Prevalence of women breast cancer

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ABSTRACT

Breast cancer, the most frequent disease in women worldwide, represents a significant public health concern on a global scale. Breast cancer was the most frequent type of cancer among Iraqi women in 2018, accounting for the highest percentage of malignant tumors in women. Breast cancer is a set of physiological and molecular heterogeneous diseases that begin in the breast. Advanced breast cancer with distant organ metastases is considered incurable with current therapies. Aside from new treatment improvements, the next global challenge in breast cancer care is equal worldwide access to therapeutic advances. The incidence of breast cancer continues to rise in every part of the world. Despite advances in its identification and treatment, which have resulted in lower mortality rates, it appears vital to seek out new therapeutic approaches, predictive and prognostic indicators. The article provides a literature review of breast carcinoma, a condition that affects women worldwide. As a result, women should be aware of the disease's course, the importance of regular screenings for early detection of breast cancer, and the best treatment options.

1. Introduction

For many years, breast cancer has had the greatest prevalence of all cancers in women worldwide. In 2018, an estimated 2.1 million women were diagnosed with breast cancer, with one new case being found every 18 seconds; also, 626,679 breast cancer patients died [1].

Breast cancer is the most prevalent malignancy in 154 of 185 countries, and the main cause of cancer-related mortality in more than 100, according to the most recent WHO estimates. With about 2.1 million new cases reported in 2018, it is the most common cancer among women worldwide, accounting for 25% of all recorded female cancers [1-3]. Incidence rate variations are typically attributed to higher prevalence of risk factors, notably in transitional regions of South America, Africa, and Asia [4]. Breast cancer is a complicated and multifaceted disease that induces abnormal cell proliferation and tumor formation. It is the most common female cancer, affecting one out of every eight women. Approximately 10% of all breast cancers are hereditary, most usually caused by autosomal dominant genetic abnormalities [5, 6].

The primary risk factor for having breast cancer is simply being a woman. Men can get breast cancer, although women are about 100 times more likely than men to get it [7]. On the other hand, some studies have revealed a relationship between oxidative stress and breast cancer risk, as well as the beneficial impact of antioxidants (both enzymatic and non-enzymatic) [8].

Swelling of the breast, skin scraping, pain in the nipple, secretions, redness, or skin scraping of the nipple or breast are the earliest physical indications of breast cancer [9]. The expression of androgen receptors (AR) has recently been studied in breast cancer, with AR being associated to cell

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proliferation and metastasis in ER-negative breast cancer [10]. The majority of patients tested positive for ER and PR receptors, according to the findings of this study. There is growing evidence that ER and PR receptors play a role in breast cancer formation, making it an attractive protein to become a primary target for cancer treatment [11]. Furthermore, a number of cancer indicators have been associated to an increased risk of breast cancer [12].

Because breast cancer is a worldwide problem, significant emphasis must be made on minimizing global disparities in access to diagnosis, multimodal treatment, and novel medications. Upcoming breast cancer therapeutic concepts intend to individualize therapy and de-escalate and escalate treatment based on cancer biology and early response to therapy [13]. The article provides a literature review of breast carcinoma, a condition that affects women worldwide, examine the prevalence of female breast cancer and discuss the current time pattern.

2. Breast cancer statistics

In partnership with the International Agency for Research on Cancer (IARC)/WHO, the Iraqi National Breast Cancer Research Program was formed in 2010, and a complete information system database for patients diagnosed with the disease was built [14]. Several studies have revealed that Iraqi females are more likely than Western females to present with breast cancer at a younger age, in advanced stages, and with more aggressive behavior [15]. In patients under the age of 50, a recent comparative investigation discovered that significant differences in clinical and tumor features between Iraqi and British patients persisted even after age was corrected [16].

Breast cancer is more prevalent in the most developed countries, although the breast cancer mortality rate is higher in the less developed countries [17]. Breast cancer is the most prevalent malignant tumor in Iraqi women and the second largest cause of death in women [18], after cardiovascular disease.

Breast cancer incidence rates in Iraq remained relatively stable from 2000 to 2009;

however, the most current figures from the Iraqi Cancer Registry indicate a considerable increase in incidence rates after 2009, particularly among women over 50 [19].

Breast cancer accounted for 19.4% of all cancers diagnosed, 34.7% of malignant tumors in women, and 22.5% of cancer-related deaths among Iraqi women in 2013 [20]. According to research conducted in Iraq, a considerable proportion of middle-aged women had the highest incidence of breast cancer, with more than 40% of cases being diagnosed at an advanced stage [21].

According to the most current yearly report of the Iraqi Cancer Registry [22], the total number of new cancer cases reached (31,502) out of an estimated population of 38 million. The total number of deaths attributable to cancer was (10,293). Breast cancer has the greatest incidence rate among the top ten most common cancers in Iraq, according to Table 1.

Table 1. Distribution of cancers with the highest incidence and death in Iraq (2018) [18-21].

Higher Incidence rate	No.	%	Higher mortality rate	No.	%
Breast	6,206	19.70	Bronchus and lung	1,628	**15.82**
Bronchus and lung	2,529	8.19	Breast	1,198	**I1.64**
Colorectal	1,936	6.15	Leukemia	865	**8.40**
Leukemia	1,899	6.03	Brain and CNS	830	**8.06**
Urinary bladder	1.542	4.89	Colorectal	637	**6.19**
Brain and CNS	1.541	4.89	Stomach	554	**5.38**
Thyroid gland	1.413	4.49	Liver	535	**5.20**
Non-Hodgkin lymphoma	1,268	4.03	Pancreas	479	**4.65**
Skin and other	1142	3.63	Urinary bladder	417	**4.03**
Prostate	1023	3.25	Non-Hodgkin lymphoma	343	**3.33**
Total top 10	20,549	65.Z3	Total top 10	7,486	**72 73**
Total cancers of other sites	10,953	34.77	total cancers of other sites	2,807	**27.27**
Total	31,502	100	Total	10,293	100

Incidence of breast cancer has increased in recent years in the Kingdom of Saudi Arabia

(KSA), with the number of cases increasing from 1152 per 100.000 people in 2008 to 1473 per 100.000 inhabitants in 2010 and 1826 per 100.000 inhabitants in 2014 [23]. According to the KSA health council's 2014 cancer registry, breast cancer was the most prevalent malignancy in women, accounting for 28.7% of all malignancies. Another study attributed 13.08% of all fatalities to breast cancer, 98% of which occurred in females and 12% in males [23, 24]. Similar investigations on the general populace have also been conducted in Saudi Arabia [25]]. However, few research has been conducted on healthcare personnel in the Kingdom of Saudi Arabia. As a result, we conducted this study to examine the knowledge, attitudes, and practices of female healthcare workers regarding breast cancer screening[24].

It has reported [26], breast cancer is the most common form of cancer among women in Qatar. In 2006, the incidence of breast cancer in Qatar was 30 per 100,000 women, while the incidence of other cancers was less than 9 per 100,000 women [27]. Lebanon has the highest age-adjusted breast cancer incidence rate in the Middle East, according to the International Agency for Research on Cancer (IARC) [29] and GLOBOCAN, 2008 [28]. Bahrain (49.8/100,000), Kuwait (47.7/100,000), and Jordan (47/100,000) follow. The Gulf Cooperation Council (GCC) countries with the highest breast cancer incidence rates are Bahrain (49.8/100,000), Kuwait (47.7/100,000), and Qatar (38.1/100,000). From 1998 to 2001, the breast cancer incidence rate in Qatar was 38.1/100,000, which was higher than the rates in Saudi Arabia (22.4/100,000) and Yemen (20.2/100,000) [29]. According to the WHO (2006), the high breast cancer mortality rates in Middle Eastern nations are primarily attributable to late illness detection. According to the World Health Organization, the breast cancer mortality rate in Qatar in 2008 was 12.9%/100,000 [30].

This mortality rate is higher than in other Arab peninsular nations, such as Saudi Arabia (10.4/100,000) and the United Arab Emirates (10.9/100,000), although also have the lowest breast cancer incidence rates in the Middle East [31].

In the Arabic women population, a family history of breast cancer, younger age, a higher level of education, employment, knowledge of breast cancer symptoms, and urban residence were all associated with BCS [32]. In addition, past study indicates that a physician's recommendation is the most influential factor in the utilization of mammography [33].

In 2015, there were 1.5 million newly diagnosed cases of breast cancer (representing 25% of all cancer diagnoses among women) and around 570,000 deaths [34].

With 2.26 million [95% CI, 2.24-2.79 million] new cases estimated by 2020 [35], breast cancer is the most prevalent malignancy in women worldwide. Predictions indicate that breast cancer will account for 29% of all new cancers diagnosed in women in the United States [36]. According to 2018 GLOBOCAN statistics, breast cancer age-standardized incidence rates (ASIR) are strongly and positively associated with the Human Development Index (HDI) [37]. According to statistics from 2020, the ASIR in countries with a very high HDI was the highest (75.6 per 100,000), while it was more than 200% lower in countries with a medium and low HDI (27.8 per 100,000 and 36.1 per 100,000, respectively) [35].

Breast cancer is not just the most common kind, but also the main cause of cancer-related mortality among women worldwide. Breast cancer was the cause of death for 684,996 individuals globally [35]. Despite having the highest incidence rates among industrialized regions, Asia and Africa accounted for 63% of all deaths in 2020 [35], despite having the highest incidence rates among developing regions. Women in high-income countries have a greater chance of surviving breast cancer than women in low-income and many middle-income nations [38].

In 2020, 0.30 was the global mortality-to-incidence ratio (MIR) for breast cancer as a measure of 5-year survival rates [39]. Taking the clinical extent of breast cancer into account, the 5-year survival rate in established health-care environments (Hong Kong, Singapore, and Turkey) was 89.6% for localized cancer and 75.4% for regional

cancer. Localized and regional breast cancer survival rates in less developed nations (Costa Rica, India, the Philippines, Saudi Arabia, and Thailand) were 76.3% and 47.4%, respectively [40].

One in every eight women in the United States is expected to get invasive breast cancer over her lifetime. In 2018, around 266,000 new cases of invasive breast cancer and nearly 266,000 new cases of non-invasive breast cancer are expected to be diagnosed in women in the United States [1].

As of January 2018, about 3,1 million women in the United States had a history of breast cancer, including those who were actively being treated and those who had completed treatment. In addition to the numbers for women, it is anticipated that approximately 2500 new cases of invasive breast cancer will be diagnosed in men in the United States in 2018. In the United States, breast cancer kills more women than any other cancer except lung cancer [41].

Among addition to having the second highest rate of cancer-related mortality, breast cancer is one of the most often diagnosed cancers in women in the United States. Approximately thirty percent of newly diagnosed malignancies in women will be breast cancer. African-American women under the age of 45 are more likely to develop breast cancer than white women in the United States. Cancer of the breast is more prevalent among African-American women. In contrast, Asian, Hispanic, and Native American women in the United States have a lower risk of developing and dying from breast cancer [1].

3. Demographics, incidence and mortality

The number of breast cancer cases around the world has been rising at a rate of 3.1% per year, from 641,000 in 1980 to more than 1.6 million in 2010 [42]; this trend is expected to continue. In fact, as the world's population grows and people live longer, the number of women with cancer is rising in all countries, no matter how much money they have. Women make up 49.5% of the world's population, and a higher percentage of people over 60 are women. Also, research into the

epidemiology of advanced breast cancer is a top priority. In most countries, it's hard to know how many people have advanced illness because cancer registries only record new diagnoses and deaths. In 2017, 160,000 women in the United States alone were diagnosed with breast cancer at an advanced stage, according to one study [43]. Different types of breast cancer also have different death rates. HER2-positive disease has the highest death rate, followed by TNBC, luminal A, and luminal B [44].

Also, people in developing countries are 10 years younger when they are diagnosed with breast cancer than people in developed countries. 10% of patients in richer countries are under 35 years old, but up to 25% of patients in developing Asian countries are under 35 [45]. The biology of the tumor is also different depending on the person's race, which may explain why the death rate is different [46].

African and African-American women, for example, had more cases of TNBC than women of any other race. They also had the highest rates of metastatic disease and the worst differentiation or undifferentiated grade of all subtypes, which are all linked to shorter survival [47]. Furthermore, metastatic breast cancer accounts for 9% of non-Hispanic black women's diagnosis, compared to 5-6% of diagnoses in other ethnic groups. In terms of 5-year cause-specific survival increases in patients with advanced disease from 1975 to 2013, non-Hispanic white women outperformed other ethnic groups, particularly non-Hispanic black women (19-37% vs. 16-26%). This pattern is multifaceted, with genetic predisposition, lifestyle, and other environmental factors all playing a role [48].

Due to delayed presentation, late stage at diagnosis, and restricted access to treatment, breast cancer mortality is typically higher in many low- and middle-income countries, such as those in Sub-Saharan Africa [49] and developing Asian countries [50], despite their lower incidence. Several studies have also indicated that breast cancer appears earlier in Asian women (usually 40-50 years of age) than in western women (generally 60-70

years of age) [51]. Furthermore, patients diagnosed with breast cancer in underdeveloped nations are 10 years younger than those in industrialized ones. Young patients (35 years old) account for 10% of patients in affluent nations and up to 25% in developing Asian countries [52].

The biology of the tumor also differs by ethnicity, which may explain the disparity in mortality [46]. African and African-American women, for example, had the greatest incidence of TNBC compared to any other ethnic group. They also had the highest rates of metastatic disease and the worst differentiation or undifferentiated grade of all subtypes, which are all linked to poor survival [53, 54]. The number of breast cancer cases in Poland is significantly lower than in the EU (in 2013, the standardized incidence rate for Poland was 51.8%, compared to 106.6% for the EU) [55].

In the past 30 years, the prevalence of adult premenopausal women (20–49 years) has nearly doubled. Regrettably, Polish women continue to be insensitive to prevention. They disregard their breasts and disregard the significance of frequent checkups. In comparison to other European nations, the prevalence of preventative treatment among Polish women is low; in the Netherlands, 80% of women report free mammography prevention programs, in England 71%, and in Poland only 44% [55]. In Poland, the 5-year breast cancer survival rate is 78.5 percent, which is much lower than, for example, the 90 percent survival rate in the United States [56].

Breast cancer kills about 15% of women. Lung cancer kills 13.8%, colorectal cancer kills 9.5%, and cervical cancer kills 7.5%. 2,3 [57]. In Iraq, breast cancer is the most common type of cancer in women. According to the Children's Cancer Research Institute (CCRI), it is the leading cause of cancer in women. In the most recent Iraqi Cancer Register, it was linked to about a third of all cancers. It is expected that 30% (252,710) of all new cancer cases in women in the United States will be breast cancer [58].

The disease is responsible for 16% of deaths around the world, including in Iraq,

where people get it and other types of cancer. This is most likely because of wars and pollution in large provinces, especially the south, where people are exposed to radioactive materials and weapons as well as chemicals that can cause cancer [59]. The number of deaths was highest among women over 70. Table 2 shows that of the ten most common types of cancer in women, breast cancer had the highest death rate and rate of new cases, while stomach and uterine nonspecific cancer had the lowest.

According to the World Health Organization, early detection and screening, especially when combined with the correct treatment, provides the most immediate hope for reducing breast cancer deaths [60]. This was the basis for the Iraqi national breast cancer early detection program, which started in 2001 to try to reduce the severity of the disease when it first showed up. Since then, all of the major hospitals in Iraq's provinces have added special equipment and clinics to help find breast cancer early. The major demographic characteristics and clinicopathological presentation of 721 female Iraqi patients diagnosed with breast cancer at the Main Referral Training Centre for Early Detection of Breast Tumors in Baghdad are reviewed [61].

The examining physician routinely entered age, marital status, and residence, history of lactation, contraceptive pills, and/or hormone therapy, and family history of breast cancer on the patient's file page questionnaire. Tissue biopsies were examined data on tumor size and nodal status. To rule out metastases, abdominal ultrasonography and chest X-rays were conducted, as well as a skeletal examination when warranted [61].

The advancement of molecular biology has made research at the level of the human genome conceivable. Just 1.2% of human genetic material encodes protein, but 93% of genes are transcribed. The enormous number of non-coding RNA molecules has piqued the interest of scientists. In breast cancer, microRNAs, single-stranded RNA molecules with a length of 21 to 23 nucleotides that regulate the expression of other genes, were the topic of serious study [62].

In 2005, the first published accounts of the potential implications of altered miRNA expression in breast cancer appeared. Many miRNA compounds associated in breast cancer start, development, and metastasis have been found over the past decade [63]. In contrast, Loh et al. reported the decisive carcinogenic potential of the miR-200 family in a 2019 review study [64]. Higher concentrations of specific miR-200s were connected not only with the ability of breast cancer to produce distant metastases, but also with treatment resistance [65].

The association between the expression of the abundant miRNA family and the cell cycle, especially the aberrant cell cycle of tumor cells, deserves undoubtedly greater investigation. There is no doubt, however, that the molecules in question have enormous diagnostic, prognostic, and therapeutic promise. Scientists are on the lookout for new regulating molecules due to encouraging research findings [66]. Figures 1 to 3 and table 3 display 2020 World Health Organization (WHO) statistics for Iraq.

Table 2. Distribution of cancer and mortality rates among Iraqi women (2018) [67]*.

| Higher Incidence rate	No.	%	Higher mortality	No.	%
Breast	6,094	34.06	Breast	1,166	23.02
Thyroid gland	1,097	6.13	Bronchus and lung	462	9.12
Colorectal	918	5.13	Leukemia	393	7.76
Leukemia	838	4.68	Brain and CNS	382	7.54
Bronchus and lung	749	4.19	Colorectal	292	5.77
Ovary	721	4.03	Liver	264	5.21
Brain and CHS	719	4.02	Stomach	255	5.03
Hon-Hodgkin lymphoma	588	3.29	Ovary	208	4.11
Skin and other	558	3.12	Pancreas	198	2.9I
Stomach	455	2.54	Uterus unspecified	184	3.63
Total top 10	12,737	71.20	Total top 10	3,804	75.10
Total cancers of other sites	5,153	28.80	Total cancers of Other sites	1,261	24.90
Total	17,890	100	Total	5,065	100

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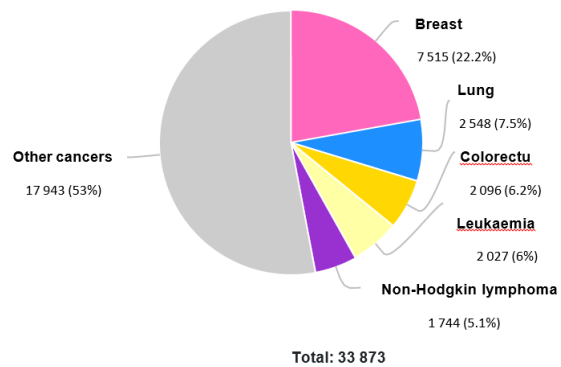
Fig. 1. The breast cancer number (new cases) in Iraq, in 2020, both sexes, all ages [18-21].
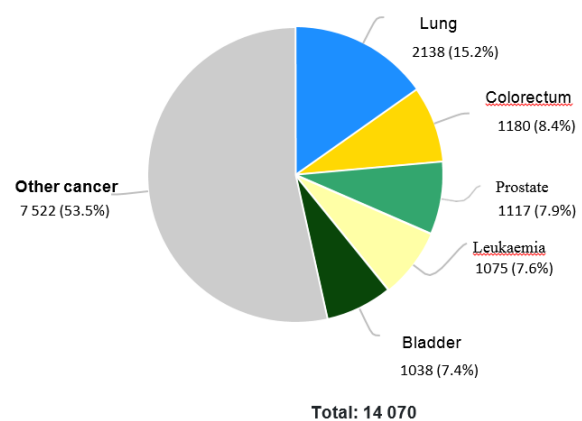
Fig. 2. The breast cancer number (new cases) in Iraq, in 2020, males, all ages [18-21].
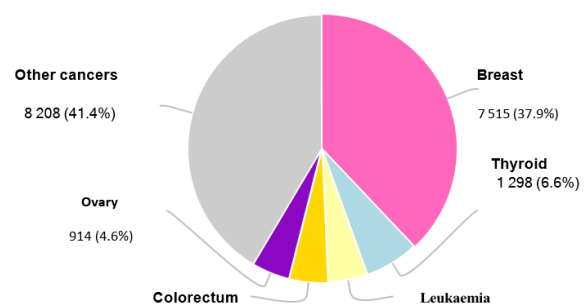
Fig. 3. The breast cancer number (new cases) in Iraq, in 2020, females, all ages [18-21]

Table 3. Shown the incidence, mortality and prevalence by cancer number in both women and man in Iraq (2020) (WHO) [18-21].

Cancer	New cases				Death				5-year prevalence (all ages)	
	Number	Rank	(%)	Cum.risk	Number	Rank	(%)	Cum.risk	Number	Prop. (per 100 000)
Breast	7 515	1	22.2	5.72	3 019	1	15.3	2.42	20 354	102.46
Lung	2 548	2	7.5	1.41	2 326	2	11.8	1.28	2 694	6.70
Leukaemia	2 027	3	6.0	0.69	1 545	3	7.8	0.60	5 623	13.98
Non-Hodgkin lymphoma	1 744	4	5.1	0.80	1 010	5	5.1	0.50	4 528	11.26
Thyroid	1 660	5	4.9	0.51	237	19	1.2	0.10	4 797	11.93
Brain, central nervous system	1 600	6	4.7	0.59	1 366	4	6.9	0.55	4 094	10.18
Bladder	1 359	7	4.0	0.71	690	8	3.5	0.36	3 343	8.31
Colon	1 305	8	3.9	0.62	797	7	4.0	0.38	2 860	7.11
Stomach	1 149	9	3.4	0.56	966	6	4.9	0.48	1 579	3.93
Prostate	1 117	10	3.3	1.44	416	14	2.1	0.31	2 373	11.66
Ovary	914	11	2.7	0.78	678	10	3.4	0.66	2 213	11.14
Hodgkin lymphoma	808	12	2.4	0.24	304	17	1.5	0.12	2 428	6.04
Kidney	798	13	2.4	0.37	418	13	2.1	0.22	2 021	5.02
Rectum	754	14	2.2	0.36	463	12	2.3	0.22	1 783	4.43
Liver	713	15	2.1	0.40	686	9	3.5	0.39	803	2.00
Pancreas	674	16	2.0	0.36	661	11	3.3	0.36	671	1.67
Corpus uteri	611	17	1.8	0.60	191	21	0.97	0.19	1 730	8.71
Larynx	479	18	1.4	0.28	330	16	1.7	0.20	1 217	3.03
Multiple myeloma	440	19	1.3	0.23	367	15	1.9	0.21	979	2.43
Cervix uteri	286	20	0.84	0.25	193	20	0.98	0.19	704	3.54
Lip, oral cavity	264	21	0.78	0.14	146	22	0.74	0.08	650	1.62
Oesophagus	254	22	0.75	0.14	240	18	1.2	0.13	276	0.69
Testis	219	23	0.65	0.10	47	26	0.24	0.04	734	3.61
Gallbladder	170	24	0.50	0.10	140	23	0.71	0.09	223	0.55
Nasopharynx	162	25	0.48	0.07	111	24	0.56	0.05	422	1.05
Salivary glands	125	26	0.37	0.07	61	25	0.31	0.04	358	0.89
Melanoma of skin	109	27	0.32	0.05	30	27	0.15	0.02	292	0.73
Kaposi sarcoma	53	28	0.16	0.03	17	30	0.09	0.01	134	0.33
Anus	37	29	0.11	0.02	23	29	0.12	0.01	86	0.21
Vulva	28	30	0.08	0.04	14	31	0.07	0.02	74	0.37
Mesothelioma	27	31	0.08	0.02	24	28	0.12	0.02	31	0.08
Hypopharynx	25	32	0.07	0.01	10	33	0.05	0.01	44	0.11
Oropharynx	19	33	0.06	0.01	14	32	0.07	0.01	43	0.11
Vagina	19	34	0.06	0.02	10	34	0.05	0.01	45	0.23
Penis	1	35	0.00	0.00	0	35	0	0	4	0.02
All cancer sites	33 873	-	-	14.11	19 786	-	-	9.11	79 057	196.5

4. Conclusion

Breast cancer incidence has increased in Iraq in recent years; yet, a significant number of breast cancer patients in Iraq still have locally advanced disease at the time of diagnosis. This demonstrates the importance of promoting public awareness education programs in order to develop our national early detection program.

Conflict of Interests

All authors declare no conflict of interest.

Ethics approval and consent to participate

No human or animals were used in the present research.

Consent for publications

All authors read and approved the final manuscript for publication.

Informed Consent

The authors declare not used any patients in this research.

Availability of data and material

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Authors' contributions

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