Screening of Breast Cancer Based on Age

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Abstract:-We aimed to describe the effects of age which plays the major role in the breast cancer. Currently, breast cancer affects approximately 12% women worldwide. The occurrence of breast cancer increases with age; this in turn leads to increased number of deaths. We discuss the screening methods by which the breast cancer detection is done by which the mortality rate decreases with the early detection. Accusing the prevalence rates of breast cancer in circumstances of age, we examine the observed correlatives. Finally, we discuss about the research work done on the breast cancer considering ageing factors.

Keywords: - Breast Cancer, Age, Screening, Mammography.

I.   INTRODUCTION

The common cause of the cancer death in women is mostly seen in breast cancer patients worldwide in which 23% of total cancer and 14% of all the cancer related deaths [1]. The risk of developing the breast cancer in the women is about 1/8. The people who aged above 65 are accounts for about >40% and this has almost 60% of the mortality rate for breast cancer [4,6]. The risk of developing the breast cancer increases by age in the women's lifetime. The information from the SEER programme i.e.; surveillance epidemiology and end results of the National Cancer Institute {NCI} shows that for women older   in the age group, the incidence rate of 322 per 10,000 population is more than 5 times greater than the rate of 60 per 10,000 for women younger than 65 years [2]. Approximately 7% of the women with breast cancer were diagnosed before the age of 40 years, and these accounts for more than 40% of all the cancers in women in this age group [7, 11]. In these review, we will examine the detection of the breast cancer by considering Age by screening methods.

II.   POPULATION BASED SCREENING AND AGE

The initial identification of the breast cancer by screening programmers has resulted in the increased detection of breast cancer of all age groups. By these, early screening and detection of breast cancer leads to decreased mortality rate, with the maximum benefit seen in women aged 50-70 years [3, 5, 8]. Currently the breast cancer screening programmed are running in more than 26 countries across the world {Table-1; shows 20 countries, modified from [9, 14]; table shows the screening year introduced, age groups screened, and number of population screened annuallyThe current evidence shows that the full field digital mammography {FFDM} is the gold standard for the screening of breast cancer [16]. The comparison of screened versus non screened groups of patients >70years old shows that the reduced mortality rates in the screened patients with the breast cancer diagnosed at the early stage [10,16]. It also states that the decreased mortality is due to the improved adjuvant treatment [11,18,20]. In the United States, the Preventive Task Force currently recommends the biennial screening for all the women aged 50-75 years old. By observing the benefits of the screening programmes, many countries have increased the age range of the patients screened. The United Kingdom has extended the screening programme to women of 45-73 years of age. However, the screening method has the controversies that the best results are observed using the double reading and two projections [12,19]. The sensitivity of mammography is shown approx.79%, and is decreased in the women with dense breast tissue and in younger women [13, 17, 15][table -2]. In the last few years, the new imaging techniques has emerged, like tomosynthesis, contrast enhanced spectrum mammography and automated whole breast ultrasound [23, 29, 21]. The magnetic resonance imaging [MRI] when combined to the mammograms increases the breast cancer detection rates in the younger women[24, 28, 22, 30], as the sensitivity of the mammography is decreased in the younger women[13]. The overall sensitivity of the MRI in the breast cancer detection ranges between 71% to 77.3%, although this can be increased up to 94% when the MRI is combined with mammography [25, 24, 28]. According to table-2, the digital mammography is the best method for detecting the breast cancer except in younger patients where a high variability is seen. In the older patients {>50 years old}, the digital mammography is the most commonly used diagnostic tool. The MRI is time consuming, expensive {compared to mammography} has a lower specificity [24, 28, 27, 32]. The screening may detect the cancers in high risk age groups. The patients with a family history who are at the higher risk then common population. The evolution of the genetic testing for breast cancer susceptibility genes such as BRCA1 and BRCA2 has developed in many countries and it is the major tool for the diagnosis of the patient with the strong family history of breast cancer [26, 31].Very little research is done on the ageing factors such as menarche, menopause, and reproductive status compared to the genetic risk factors. Many clinical trials have evolved the new diagnostic tests and treatment options of breast cancer. Randomized clinical trial has done in the breast cancer patients from younger age groups.

COUNTRY	YEAR OF SCREENING STARTED	AGE INTERVAL	POPULATION SCREENED PER YEAR
Switzerland	1999	50–69	60,700
Norway	1996	50–69	199,818
France	1989	50–74	2,343,980
Australia	1991	40–75+	1,700,000 *
Italy	2002	50–69	1,340,311
Luxembourg	1992	50–69	14,586
Poland	2006	50–69	985,364
Rep of Ireland	2000	50–64	28,794
Sweden	1986	40–74	1,414,000
Israel	1997	50–74	220,000
Canada	1988	50–69	196,187
Denmark	1991	50–69	275,000
France	1989	50–74	2,343,980
Spain	1990	45–69	527,000
Netherlands	1989	50–74	961,786
Japan	1977	40–75+	2,492,868
Finland	1987	60–64	N/A
Portugal	1990	45–69	100,364
Saudi Arabia	2007	40–64	6200
Iceland	1987	40–69	20,517

*50-69 years old

Table1: Screening Programmes Conducting Countries for Breast Cancer

DIGITAL MAMMOGRAPHY		MAGNETIC RESONANCE IMAGING	
Age Group	Sensitivities (21, 22)	Clinical Guidelines	Sensitivities (30, 26, 27)
<40	54%-77%	Family history of breast cancer	
40-49	77%-86%		
50-59	78%-93%	Binneal Screening (between 50-75 of age)	71%-77.3%
60-69	78%-94%		
>70	81%-91%		

Table 2: Breast Cancer Screening Programs and Detection Rates.

III.   SUMMARY

With our ever expanding knowledge of breast cancer and age related effects, there are many improvements in the detection and survival rates have improved a lot by the introduction of screening methods. With the application of the screening methods, the mortality rates of breast cancer are very much decreased. Although in the younger patients, the applicability of the screening methods like mammography to the younger women is less, so with the addition of the resonating techniques like magnetic resonance imaging (MRI) to the mammography, detection of the breast cancer is made easy to the younger women.

As the more research work is focused on the genetic factors, the screening of the breast cancer is decreased with the patients related to the ageing factors. So the research must also be focused towards the age related factors causing the breast cancer. With these, the better outcome is seen in terms of screening and diagnosis considering the age.

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