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RISK FACTORS OF BREAST CANCER IN ABHA CITY: A CASE CONTROL STUDY

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ABSTRACT

Breast cancer remains the most commonly diagnosed cancer in women, and it is the second leading cause of cancer related death. Worldwide; more than a million women are diagnosed with breast cancer every year. Breast cancer incidence is increasing in most regions. The Objectives include: to Study the risk factors of breast cancer among Saudi women and initiate women's awareness regarding breast cancer. The case control study was the selected study design, setting: Departments of surgery and chemotherapy at the Asser general hospital in Abha city, Saudi Arabia. The index group (n= 32) was cases of confirmed female breast cancer patients presented in the surgical and chemotherapy departments during the period of the study .The control group was women attending mammogram unit and free from the disease. Tools of data collection: A structured questionnaire was prepared in Arabic .Data were collected by personal interview method. Health awareness lecture was given to women in public places and faculties. Though cases are more obese than controls (21.88% compared to 32.69%) yet the difference is not statistically significant (p>0.05); however, Odds ratio = 1.735

It was found that age of menarche of cases is significantly lower (11.875 ± 1.373 y) than that of controls (13.288 ± 1.412 y) (t=2.138, p < 0.05). The median duration of breast feeding was shorter among cases than controls (16 compared to 48 months) .There is no significant difference between cases and controls regarding age of first pregnancy, number of children, or age of menopause (P< 0.05respectively). History of use of oral contraceptive pills is found to be significantly more among cases than controls where X2= 5.556 and odds ratio= 3. Estimated cancer risks detected by this research are lack of physical exercise (14.17), don't eat vegetables or fruits (5.455), use of oral contraceptive pills (3.00), self examination of the breast (4.822) and breast biopsy whenever indicated (2.583),and younger age of menarche. The study recommended with further studies on a large sample size for generalization, awareness program for women about breast awareness should be initiated, health promotion should be provided through healthy guidelines and nutritional education programme focusing on healthy diet and the importance of eating fresh vegetables and fruits.

Keywords: Breast Cancer, Risk Factor , Mammogram , Awareness, and Health Education.

INTRODUCTION

Breast cancer is the most common cancer in females accounting for 20% of all female cancers. Every year approximately one million new cases of female breast cancer are diagnosed worldwide, most of which occurs in developed countries. Breast cancer is the leading cause of female cancer death(*Butt,z.,etal,2009*).

Breast cancer is by far the most frequent cancer of women (23% of all cancers), with an estimated 1.15 million new cases in 2002, ranking second overall when both sexes are considered together. More than half of the cases are in industrialized countries—about 361,000 in Europe (27.3% of cancers in

women) and 230,000 in North America (31.3%). Incidence rates are high in most of the developed areas (except for Japan, where it is third after colorectal and stomach cancers), with the highest age-standardized incidence in North America (99.4 per 100,000) (*American Cancer Society Website 2008).*

In part, the high incidence in the more affluent world areas is likely because of the presence of screening programs that detect early invasive cancers, some of which would otherwise have been diagnosed later or not at all. (*American Cancer Society,2005*) The incidence is more modest in Eastern Europe, South America, Southern Africa, and Western Asia, but it is still the most common cancer of women in these geographic regions. The rates are low (<30 per 100,000) in most of Africa (with the exception of South Africa) and in most of Asia. The lowest incidence is in Central Africa (ASR, 16.5 per 100,000*)* (*Tarone RE.,2006).*

Breast cancer is at the top among all the malignancies seen in Saudi females, comprising of 21.8% [(4)]. In addition, breast cancer in young Saudi's women is a crucial problem, with the proportion of young age-onset breast cancer much higher than in western countries. According to the 2002 annual report of Saudi national cancer registry, breast cancers that developed before the age 40 accounted for 26.4% of all female breast cancers compared with only 6.5% in USA(*Registry NC.2007*).

Denic S, etal,(2003) ,determined the number of breast cancer cases among women in Saudi Arabia between 1998 and 2002 to be 2,987. This amounted to 20.3% of all cancer cases in the country, with an ASR of 12.9 per 100,000 populations. They categorized Saudi Arabia as a country with a 'high incidence' of breast cancer

Qatar was also categorized as a country with a 'high incidence' of breast cancer, with an ASR of 35.5 per 100,000 populations(*Denic S, etal,2003*) . In United Arab Emirates in the city of Al-Ain, the age-standardized incidence of breast cancer for 1998 for the population was 15.5 per 1000. (*Denic S, Bener A. 2001*).This is far lower than the incidence rates in neighboring countries such as Kuwait and Saudi Arabia(*Bener A.,etal,2002).*

Generally, it is believed that the incidence of breast cancer in Arab women is low compared with other populations(*Ravichandran K, Al-Zahrani AS.,2009*). Very few studies on risk factors for breast cancer in Arab women have been reported.

Nurses today assume multiple roles, such as patient advocacy, providing care, and research investigator, screening, prevention, and detection. In the United States and Sweden; outlined the uses of practice guidelines, nurses expanded their patient care responsibilities and promoted cancer control by expanding their skills. In the 21st century, nurses interested in cancer control expect to broaden the scope of their care and their research roles further by continuing to improve training, advocating screening (and increased education about screening), and helping to establish new sources of funding for research (*Fakhro AE,etal,1999*).

Aim of the work is to:

a) Study the risk factors of breast cancer among Saudi women.
b) Initiate women's awareness regarding breast cancer.

RESEARCH METHDOLOGY

The case control study was the selected study design as it is time and effort saving. It is also suitable for diseases with long latency period and can examine multiple etiological factors for a single disease.

Setting: Departments of surgery and chemotherapy at the Asser general hospital in Abha city, Saudi Arabia.

The index group (n= 32) was cases of confirmed female breast cancer patients presented in the surgical and chemotherapy departments during the period of the study (3 months).

The control group was women attending mammogram unit and free from the disease. One or two controls for each case were selected matched by age of cases were selected during the period of the study. They totaled 52 women.

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Criteria for selection of cases:

1- Age: not below 40 years old.
2- Diagnosis: Newly diagnosed not more than one year

Criteria for selection of controls: controls were selected from women in the public after awareness and matched by age and attended the mammogram unit and have a free mammogram report.

Tools of data collection: A structured questionnaire was prepared in Arabic .Data were collected by personal interview method. Verbal consent was taken from women under the study. The questionnaire form include: sociodemographic data, marital status, number of live births, age at first live birth and history of breastfeeding, age of menarche, breast self examination, family history of cancer, age of menopause, history of smoking, passive smoking, history of eating vegetables and fruits and physical exercise.

Method:

Health awareness lecture was given to women in public places and faculties. The lecture was about definition of cancer, risk factors, and methods of prevention; the importance of early detection through monthly self breast examination and periodic examination through mammogram and the importance of early treatment. Women were directed to mammogram unit at Asser general hospital for free examination where the first ninety women fulfilling the selection criteria and who were free from the disease were selected as a control group.

Field work:

The study conducted by the researchers within 12 months period "starting from January 2010 (1431 H). Before data collection women informed about the aim and steps that will be carried out. After that data collected by interview method**.**

Administrative design:

An agreement to conduct the study was obtained from the administrator of the hospital and supervisors of the selected departments.

Statistical design:

Quantitative continuous data were described by mean and standard deviation and the unpaired t test of significance was used. Categorical data were described using the Chi square test and Fisher's exact test. Odds ratio was used to calculate the estimated relative risk. The level of significance used was 5%. *P* value <0.05 indicated significance. The statistical analysis was conducted with SPSS version 16.0 for Windows.

RESULTS

The sample size revealed thirty cases and fifty two controls that were matched by age. Age of cases ranged from 30 to 80 years ($\overline{X}$ =56.656 ± 9.667 y); that of controls was from 30 to81years ($\overline{X}$ = 54.481± 8.799). t= 1.273 and p > 0.05. The educational level of cases ranged from illiterate to secondary while that of the controls ranged from illiterate to university yet the difference is statistically non significant (P>0.05). Yet, education was found to be a risk factor (odds ratio=1.224). Regarding occupation, all cases were housewives where about two thirds (67.92%) of the control group were working (p=0.003). Regarding occupation, all cases were housewives where about two thirds (67.92%) of the control group were working (p = 0.003). There is no significant difference regarding the marital status (p=0.635). Those who were not married were either divorced or widow.

Risk Factors:

Though cases are more obese than controls (21.88% compared to 32.69%) yet the difference is not statistically significant (p>0.05); however, Odds ratio = 1.735

It was found that age of menarche of cases is significantly lower (11.875 ± 1.373 y) than that of controls (13.288 ± 1.412 y) (t=2.138, p < 0.05). The median duration of breast feeding was shorter

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among cases than controls (16 compared to 48 months) .There is no significant difference between cases and controls regarding age of first pregnancy, number of children, or age of menopause (P< 0.05respectively).

Though the difference is not significant (p=0.147), yet more of controls examined their breast. The estimated risk of self examination of the breast is 4.822.

Table I: Risk factors of cancer breast among Saudi women in Asser region

Risk Factors	Cases (n=32) No.	%	Controls (n= 52) No.	%	Test result
Education					
Non educated	17	53.13	25	48.08	X^2= 0.202
Educated	15	46.87	27	51.92	Odds ratio= 1.224
Occupation					
Housewife	32	100	40	67.92	p=0.003
Working	0.00	0.00	12	23.08	
Marital status					p=0.635
Married	2	6.25	3	5.77	Odds ratio= 1.089
Widow or divorced	30	93.75	49	94.23	
Obese	25	78.12	35	67.31	X^2 = 1.136
Normal	7	21.88	17	32.69	Odds ratio=1.735
Age menarche		11.875 ± 1.373		13.288 ± 1.412	t= 2.138*
Age of 1st delivery		18.500 ± 5.346		22.233± 7.380	t=1.509
No. of children		6.966 ± 2.312		6.250 ± 3.143	t=0.807
Age of menopause		50.826 ± 4.163 (n=23)		51.306 ± 3.671 (n=31)	t=0.388
Breast examination					
No	31	96.88	45	86.54	p=0.147
Yes	1	3.12	7	13.46	Odds ratio= 4.822
Positive family history of cancer breast					
Yes	3	9.38	5	9.62	p= 0.643
No	29	90.63	47	90.38	Odds ratio = 0.972
Previous breast biopsy					
No	31	96.88	48	92.31	p=0.645
Yes negative	1	3.12	4	7.69	Odds ratio= 2.583
History of use of contraceptive pills					
Used	22	68.75	22	42.31	X^2= 5.556*
Not used	10	31.25	30	52.69	Odds ratio =3
Passive smoking					
Yes	2	6.25	7	13.46	p=0.472
No	30	93.75	45	86.54	Odds ratio= 0.429
Eating fruits and vegetables					
No	10	31.25	4	7.69	X^2 =23.841*
Yes	22	68.75	48	92.31	Odds ratio = 5.455
Exercise					
No	24	75.00	42	80.77	X^2 = 0.546
Yes	8	25.00	10	19.23	Odds ratio= 14.17

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It was found that positive family history of breast cancer or having a previous breast biopsy is not a risk factor (p= 0.643 and odds ratio =0.972). But having a history of breast biopsy though not significant (p= 0.645) yet, the estimated relative risk is 2.583.

History of use of oral contraceptive pills is found to be significantly more among cases than controls where X^2= 5.556 and odds ratio= 3.

Passive smoking is not a risk factor among Saudi women (p= 0.472, odds ratio= 0.429).

Non eating fresh vegetable and fruits is a risk factor of cancer breast affecting Saudi women (X^2 =23.841). The estimated relative risk is 5.455.Doing physical exercise though not significant yet, the estimated relative risk is 14.17

DISCUSSION

Breast cancer (referring to mammary carcinoma, not mammary sarcoma) is an extremely common malignancy, affecting one in eight women during their lifetime. In fact, in women, 32% of all cancers arise in the breast, but they only account for 18% of cancer deaths. Designating an individual as high risk for breast cancer depends primarily on a positive family history. In addition, ethnic origin is also related to cancer risk.
The present study revealed that mean age of cases was 56.656+9.667. This is nearly inconsistent with the result of *Andreas, et.al (2010),*who found that the mean age of cases and controls were 56.1 ± 9.1.

Education:
The present findings showed that there is no significant difference between cases and control group regarding the level of education, the estimated relative risk is 1.224.This is supported by the findings of *Ebrahimi,M., Vahdaninia, M., and Montazeri, A., (2002).* But other studies revealed that patients with breast cancer were significantly more educated. *Ozmen, V., etal,(2009),Negri E, etal,(1996), Tavani A, Braga C, Vecchia L (1997), Braaten T, (2004).Tavani et al [1999],* revealed that patients with breast cancer were significantly more educated (>13 years) than controls *Velentgas P, Daling JR(1994), Lipworth L(1995), Cold S, Hansen S, Overvad K, Rose C,(1997), Chen I, Krieger EB(1995), Lawlor DA, Smith GD, Ebrahim S.,(2004*),

Occupation:
No relation was found between cases and controls and occupation. This partly goes in harmony with education as occupation is always related to education and partly due to culture factors of the Saudi women.

Marital status:
Ebrahimi,M., Vahdaninia, M., and Montazeri, A.,(2002) who found more cases than controls were un-married but it was not statistically significant. *Rosner B, Colditz GA, Willett WC (1994)* stated that never married women are at higher risk for breast cancer. This contradicts our result and can be explained by cultural differences .

BMI
Pike MC. (1983), reported that BMI equal or more than 25 was associated with increased breast cancer risk in both previous reports. This is in contrast with our result. This may be due to small sample size. Fat tissue produces excess amounts of estrogen, high levels of which have been associated with the risk of breast, endometrial, and some other cancers.

Age of menarche:
This study shows that Age of menarche of cases significantly younger than that of the control group (t= 2.138). This agrees with the results of *Butt,Z. etal (2009),* who stated that Case and

controls did not differ in age at menarche, although *Andreas, etal,(2010),* reported that a higher proportion of cases than controls in relation to early menarche (14.2% vs. 11.4%). Younger age of menarche exposes the breasts to the effect of estrogen for a longer period of life.

Regarding number of children, age at menopause and age at first delivery our study confirmed that there were no statistically significant differences between these factors of the cases and control group the was obtained by *Butt, Z et.al.(2009).* The present research showed that the cancer cases breast fed their children for a shorter duration than the controls *Andreas, et.al. (2010)* declared that, no evidence of effect modification in the relationship of breast cancer and number of children by breastfeeding status. Further adjusting for other variables revealed no association with parity while interestingly wide confidence intervals were observed. He also stated that there was no statistically significant difference between cases and control group regarding number of children.

Breast self examination:

Less of cancer cases than their controls examine their breast though not significant, the estimated relative risk. Nearly 70% of all breast cancers are found through self-exams and with early detection the 5-year survival rate is 98%. *Fakhro et al. (1999)* stressed the urgent need for improved screening techniques for early detection and to improve women's awareness of breast cancer in Bahrain. The estimated relative risk of previous breast biopsy was 2.583.

History of use of oral contraceptive pills was more likely among cases than controls (68.75% compared to 42.31%) with an estimated relative risk of 3. Women diagnosed with breast cancer were asked whether they had used OCs for more than 6 months before diagnosis and, if so, whether the most recent use had been within 5 years, 5 to 10 years, or more than 10 years. The results indicated that the risk was highest for women who used OCs within 5 years prior to diagnosis, particularly in the younger group (*Althuis MD, Brogan DD, Coates RJ, et al. 2003).*

About one third (31.25%) of cancer cases reported that their meals do not contain fruits and vegetables compared to only 7.69% of their controls with an estimated cancer risk 5.455. Eating fruits and vegetables have a protective effect against cancer breast and other cancers reducing oxidative damage of DNA or increasing the activity of enzymes able to detoxify carcinogens.

Lack of physical exercise among cancer cases though not significant, yet, the estimated cancer risk is 14.17. Regular exercise and a diet that is low in fat and high in fruits and vegetables lowers the levels of estradiol and estrone, two kinds of estrogen. Although women need estrogen to mature and to create strong bones, overexposure to estrogen can lead to breast cancer. Eighty percent of all breast cancers are fueled by estrogen. Exercise is a natural way to reduce your estrogen levels, as well as reducing other hormones and growth factors that can cause breast cells to turn into cancer(*Stephan P.,2011)*

CONCLUSION

Estimated cancer risks detected by this research are lack of physical exercise (14.17), don't eat vegetables or fruits (5.455), use of oral contraceptive pills (3.00), self examination of the breast (4.822) and breast biopsy whenever indicated (2.583),and younger age of menarche.

RECOMMENDATION

1. Based on the findings of this study the following recommendations can be suggested:
2. Further studies on a large sample size for generalization.
3. Awareness program for women about breast awareness should be initiated.
4. Health promotion should be provided through healthy guidelines.
5. Nutritional education programme focusing on healthy diet and the importance of eating fresh vegetables and fruits.
6. Physical exercise should be part of the life style that should start early in life and in schools.

REFERENCES

Butt, Z. et al, **Reproduction risk factors for female breast cancer: a case control study**. ANNALS Vol 15. No.4 Oct. - Dec. 2009.

American Cancer Society Website. **Overview: breast cancer-what is breast cancer? Available at:** http://www.cancer.org/docroot/CRI/content/CRI_2_2_1X_What_is_breast_cancer_5.asp Accessed September 2, 2008.

American Cancer Society. Breast Cancer Facts & Figures 2005-2006. Atlanta, Ga: American Cancer Society, Inc; 2005.

Tarone RE: **Breast cancer trends among young women in the United States.** *Epidemiology (Cambridge, Mass)* 2006, 17(5)**:**588-590.

Registry NC: **Cancer Incidence Report Saudi Arabia 2002.** *Riyadh* 2007.

Denic S, Al-Gazali L. BRCA1 and BRCA2. **Mutations in breast cancer patients from Saudi Arabia.** Saudi Med J. 2003; 24(6):696; author reply 696-7. PMID: 12847614

Denic S, Bener A. **Consanguinity decreases risk of breast cancer--cervical cancer unaffected.** Br J Cancer. 2001; 85(11):1675-9. PMID: 11742487

Bener A, Honein G, Carter AO, Da'ar Z, Miller C, Dunn EV. **The determinants of breast cancer screening behavior: a focus group study of women in the United Arab Emirates.** Oncol Nurs Forum. 2002; 29(9):E91-8. PMID: 12370705

Ravichandran K, Al-Zahrani AS. **Association of reproductive factors with the incidence of breast cancer in Gulf Cooperation Council countries**. East Mediterr Health J. 2009;15(3):612-21. PMID: 19731777

Fakhro AE, Fateha BE, al-Asheeri N, al-Ekri SA. **Breast cancer: patient characteristics and survival analysis at Salmaniya medical complex, Bahrain**. East Mediterr Health J. 1999; 5(3):430-9. PMID: 10793821.

Andreas, etal. **An investigation of breast cancer risk factors in Cyprus: a case control study**.2010,

Hadjisavvas etal, BMC cancer, http://www.biomedcentral.com/1471-2407/10/447.

Ebrahimi,M., Vahdaninia, M., and Montazeri, A., **Research article Risk factors for breast cancer in Iran: a case-control study,** Breast Cancer Research,(2002): Vol 4, Issue 5.

Ozmen,V.,etal, **Breast cancer risk factors in Turkish women –** a University Hospital based nested case control study, *World Journal of Surgical Oncology* 2009, **7**:37 .

Negri E, Braga C, Vecchia CL, Levi F, Talamini R, Franceschi S: **Lactation and the risk of breast cancer in an Italian population.** *International J Cancer* 1996, **67:**161-164.

Tavani A, Braga C, Vecchia L: **Attributable risk for breast cancer in Italy: education, family history and reproductive and hormonal factors.** 1997, **70:**159-163.

Rosner B, Colditz GA, Willett WC: **Reproductive risk factors in a prospective study of breast cancer: the Nurses' Health Study.** *Am J Epidemiology* 1994, **139:**819-835.

BraatenT, Weiderpass E, Kumle M, Adami HO, Lund E: **Education and risk of breast cancer in the Norwegian-Swedish women's lifestyle and health cohort study.** *Int J Cancer* 2004, **110:**579-583.

Tavani A, Gallus S, La Vecchia C, Montella M, Dal Maso L, Franceschi S: **Risk factors for breast cancer in women under 40 years.** *Eur J Cancer* 1999, **35:**1361-1367.

Velentgas P, Daling JR: **Risk factors for breast cancer in younger women.** *Monogr Nate Cancer Inst* 1994, **16:**15-22.

20-Lipworth L: **Epidemiology of breast cancer.** *Eur J Cancer Prev* 1995, **4:**7-30.

21-Cold S, Hansen S, Overvad K, Rose C: **A woman's build and the risk of breast cancer.** *Ann Epidemiol* 1997, **7:**375-382.

Chen I, Krieger EB: **Breast cancer. Does it matter?** *Health* 1995, **5:**13-14.

Lawlor DA, Smith GD, Ebrahim S: **Hyperinsulinemia and increased risk of breast cancer: findings from the British women's hearth and health study.** *Cancer Causes and Control* 2004, **15:**267-275.

Pike MC, Krailo MD, Henderson BE, Casagrande JT, Hoel DG: **Hormonal risk factors, breast tissue age and the age incidence of breast cancer.** *Nature* 1983, **303:**767-770.

Althuis MD, Brogan DD, Coates RJ, et al. **Breast cancers among very young premenopausal women (United States).** ***Cancer Causes and Control*** 2003; 14(2):151–160.

Stephan., About.com Guide Updated December 30, 2011, **About.com Health's Disease and Condition content is reviewed by the** *Medical Review Board*