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Socio-economic and Demographic Factors Affecting the Incidence Sudanese Females with Breast Cancer

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Abstract:

This Study aims at finding the socio-economic factors affecting incidence Sudanese females with breast cancer and testing the validity of some relations between patients and control group. The study depended on the data from database of Statistical Information and Research Center at Radiation and Isotopes Center in Khartoum (RICK). The sample size of the study was (165) for each group patients and control. Variables measured on breast cancer patients tested by using chi-square test. The important results of the study are: the most significant factors affecting the incidence Sudanese female with breast cancer are: menopause status, breast feeding, first full term pregnancy, contraceptive use, benign breast biopsies, and body mass index. (20.6%) of women had breast cancer and their relatives also had a breast cancer, despite of the significant difference between the patients and control group according to the family history of breast cancer. (26.1)% and (22.4%) of patients and control group their age was more than 50 years, and (81.8%) of patients their level of anxiety was normal and only(3%) of them are in high level of anxiety. The study recommended that , early diagnosis and screening should be carried out, specifically targeted towards breast cancer.

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1. Introduction:

Cancer is a disease that starts in out cells. Our bodies are made up of millions of cells, grouped together from organs or tissues such as the lungs,the liver, muscles and bones.

The breasts are the most important sign of the feminity, fear of its disease has devastating psycho-emotional effect on the victims. Breast cancer is the most common type of cancer and leading cause of death among women worldwide. In fact, one in three women diagnosed with cancer will be diagnosed with breast cancer (Richard,2000)

The natural history of breast cancer consists of three stages of disease manifestation. In the first stage, the extent of the cancer is localized to the breast area. We say the tumor is in the local stage. The second stage Manifests itself with the spread o f the cancer cells to some close neighborhood of the breast. The spread is Regional and is generally located in the lymphatic nodes. Therefore, this stage is called regional or nodal. In the last stage, the disease spreads to a distant organ, like the liver, brain or lungs. This is the so-called metastatic or distant stage. The primary breast cancer tumor is rarely the cause of breast cancer death. The failure of some distant vital organ due to metastasis causes the breast cancer death. Clinical practice is to surgically remove the primary tumor immediately at detection in order to reduce the chance of metastatic spread and breast cancer death (Richard ,2000).

Upon detection of the primary breast cancer, a patient undergoes an exam that determines the stage of the disease. From our standpoint, we consider the time of, say, the onset of regional stage, as the earliest time at which nodal involvement can be detected by a standard exam. It must be understood that if a tumor is staged as local it does not mean that there is no spread in the lymphatic nodes. There may be an undetectable amount of cancer cells in the nodes.

The areas in Sudan where cancer is prevalent are, Northern States, Khartoum, Gezira, Kordufan, Darfor and the other cases from other states as Southern and Eastern states.

Most of these patients come from Northern and Eastern States. The most common cancer for females in Sudan is breast cancer (34.5%) and esophageal cancer in males (11%). Because these numbers are reaching epidemic proportions, it is vastly important topic to consider (RICK,2003). From (WHO) in 2005 cancer killed approximately 22000 people in Sudan 17000 of these people were under the age 70. In 2002 breast cancer is the most common cancers found in women in Sudan and in 2005 breast cancer is the leading cause of cancer deaths for Sudanese women. Any women may develop breast cancer. However, the following risk factors may increase the likelihood of developing the disease. Both genetic and environmental factors are believed to play a role in a woman's risk of developing breast cancer. If either a woman's mother or sister has breast cancer, the woman's risk increases about two to three times. Having both a mother and a sister with breast cancer increases a woman's risk up to six-fold. If that relative had bilateral breast cancer or was diagnosed at an early age, the risk may be further increased . In small groups of families, the patterns of breast cancer incidence seem to be consistent with known patterns of genetic inheritance .

Sudan is a vast country with an area of 2.5 million square kilometres, it is bounded on the east by the Red Sea and on the other sides by nine African nations: Eritrea, Ethiopia, Kenya, Uganda, Zaire, Central African Republic , Chad, Libya and Egypt. It is administratively divided into 104 provinces which are grouped into 26 states.

There has been no population based cancer registry in Sudan, registration activity has been confined to a hospital based registry based on record of patients attending the oncological hospital, the Radiation and Isotope Cancer, Khartoum and the Sudan cancer registry based on histopathologically confirmed cases diagnosed in the National Health Laboratories in Khartoum (Parkin,2003).

Early report presented data on histopathologically confirmed cases. Mickey 1959, described 1335 malignant epithelial neoplasm collected from the Stack Medical Research Laboratories during the period 1935-1954.

Lynch, 1963 published a report on 2234 malignant tumors collected from the same source and from the department of pathology, University of Khartoum, for the period 1954-1961. This series was reproduced by Daoud , et al (1968) and compared with 1578 malignant tumors from Khartoum district examined at the department of pathology in 1957-1965.

Data from the pathology based Sudan Cancer Registry for 1978 were published by Mukhtar (1986). Breast cancer was the dominant tumour (26% tumour is females). Other cancer for particular interest of this series was nasopharynx cancer, the relative importance of which, especially i n males, was described previously (Hidayatalla,1983), eye tumors which are mainly epithelial tumors of conjunctive (Malik,1979).

Hidayatalla (1968) published a series of 10410 cases seen in the Radiation and Isotope Cancer for the year 1967-1984. The distribution of cases is on the whole similar to that Sudan Cancer Registry, with some bias towards the more radiosensitive tumors (of the breast and nasopharynx). There is relatively high incidence of breast cancer observed in the Sudan. It also increases rapidly. In 1999 there were 321 new cases of patients and increased to 606 in 2003 (RICK,2005).

Despite significant research advances, the causes of the disease are not yet

fully understood, there is no known cure and there is some debate within the medical profession about the most appropriate methods of treatment. Although breast cancer cannot be prevented, its natural progress may be interrupted by early detection and treatment. The results of trials indicate that the risks of death in the female population can be reduced by up to 50% through mass screening by mammography which can detect unplayable and asymptomatic tumors and thereby enables the problem to be treated earlier than would otherwise have been the case, and hopefully before the cancer had metastasized (Shapiro, S.1986).

H.Gage and R.Fouquet(1996) conducted study about Exploring breast cancer mortality in England: the effect of socio-economic factors and health caring, the study found that socio-economic and behavioural factors had alarger effect on mortality than health car inputs.

Yusra(2014) did aresearch about breast cancer in the United Arab Emirates(UAE). The results showed : the significant influnce of social and cultural factors and life expectations on women with breast cancer,the importance of cultural and psychosocial beliefs in women's decision to seek medical attention, and the relatively younger age at diagnosis in Arab women compared to westeren women indicates a need to start clinical screening at younger ages.

Alow level education and low socio-economic status leads to poor uptake of screening by women.Women with low -socio-economic are more likely to be diagnosed with advanced breast cancer compared to more economically privileged women (Miller et al.,2002). Regardless of age or ethinicity, poverty has a strong

Effect On probability of bieng diagnosed at an advanced stage(Campbell et al.,2009).

Some studies investigated the demographic factors of women presenting late for medical treatment, it was observed that women were more likely to be diagnosed in later stages if they were older 50years and above (Ali et al.,2008).

On the other side Alhurishi et al.(2011) found that there is strong evidence supporting the effects of older age and lower educational level on late investigation and presentation.

2. Study Objectives:

The objectives of the Study are:

1. To Explain the the socio-economic and demographic factors affecting incidence Sudanese females with breast cancer risk factors.
2. To reveal the concept of breast cancer through statistical function.
3. To test the validity of the some relations of patients and control groups.

3. Methodology:

In this research we applied descrptive statistics to the breast cancer data . Data were analyzed by using the Statistical Package for Social Science (SPSS) and stata10 .

3.1. The Source of Data:

A questionnaire was launched for data collection from patients and control group depending on the database of Statistical Information and Resesrch Center at Radiation and Isotopes Center in Khartoum (RICK) for the year 2015. The questionnaire was designed to collect data on the risk factors variables.The focusing on female breast cancer patients diagnosed during the period of the study. Areas of control group were selected randomly.

3.2 Statistical Analysis:

The data were collected for 165 patients and 165 controls, for all the variables in the questionnaire (divided into a number of groups) variables measured on breast cancer patients were tested using chi-square test.

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4 Results

4.1 Analysis of quantitative variables:

Descriptive statistics is done separately for the patients and controls and from the results we find that: The age of respondent of patients ranged from 24 to 76 years with (mean ± S.D) (43.95 ± 10.35) and median 42 years. 67.3% of all patients belonged to the age group 40 and above, 32.8% belonged to the age group (20 - 39) years. The age of respondent of control group ranged from (mean ± S.D) (43.10 ± 10.06) 26 to 78 years with years and median 42 years. The different between the mean age of the two groups was not statistically significant (p-value = 0.429), the age in two groups was matched for.

Information regarding age at menstrual cycle begining was available for all the patients and control. Mean age at menstrual cycle begin was found to be (13.93 ± 1.27) years for patients with (median = 14) years and (13.55 ± 1.03) years for controls with (median = 13) years. The difference between the mean age at menstrual cycle begin was statistically significant (p-value = 0.003).

For the age at menopause data were collected for all the patients and controls. The mean age at menopause was (43.95 ± 5.79) years (median = 45) for patients and (37.93 ± 9.30) years (median = 39) for controls. The difference between the two means was statistically significant (p-value = 0.000).

For the body mass index, patients with mean body mass index (25.30 ± 4.92) and for control with mean body mass index (27.67 ± 5.37), median for patients 24.8 while for control is 26.7. The difference between the two means was statistically significant (p-value = 0.000).

Age at first full term pregnancy ranged from 15 to 32 years with (mean ± S.D) (22. 40 ± 4.53) and median 22 for the patients. The age at first term pregnancy of control group ranged from 17 to 33 with (mean ± S.D) (22.72 ± 4.16) years and median 23 years. The difference between the means age of the two groups was not statistically significant (p-value = 0.233).

Anxiety scale have seven questions and four items in each question of scale. Each item had been answered by the patients and control on a four point (0 - 3) response category so the possible scores ranged from 0 to 21 for anxiety. For analysis, score (0 - 7) could be ranged as being in the normal range, score (8 - 10) ranged in low level of anxiety (me be) and score (11 and more) indicating probable presence of the mood disorder

(High level of anxiety) (Zauber, AG, Warshauer, ME, Harlap, S, Shapiro, S,1996).

Anxiety score of patients ranged from 1 to 13 with mean (5.05 ± 2.21) and median 5. 81.8% of all patients was normal and just 3% of them are in high level of anxiety. The anxiety score of control group ranged from 0 to 14 with mean (4.74 ± 2.75) and median 5. The difference between the mean of the two groups was not statistically significant (p-value = 0.258). For this result its better to ask women before they diagnosed as a breast cancer women.

4.2 Analysis of qualitative variables:

The preliminary analysis of the data set was carried out. The comparisons between two groups (cases and control) of data made for all the independent variables. The categorical independent variables were arranged in tables and chi-square tests were applied to compare the difference between cases and control.

Family history of breast cancer: from table (1), (79.4%) of patients and (87.3%) of controls respectively their reply "no", which mean they had no history with breast cancer in their family, for patients (20.6%) their answer was "yes" they (have a history of breast cancer) while (12.7) for control said yes they (have a history of breast cancer). The difference between patients and control is statistically significant according to family history of breast cancer (p-value = 0.038) Significant level, very low percentage of women (20.6%) had a cancer while their relatives also had a cancer.

Table (1):Distribution of Patients and Control According to Family History of Breast Cancer

Family history of breast cancer	Patients		Control		Total		P.Value
	F	%	F	%	F	%	
No	131	79.4	144	87.3	275	83.3	0.038
Yes	34	20.6	21	12.7	55	16.7	
Total	165	100%	165	100%	330	100	

Source: SPSS and Stata10 software output * F=(Frequencies)

Hormone replacement therapy (HRT): from table (2), (53.3%) of patients had a hormone replacement therapy and (46.7%) are not, for control (91.5%) did not treated by hormone replacement therapy and

(8.5%) had treated. The difference between the distribution of patients and control according to hormone replacement therapy is statistically significant (p-value = 0.000).

Table (2):Distribution of Patients and Control According to Hormone Replacement Therapy

HRT	Patients		Control		Total		P.Value
	F	%	F	%	F	%	
No	77	46.7	151	91.5	228	69.1	0.000
Yes	88	53.3	14	8.5	102	30.9	
Total	165	100%	165	100%	330	100	

Source: SPSS and Stata10 software output * F=(Frequencies)

Menstrual cycle begins: from (3), (79.4%) and (85.5%) of patient and control respectively had not early menstrual cycle begin (menstrual cycle > 12 years). (20.6%) of patients had early menstrual cycle and (14.5%) of control had early menstrual cycle (menstrual cycle <= 12). The difference between the two groups was statistically significant at 0.1 level (p-value = 0.096).

Table (3):Distribution of Patients and Control According to Menstrual Status

Menstrual Status	Patients		Control		Total		P.Value
	F	%	F	%	F	%	
Not Early>12	131	79.4	141	85.5	272	82.4	0.096 *
Early=<12	34	20.6	24	14.5	58	16.6	
Total	165	100%	165	100%	330	100	

Source: SPSS and Stata10 software outputs *F=(Frequencies)

Menopause status: from table (4), (66.1%) of patients and (15.8%) of control were premenopausal, while (33.9%) of patients and (84.2%) of control were postmenopausal. The difference between the two groups with regard to menopausal status statistically was significant (p-value = 0.000).

Table (4):Distribution of Patients and Control According to Menopause Status

Menopause Status	Patients		Control		Total		P.Value
	F	%	F	%	F	%	
No	56	33.9	139	84.2	195	59.1	0.000
Yes	109	66.1	26	15.8	135	40.9	
Total	165	100%	165	100%	330	100	

Source: SPSS and Stata10 software outputs * F=(Frequencies)

Parity: from table (5), for patients (42.4%) have more than five children, (36.4%) have five or less children, (10.3%) are null parsous and (10.9%) were single (never married). For control groups (26.1%) have a more than five children, (66.7%) have five or less children, (4.8%) were null parsous and (2.4%) were single. The difference between patients and control group with regard to parity statistically is significant (p-value = 0.000).

Table (5):Distribution of Patients and Control According to Parity

Parity	Patients		Control		Total		P.Value
	F	%	F	%	F	%	
Nullparsous	17	10.3	8	4.8	25	7.6	0.000
<= 5	60	36.4	110	66.7	170	51.5	
> 5	70	42.4	43	26.1	113	34.2	
Single	18	10.9	4	2.4	22	6.7	
Total	165	100%	165	100%	330	100%	

Source: SPSS and Stata10 software output * F=(Frequencies)

Breast-feeding: From table (6), most of patient and control had breasted feeding (90.9%) and (71.5%) respectively. Women had no breast-feeding for patients are (9.1%) and (28.5%) for control group. The difference between the two groups was statistically significant (p-value = 0.000).

Table (6):Distribution of Patients and Control According to Breast Feeding

Breast feeding	Patients		Control		Total		P.Value
	F	%	F	%	F	%	
Yes	150	90.9	118	71.5	268	81.2	0.000
No	15	9.1	47	28.5	62	18.8	
Total	165	100%	165	100%	330	100	

Source: SPSS and Stata10 software outputs * F=(Frequencies)

First full term pregnancy: from table (7), (34.5%) of patients their age at first full time pregnancy was less than (20) years, (40%) of patient belong to the age group (20 - 29) years, (4.3%) more than (30) years, (10.3%) are null parous and (10.9%) were single. (33.3%) of control below (20) years, (54%) ranged (20 - 29) years, (6.1%) more than (30) years, (4.2%) null parous and (2.4%) were single. The difference between patients and control with regard to age at first full term pregnancy was statistically significant (p-value = 0.003).

Table (7):Distribution of Patients and Control According to Age at First Full Term Pregnancy

Age at first full term pregnancy	Patients		Control		Total		P.Value
	F	%	F	%	F	%	
Below 20 years	57	34.5	55	33.3	112	33.8	0.003
20 – 24 years	39	23.6	59	35.8	98	29.7	
25 – 29 years	27	16.4	30	18.2	57	17.3	
> = 30	7	4.3	10	6.1	17	5.2	
Nulliparious	17	10.3	7	4.2	24	7.3	
Single	18	10.9	4	2.4	22	6.7	
Total	165	100%	165	100%	330	100%	

Source: SPSS and Stata10 software outputs * F=(Frequencies)

Contraceptive use: from table (8), (60%) of patients and (43.6%) of control never used contraceptive use. For patients and control respectively (40%) and (56.4%) had used contraceptive use. The difference between the distribution of patients and control according to contraceptive use is statistically significant (p-value = 0.002).

Table (8): Distribution of Patients and Control According to Contraceptive Use

Contraceptive use	Patients		Control		Total		P.Value
	F	%	F	%	F	%	
No	99	60	72	43.6	171	51.8	0.002
Yes	66	40	93	56.4	159	48.2	
Total	165	100%	165	100%	330	100	

Source: SPSS and Stata10 software outputs * F=(Frequencies)

Breast density (size): from table (9), for patients (58.2%) had a medium size of breast, (27.9%) had a small size and (13.9%) had a large size of breast. For control group (70.3%) had a medium size of breast (16.4%) had a large size of breast and (13.3%) had a small size of breast. The difference between patients and control with regard to breast density (breast size) is statistically significant (p-value = 0.005).

Table (9):Distribution of Patients and Control According to Breast Density (Size)

Breast density (size)	Patients		Control		Total		P.Value
	F	%	F	%	F	%	
Small	46	27.9	22	13.3	68	20.6	0.005
Medium	96	58.2	116	70.3	212	64.2	
Large	23	13.9	27	16.4	50	15.2	
Total	165	100%	165	100%	330	100	

Source: SPSS and Stata10 software output F=(Frequencies *)

Benign breast biopsies: from the below table (10), for patients and control (91.5%) and (86.1%) respectively did not have previous benign biopsy. (8.5%) of patients and (13.9%) of control group have previous benign biopsy. The difference between the distribution patients and control according to benign breast biopsy statistically significant at 0.1 level (p-value = 0.081)

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Table (10):Distribution of Patients and Control According to Benign Breast Biopsies

Benign breast biopsies	Patients		Control		Total		P.Value
	F	%	F	%	F	%	0.081 *
No	151	91.5	142	86.1	293	88.8	
Yes	14	8.5	23	13.9	37	11.2	
Total	165	100%	165	100%	330	100	

Source: SPSS and Stata10 software outputs * F=(Frequencies)

Body mass index (BMI): from table (11), Body mass index divided to four groups, less than 18.9 is under weight, (18.9 - 24.9) is normal, (25 - 29.9) is over weight and (30 or more) define as obesity. This study showed (44.8%) were normal, (35.2%) over weight, (12.1%) obesity, and (7.9%) under weight of patients. From the same table also (30.3%) of control group were normal, (33.9%) over weight, (20.9%) obesity, and (7%) under weight. The difference between patients and control according to body mass index is significant at 0.05 level (p-value = 0.000).

Table (12):Distribution of Patients and Control According to Body Mass Index (BMI)

Body mass index (BMI)	Patients		Control		Total		P.Value
	F	%	F	%	F	%	
Under weight	13	7.9	10	14.9	23	7.0	0.000
Normal	74	44.8	50	30.3	124	37.6	
Over weight	58	35.2	56	33.9	114	34.5	
Obesity	20	12.1	49	20.9	69	20.9	
Total	165	100%	165	100%	330	100%	

Source: SPSS and Stata10 software output * F=(Frequencies)

Age groups: from table (13),the age of patients ranged from 24 to 76 years,and the age of control is ranged from 26 to 78. 26.1% of patients in group (30 - 39) years , 30.3% of control in the same group with. 41.2% Patients in group (40 - 49) years , 40.6% of control in the same group. For patients , 6.7% in group (20 - 29) years and also the same percentage for control group. Finally 26.1% patients their age was more than 50 years and 22.4% of control their age was more than 50 years. The difference between patients and control with regard to age groups was not significant (p-value = 0.805). Control group matched with patients group for age at diagnosis.

Table (13):Distribution of Patients and Control According to Age Groups

Age groups	Patients		Control		Total		P.Value
	F	%	F	%	F	%	
20-29	11	6.7	11	6.7	22	6.7	0.805
30-39	43	26.1	50	30.3	93	28.2	
40-49	68	41.2	67	40.6	135	40.8	
>= 50	43	26.1	37	22.4	80	24.2	
Total	165	100%	165	100%	330	100	

Source: SPSS and Stata10 software outputs * F=(Frequencies)

Conclusion:

From the statistical analysis for the data, study revealed some results, the important of them are:

1.The most significant factors affecting the incidence Sudanese female with breast cancer are: menopause status, breast feeding,first full term pregnency, contraceptive use, benign breast biopsies, and body mass index(BMI).

2.For patients group there (26.1)% their age was more than 50 years and (22.4%) of control group their age was more than 50 years.

3.Anxiety score of patients ranged from 1 to 13 with mean (5.05 ± 2.21) and median 5. 81.8% of all patients was normal and only(3%) of them are in high level of anxiety.

4.most of patient and control had breasted feeding (90.9%) and (71.5%) respectively.

5. patients and control (91.5%) and (86.1%) respectively did not have previous benign biopsy.

6.patients and control group with regard to anxiety scale represent that most of patients and control are in the normal level (81.8%) and (83.7%) respectively.

7.The difference between patients and control group with regard to parity was significant.

8.The difference between patients and control groups according to body mass index is significant at 0.05 level (p-value = 0.000).

9.The difference between patients and control is significant according to family history of breast cancer (p-value = 0.038).

10. There were (35.2%) of patients group and (33.9%) of control group obtained over weight.

11. (20.6%) of women had breast cancer and their relatives also had a breast cancer, despite of the significant difference between the patients and control group according to family history of breast cancer.

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