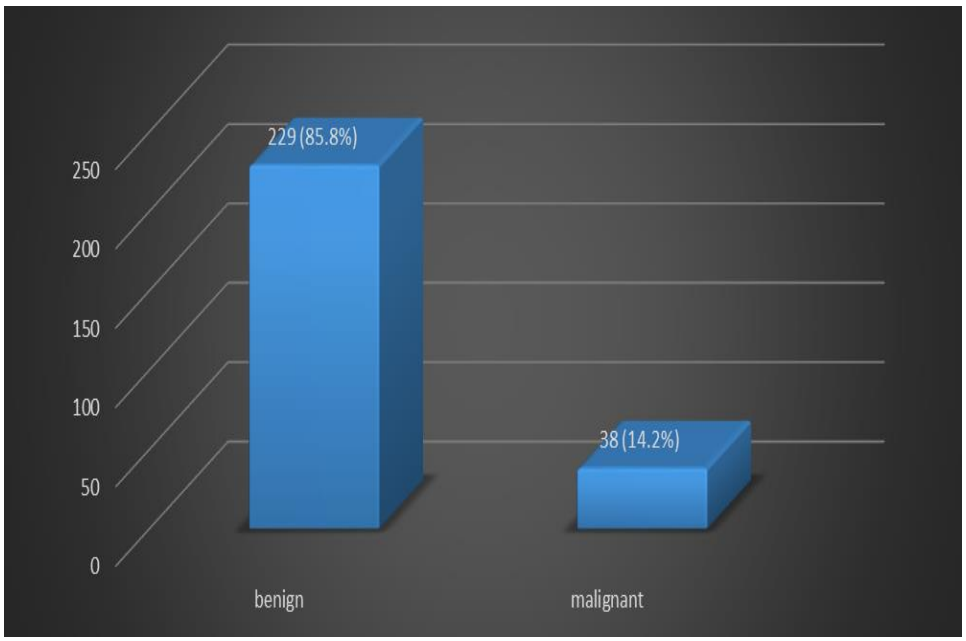

Fig. 1: Distribution of patients according to diagnosis.

As shown in fig 2; 44.2% of females are obsess while 33.3% of females are overweight and 22.2% of females are normal BMI.

In table 2; the study showed that malignancy was significant increase with age (P=0.004) (90.4%) of females at age group 21-50 years have benign lesion while only 9.6% of females have malignant breast lesion. Also (17.8%) of obese females have malignant breast with significant association between malignant breast lesion and females BMI, there is significant association between malignant breast lesion and menstrual cycle, (17.6%) of females have irregular cycles diagnosed as malignant breast lesion while 22.2% of females have menopause diagnosed as malignant breast lesion. No significant association between malignant breast lesion females and previous family history.

Table 2: association between BMI of females and Age group, MC History, Family History and Diagnosis.

Variables		Diagnosis		P-value
		Benign (%)	Malignant (%)	
Age group	**21-50**	151 (90.4)	16 (9.6)	χ^2 = 7.9, d.f.=1, p = 0.004
	≥ 51	78 (78)	22 (22)	
BMI	**normal**	58 (96.7)	2 (3.3)	X^2=7.5, D.f.=2 0.023
	overweight	74 (83.1)	15 (16.9)	
	Obese	97 (82.2)	21 (17.8)	
Family History	**1st relative**	26 (86.7)	4 (13.3)	X^2=3.8, D.f.=3 0.28
	2nd relative	44 (80)	11 (20)	
	Other malignancies	25 (96.2)	1 (3.8)	
	no	134 (85.9)	22 (14.1)	
MC	**Regular**	77 (96.3)	3 (3.7)	X^2=10.8, D.f.=2 0.004
	Irregular	117 (82.4)	25 (17.6)	
	Menopause	35 (77.8)	10 (22.2)	

DISCUSSION

It's well-documented that the risk of breast cancer increases with age.[12] The data indicates that the most affected age group is more than 50 years old. This could be due to several factors including hormonal changes associated with perimenopause, lifestyle factors that have had more time to exert their influence, and potentially a study effect where this specific group of women has experienced particular exposures or health trends.[12] It's expected to see a high incidence in this age group as well, given that postmenopausal women are at an increased risk for breast cancer, and the risk doesn't significantly diminish immediately after the 50s.[13] This statistic is in line with broader epidemiological data that suggest most breast cancers are sporadic, meaning they do not result from inherited mutations like those in the BRCA1 or BRCA2 genes. This highlights the importance of screening and surveillance in the general population, not just those with a family history.[14] The high prevalence of benign breast lesions reflects common conditions such as fibrocystic changes, fibroadenomas, and other non-cancerous disorders of the breast. This underscores the importance of distinguishing between benign and malignant conditions for appropriate management and to alleviate patient anxiety.[15]

The associations observed between malignant breast lesions and age, body mass index (BMI), and menstrual cycle regularity present an interesting pattern of risk factors that align with several findings in the extant literature on breast cancer risk factors.

Age Association

The finding that the highest prevalence of malignant breast lesions was in the more than 50 years' age group is consistent with global cancer statistics, which indicate that breast cancer risk increases with age. The American Cancer Society highlights that the median age of breast cancer diagnosis in women in the United States is around 62 years, which suggests that post-menopausal women are at a higher risk.[16] This increase in risk could be attributed to the cumulative effects of hormonal exposure over a woman's lifetime, along with the increased probability of genetic mutations as one ages.[17] Also Iraqi study agreed with current results that highest prevalence of malignant breast lesions was in the 51-60 years' age.[11]

Obesity and BMI Association

The significant association between obesity and malignant breast lesions is also corroborated by substantial epidemiological evidence. A meta-analysis by Hidayat K et al. (2018) found that for every 5 kg/m² increase in BMI, there was a 12% increase in breast cancer risk for postmenopausal women.[18] The biological mechanisms proposed for this association include increased levels of estrogen produced by adipose tissue, higher levels of insulin and insulin-like growth factors, and chronic inflammation, all of which can contribute to carcinogenesis.[19]

Menstrual Cycle Regularity

The association between menstrual cycle irregularity and malignant breast lesions is intriguing and can potentially be explained by the disruption of hormonal regulation. Irregular menstrual cycles may reflect an underlying endocrine disorder, such as polycystic ovary syndrome (PCOS), which has been linked to an increased risk of endometrial cancer, and more recently, breast cancer.[20] This irregularity could potentially result in abnormal exposure to hormones like estrogen and progesterone, which are known to influence breast cancer risk.[21]

Lack of Association with Family History

Contrastingly, the lack of a significant association between malignant breast lesions and previous family history is somewhat unexpected, given the well-documented hereditary component of breast cancer. Mutations in high-penetrance genes like BRCA1 and BRCA2 can confer a risk of breast cancer that is much higher than the general population risk.[22] However, these genes account for a small percentage of overall cases. Most breast cancer cases are considered sporadic or resulting from a combination of genetic, environmental, and lifestyle factors.[23] The observed lack of association in the mentioned study could be due to a variety of factors, including the possible

underreporting of family history, small sample sizes, or genetic heterogeneity.

CONCLUSION

These findings underscore the multifactorial nature of malignant breast lesions and the importance of considering a wide range of risk factors in their diagnosis and management. They also highlight the importance of targeted screening and prevention strategies, particularly in postmenopausal, obese women, and those with menstrual irregularities. However, further research is required to fully understand the complexities of these associations and to explore the potential biological mechanisms underpinning the lack of association with family history.

REFERENCES

1. Centers for Disease Control and Prevention. Defining Adult Overweight and Obesity. Retrieved from CDC website. 2021.
2. ray, F., Ferlay, J., Soerjomataram, I., Siegel, R. L., Torre, L. A., & Jemal, A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA: A Cancer Journal for Clinicians, 2018; 68(6): 394–424.
3. World Health Organization. Obesity and overweight. Retrieved from WHO website, 2020.
4. Calle, E. E., Rodriguez, C., Walker-Thurmond, K., & Thun, M. J. Overweight, obesity, and mortality from cancer in a prospectively studied cohort of U.S. adults. The New England Journal of Medicine, 2003; 348(17): 1625–1638.
5. Renehan, A. G., Tyson, M., Egger, M., Heller, R. F., & Zwahlen, M. Body-mass index and incidence of cancer: a systematic review and meta-analysis of prospective observational studies. The Lancet, 2008; 371(9612): 569–578.
6. DeSantis, C. E., Ma, J., Gaudet, M. M., Newman, L. A., Miller, K. D., Goding Sauer, A.,& Siegel, R. L. Breast diseases statistics, 2019. CA: A Cancer Journal for Clinicians, 2019; 69(6): 438–451.
7. Goodwin, P. J., Stambolic, V., & Lemieux, J. Obesity and insulin resistance in breast diseases—chemoprevention strategies with a focus on metformin. Breast, 2015; 24: S31–S35.
8. Iyengar, N. M., Hudis, C. A., & Dannenberg, A. J. Obesity and cancer: local and systemic mechanisms. Annual Review of Medicine, 2015: 66: 297–309.
9. Protani, M., Coory, M., & Martin, J. H. Effect of obesity on survival of women with breast diseases: systematic review and meta-analysis. Breast diseases Research and Treatment, 2010; 123(3): 627–635.
10. Chan, D. S., Vieira, A. R., Aune, D., Bandera, E. V., Greenwood, D. C., McTiernan, A. & Norat, T. Body mass index and survival in women with breast diseases—systematic literature review and meta-analysis of 82 follow-up studies. Annals of Oncology, 2014; 25(10): 1901–1914.
11. Aqeel Rashid F, Mahdi S, Abd-Alkader Mahdy S, Thamer Salim A. Effect of Obesity on Plasma Alkaline Phosphatase Activity in Breast Cancer. Rep Biochem Mol Biol., 2021 Jul; 10(2): 307-313. doi: 10.52547/rbmb.10.2.307. PMID: 34604420; PMCID: PMC8480287.
12. Yazdani A, Dorri S, Atashi A, Shirafkan H, Zabolinezhad H, editors. Bone Metastasis Prognostic Factors in Breast Cancer. . *Breast Cancer (Auckl)*, 2019; 13: 1178223419830978.
13. Pardhe BD, Pathak S, Bhetwal A, Ghimire S, Shakya S, Khanal PR, et al. Effect of age and estrogen on biochemical markers of bone turnover in postmenopausal women: a population-based study from Nepal. *Int J Womens Health*, 2017; 9: 781–788.
14. Reiner, A. S. *et al.* Breast cancer family history and contralateral breast cancer risk in young women: An update from the women's environmental cancer and radiation epidemiology study. *Journal of Clinical Oncology*, 2018; 36: 1513–1520.
15. Posso M, Alcántara R, Vázquez I, Comerma L, Baré M, Louro J, Quintana MJ, Román M, Marcos-Gragera R, Vernet-Tomas M, Saladie F, Vidal C, Bargalló X, Peñalva L, Sala M, Castells X; BELE study group. Mammographic features of benign breast lesions and risk of subsequent breast cancer in women attending breast cancer screening. Eur Radiol, 2022 Jan; 32(1): 621-629. doi: 10.1007/s00330-021-08118-y. Epub 2021 Jun 22. PMID: 34156554.
16. May Abdul Salam, Jawad K. Al-Diwan. Breast Symptoms Among Women Attendant's to Early Detection Breast Clinic. IJPHRD [Internet], 2022 Jun. 24 [cited 2023 Nov. 3]; 13(3): 171-4. Available from: https://medicopublication.com/index.php/ijphrd/article/view/18191
17. Alwan NAS. Breast Cancer Among Iraqi Women: Preliminary Findings From a Regional Comparative Breast Cancer Research Project. J Glob Oncol, 2016 Mar 16; 2(5): 255-258. doi: 10.1200/JGO.2015.003087. PMID: 28717711; PMCID: PMC5493264.
18. Hidayat K, Du X, Shi BM. Body fatness at a young age and risks of eight types of cancer: systematic review and meta-analysis of observational studies. Obes Rev., 2018 Oct; 19(10): 1385-1394. doi: 10.1111/obr.12705. Epub 2018 Jul 25. PMID: 30047231.
19. Liu LN, Lin YC, Miaskowski C, Chen SC, Chen ML. Association between changes in body fat and disease progression after breast cancer surgery is moderated by menopausal status. BMC Cancer, 2017 Dec 18; 17(1): 863. doi: 10.1186/s12885-017-3869-1. PMID: 29254480; PMCID: PMC5735658.
20. Harris HR, Terry KL. Polycystic ovary syndrome and risk of endometrial, ovarian, and breast cancer: a systematic review and meta-analysis. Fertil Steril, 2016; 106(4): 931-942.

21. Brown SB, Hankinson SE. Endogenous estrogens and the risk of breast, endometrial, and ovarian cancers. Steroids, 2015 Jul; 99(Pt A): 8-10. doi: 10.1016/j.steroids.2014.12.013. Epub 2014 Dec 30. PMID: 25555473.
22. Safra T, Waissengrin B, Gerber D, Bernstein-Molho R, Klorin G, Salman L, Josephy D, Chen-Shtoyerman R, Bruchim I, Frey MK, Pothuri B, Muggia F. Breast cancer incidence in BRCA mutation carriers with ovarian cancer: A longitudal observational study. Gynecol Oncol, 2021 Sep; 162(3): 715-719. doi: 10.1016/j.ygyno.2021.06.009. Epub 2021 Jun 23. PMID: 34172288.
23. Laitman Y, Michaelson-Cohen R, Chen-Shtoyerman R, Goldberg Y, Reish O, Bernstein-Molho R, Levy-Lahad E, Baruch NEB, Kedar I, Evans DG, Haim S, Paluch-Shimon S, Friedman E. Age at diagnosis of cancer in 185delAG BRCA1 mutation carriers of diverse ethnicities: tentative evidence for modifier factors. Fam Cancer, 2021 Jul; 20(3): 189-194. doi: 10.1007/s10689-020-00216-y. Epub, 2020 Nov 9. PMID: 33165727.