RESEARCH ARTICLE

Multiparity and Breast Cancer Risk Factor among Women in Burkina Faso

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Abstract

The relative lack of information on breast cancer etiology in Burkina Faso led us to undertake the present work to highlight risk factors. This prospective study was conducted using a questionnaire between January 2015 and February 2016 on women admitted to Yalgado OUEDRAOGO hospital, for consultation or supervision. The characteristics of multiparous breast cancer patients (n = 44) were compared with their non-multiparous counterparts (n = 36). The study found that increased risk of breast cancer among non-multiparous cases was related to body mass index (BMI) ($p < 0.001$), age at menopause ($p < 0.004$) and use of oral contraception ($p < 0.021$) while abortion ($p < 0.002$) was a risk factor among multiparous cases. These results suggest that even if multiparity is associated with a decreased risk in some women, avoidance of abortion during reproductive life should be recommended. The results provide preliminary information, which now need to be supplemented by survey of a larger sample in the national territory.

Keywords: Breast cancer- risks factors- multiparty- Burkina Faso

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Introduction

Breast cancer is the most common diagnosed cancer in Africa and Sub-Saharan Africa, and the first leading cause of death from cancer (63,100 deaths in 2012) (Globocan, 2012). In Burkina Faso, the expected number of new breast cancer cases in the years 2012 and 2015, was respectively 1144 and 1200 with an incidence of 18.1% and this disease is the most common cancer among women (Parkin, 2012; Plan stratégique de lutte contre le cancer 2013-2017, 2013). The exact causes of breast cancer are not yet fully known, but the evidence from a large number of studies worldwide is a wide variety of risk factors. These factors include increasing age, geographic location, family history, reproductive factors (first menarche at less than 11 years of age, late menopause after age 55, nulliparity, first pregnancy before 30 years of age), carcinoma of the uterus, ovarian carcinoma, dietary factors (a diet rich in animal fat), exogenous hormones - oral contraceptives, alcohol (more than 2 drinks per day), post-menopausal obesity (Timothy et al., 2001; Yip et al., 2006). Multiparity could be especially considered as protective but some studies have shown a low protective effect. Several mechanisms by which multiparity influences the risk of breast cancer are known or suspected (Kantelhardt, 2015). In fact, women who have at least one full-term pregnancy before the age of 30, have on average a 25% reduced risk of breast cancer compared with nulliparous women. The protective effect of multiparity appears to increase as the number of deliveries. Women with eight or nine deliveries have about 30% reduced risk compared to those with five births (Nkondjock and Ghadirian, 2005).

Since breast cancer is a public health problem, it is necessary to carefully evaluate risk factors.

According to statistics from Burkina Faso Demographic and Health and Multiple Cluster Indicator Survey at 2010, Burkinabe women's fertility is still high since each woman gives birth to six children on average at the end of their reproductive life. The aim of our study was to investigate the breast cancer risk factors in multiparous women in Ouagadougou and determine the dimension of nulliparity, primiparity or pauciparity risk associated with breast cancer in women.

Materials and Methods

Study settings and sampling

This was a single-center, prospective cross-sectional

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study from January 2015 to February 2016. The study population consisted of 80 women with breast cancer and histologic diagnosis. All patients were recruited during their consultations at the oncology unit of General and Visceral Surgery Department of University Hospital Yalgado OUEDRAOGO (CHU-YO) in Ouagadougou, Burkina Faso, after informed consent was obtained. A data collection form was used for socio-demographic, clinical and para clinical characteristics.

The database included patient age, number of pregnancies, parity, induced abortion, menarche, menopausal status, menstrual cycle, histological type, cancer staging, oral contraception, the obesity, family history of breast cancer or other cancer, profession and residence. A woman with four (4) to six (6) deliveries were considered as simple multiparous, while a grand-multiparous had at least seven (7) and more childbirths. Nulliparous (no delivery), primiparous (one childbirth) and pauciparous (two to three deliveries) were designated as non-multiparous. The patient's residence was determined as suggested by the National Institute of Statistics and Demography (INSD): urban if women live in the city (capital of the province or urban municipality status) with more than 10,000 inhabitants and rural if community size was smaller. Obesity has been assessed using the BMI, calculated by dividing person's weight in kilograms by the square of height in meters (kg/m2). According to the criteria of the National Cancer Institute/ National Heart, Lung and Blood Institute (NCI/NHLBI) in United State of America, women were classified as obese when BMI ≥30 kg/m^2, overweight when 25 < BMI > 30 kg/m2 and normal/underweight if BMI < 25 kg/m^2.

Statistical analysis

Data were arranged and organized by using Microsoft Office Excel 2007 software. Statistical analyses were performed using the software Statistical Package for Social Sciences (SPSS) 21.0. The chi-square test was used for comparison. The difference was significant at $p < 0.05$.

Results

Our study population consisted of 80 women of the 87 patients received in oncology consultation during the study period. The turnout was 92.00% and multiparous were 44 (55.0%) (Table 1).

Over 40 years of age at diagnosis was found in 77.0% of multiparous patients and 44.5% of non-multiparous. There was no significant difference ($p = 0.222$) (Tableau 2).

In regards to body Mass Index, overweight was found in 8 multiparous patients (18.2%) and 17 non-multiparous patients (47.2%). We found a significant difference ($p = 0.011$) between these two groups of patients (Table 2).

Otherwise, induced abortion was found in 59.10% of multiparous and 25.00% of non-multiparous patients. There was a significant difference ($p = 0.002$) between abortion practice in multiparous and non-multiparous (Table 2).

In regards to menopausal status, the post-menopausal at diagnosis were 30 (68.2%) in multiparous patients and 13 (36.1%) among non-multiparous patients (Table 2). There was a significant difference of menopausal status at diagnosis between the two groups ($p = 0.004$).

Our results show that some patients in both groups adopted oral contraception. The oral contraception was found in 25.0% of multiparous and 50.0% of non-multiparous patients and a significant difference ($p = 0.021$) was found between the two groups of patients.

In addition, in the patient profession item, we also found a significant difference ($p < 0.000$) between profession especially more housewives (77, 3%) in multiparous patients (Table 2).

Finally, in clinical and histological type, the results of our study show that in clinical and histological type characteristics, no difference was significant for all variables. Thus the side of affected breast, the tumor grade, histologic type, stage of disease might not be related to multipare patient status or not (Table 3).

We wanted to demonstrate if a family history of cancer was not the real cause of breast cancer in multiparous and/ or non multiparous. In summary, no significant difference was found because of family history with the parity of the patients (Table 4).

Discussion

Like any small sample size study we are aware of biases directly related to statistical power, which is mainly determined by the number of cases. For this last point, it is worth noting that it was difficult to identify women examined spontaneously, because the cancer management in Burkina Faso, is still on the way of perfection. However, given the difficulties encountered we believe that despite the relatively small size of the sample, preliminary results are reasonable and encouraging.

Our study reveals a majority of multiparous cases (55.0%), which raises many questions. Our proportion of multiparous does not differ from those of Sanon et al., (1998), who found 54.0% of multiparous among women with breast cancer in Burkina Faso. Other studies report significant proportions of multiparous patients (9.7%) in Cameroon (Engbang et al., 2015) and 12.9% in a study in Mali (Togo et al., 2010). Indeed, nulliparity is considered as a risk factor, and several studies have demonstrated the protective role of multiparity (Aubry et al., 1991). Unfortunately, women lose this protection after menopause and they are more at risk of developing breast cancer (Sanon et al., 1998). Which could explain the proportion of multiparous with breast cancer in our study; especially 68.2% of these patients were multiparous with postmenopausal status.

Multiparity is often reported to reduce breast cancer

Table 1. Proportion of Multiparous

Characteristics	N=80 n (%)	Proportion N=80 n (%)
Nulliparous	5 (6.2%)	
Primiparous	3 (3.7%)	36 (45.0%)
Pauciparous	28 (35.0%)	
Multiparous	21 (26.2%)	
Grand Multiparous	23 (28.7%)	44 (55.00%)

Table 2. Sociodemographic Characteristics and Anthropometric Indices

Parameters	Multiparous cases N=44 n (%)	Non-multiparous cases N=36 n (%)	Total N=80 n (%)	p-value
Age				
≤ 40 ans	10 (22.7%)	20 (55.6%)	30 (37.5%)	NS p<0.222
> 40 ans	34 (77.3%)	16 (44.4%)	50 (62.5%)	
Residence				
Urban	39 (88.6%)	29 (80.6%)	68 (85.0%)	NS p<0.314
Rural	5 (11.4%)	7 (19.4%)	12 (15.0%)	
Profession				
Civil servant	7 (15.9%)	18 (50.0%)	24 (30.0%)	p<0.000
Housewives	34 (77.3%)	12 (33.3%)	47 (58.7%)	
Others	3 (6.8%)	6 (16.7%)	9 (11.2%)	
Status Matrimonial				
Married	37 (84.1%)	29 (80.6%)	66 (82.5%)	
Single	3 (6.8%)	6 (16.7%)	9 (11.2%)	NS p<0.223
Widow	4 (9.1%)	1 (2.8%)	5 (6.2%)	
Body Mass Index				
Normal/underweight < 25 kg/m^2	31 (70.5%)	14 (38.9%)	45 (56.2%)	
Overweight between 25 and 30 kg/m^2	8 (18.1%)	17 (47.2%)	25 (31.2%)	p<0.011
Obese ≥30 kg/m^2	5 (11.4%)	5 (13.9%)	10 (12.5%)	
Abortion				
Yes	26 (59.1%)	9 (25.0%)	35 (43.8%)	p<0.002
No	18 (40.9%)	27 (75.0%)	45 (56.2%)	
Menopause				
Pre	14 (31.8%)	23 (63.9%)	37 (46.2%)	p<0.004
Post	30 (68.2%)	13 (36.1%)	43 (53.7%)	
Oral contraception				
Yes	11 (25.0%)	18 (50.0%)	29 (36.2%)	p<0.021
No	33 (75.00%)	18 (50.0%)	51 (63.7%)	
Age of menarche				
≤11 years	0 (0.0%)	2 (5.6%)	2 (2.5%)	
Between 12 and 15 years	29 (65.9%)	22 (61.1%)	51 (63.7%)	NS p<0.284
>15 years	15 (34.1%)	12 (33.3%)	27 (33.7%)	
Menstrual cycle				
Regular	35 (79.5%)	25 (69.4%)	60 (75.0%)	NS p<0.299
Irregular	9 (20.5%)	11 (30.6%)	20 (25.0 %)	

NS, Non-Significant

risk in comparison with women having no children. In addition, if having multiple children actually increases risk of breast cancer for young African- American women, the higher prevalence of this factor among African Americans could serve to elevate risk for breast cancer in this population, consistent with the higher incidence of breast cancer reported for younger African- American women (Ingrid et al., 2005).

In tunisie, a study shows that, nulliparous women had higher risk for breast cancer compared to parous women. There was an insignificant decrease in risk with increasing parity number among parous women. Later age at first live birth was associated with increased breast cancer risk. Women with first live birth at 26 years of age had breast cancer as compared to women with first live birth at 20 years (Msolly and Gharbi, 2013).

As for morocco, the first pregnancy was late in 19.3% of family breast cancer (FBC) patients and 20.05% of sporadic breast cancer (SBC) patients; no significant difference between the two groups was observed. On the other hand, FBC and SBC were similar with regards to parity (27.6% of patients in the first group were nulliparous

Table 3. Clinical Characteristics and Histologic Type

Parameters	Multiparous cases N=44 n (%)	Non-multiparous cases N=36 n (%)	N=80 n (%)	p-value
Side of breast				
Left	18 (40.9%)	20 (55.6%)	38 (47.5%)	
Right	25 (56.8%)	16 (44.4%)	41 (51.2%)	NS p<0.316
Bilateral	1 (2.3%)	0 (0.0%)	1 (1.2%)	
Grade				
I	3 (6.8%)	2 (5.6%)	5 (6.2%)	
II	34 (77.3%)	22 (61.1%)	56 (70.0%)	NS p<0.190
III	7 (15.9%)	12 (33.3%)	19 (23.7%)	
Histologic type				
IDD	41 (93.2%)	33 (91.7%)	74 (92.5%)	
ILC	0 (0.0%)	1(2.8%)	1(1.2%)	NS p<0.377
Others	3 (6.8%)	2 (5.5%)	5 (6.2%)	
Stage				
I	1 (2.3%)	1 (2.8%)	2 (2.5%)	
IIA/IIB	9 (20.5%)	7 (19.4%)	16 (20.0%)	NS p<0.768
IIIA/IIIB	27 (61.4%)	25 (69.4%)	52 (65.0%)	
IV	7 (15.9%)	3 (8.3%)	10 (12.5%)	

IDD, Infiltrating Ductal Carcinoma; CLI, Invasive Lobular Carcinoma; NS, Non-Significant

Table 4. Family History of Breast Cancer or Others Cancers

Characteristics	Multiparous cases N=44 n (%)	Non-multiparous cases N=36 n (%)	N=80 n (%)	«p-value»
Family history of breast cancer				
Yes	8 (15.9%)	7 (19.4%)	15 (18.7%)	NS p<0.679
No	37 (84.1%)	29 (80.6%)	65 (81.2%)	
Family history of others cancers*				
Yes	4 (9.1%)	9 (25.0%)	13 (16.2%)	NS p<0.055
No	40 (90.9%)	27 (75.0%)	67 (83.7%)	

*Others cancers, liver; stomach; anus; lung; esophagus; uterus; ovary; NS, Non-significant

vs 26.1% in the second group) (Tazzite et al., 2013).

Finally, a study carried out among African- American finds that authors evaluated breast cancer risk in relation to parity among South African women and found patterns similar to those observed in western populations. In this study, women of mixed ethnic background with first childbirth at age 30 years or older had a twofold increase in breast cancer risk compared with women who had their first child at age 16 years or younger. In contrast, another study of nearly 2000 African breast cancer patients, reported by a Nigerian medical center, failed to identify any correlation between breast cancer risk and parity, risk and age at menarche, or risk and lactation (Alero and Lisa, 2005).

In addition, our results show that BMI could be a risk factor for non-multiparous ($p < 0.011$); abortion should be a risk factor in multiparous ($p = 0.002$); menopause is common in multiparous patients ($p < 0.004$) and finally oral contraception is a breast cancer risk factor in non-multiparous women ($p < 0.021$).

Thus, our study reveals that abortion is the only risk factor in multiparous patients. Studies have also shown that abortion was an independent risk factor for breast cancer, regardless of parity at the time of abortion compared to the first term pregnancy (Jun et al., 2015).

Although many studies have shown the protective effect of multiparity, this is not the case of our study, in which a low percentage of multiparous were expected. However, some authors such as Nkondjock et al., (2015) indicate that while multiparity has the advantage of protecting women against breast cancer, however, the reproductive period seems to have a double effect: the risk is increased immediately after birth and then gradually decreases. Pregnancy causes accelerated differentiation of breast tissue and rapid proliferation of the epithelium. The changes initiated during the first pregnancy, are accentuated by each subsequent pregnancy, and breast cancer development is related to the rate of mammary epithelial cells proliferation and inversely to the degree of differentiation (Nkondjock and Ghadirian, 2005). After this analysis of our study we advance the question is multiparity could be the only protective effect of breast cancer?

We found in general, a similarity between our results and those of African literature that show the impact of nulliparity as a risk factor of breast cancer. However,

some discrepancies were noted, probably due to specific characteristics of multiparous patients. Which will lead the scientific community to undertake specialized studies with more statistical power in order to offer better understanding and to take a preventive approach.

Authors' contributions

All authors contributed to the conduct of this work. All authors also claim to have read and approved the final manuscript.

Conflicts of Interest

The authors have declared that no competing interests exist.

References

Alero F, Lisa A, Newman D (2005). Breast Cancer in Sub-Saharan Africa: How Does It Relate to Breast Cancer in African-American Women?. *Cancer*, **103**, 8.

Aubry C, Martin E, Fournier B, et al (1991). Le dépistage précoce du cancer sein reste insuffisant : étude de la surveillance mammaire des femmes de plus de 50 ans en Lorraine-Champagne. *J Gynecol Obst Biol Reprod*, **20**, 775-82.

Engbang NJP, Essome H, Dina BE, Fonkwa F, Essame OJL (2015). Profil épidémiologique et histologique des cancers ovariens à Douala (Cameroun) : à propos de 91 cas. *J Afr Cancer*, **7**, 190-94.

Globocan (2012). Estimated cancer incidence, mortality and prevalence worldwide in 2012 disponible sur le site http://globocan. iarc.fr/Pages/bar_sex_pop_sel.aspx consulté le 05/06/2016.

Ingrid J, Hall L, Patricia G (2005). Comparative Analysis of breast cancer risk factors among African-American women and white women. *Am J Epidemiol*, **161**, 40–51.

Jun G, Yubei H, Lei Y, et al (2015). Association between abortion and breast cancer: an updated systematic review and meta-analysis based on prospective studies. *Cancer Causes Control*, **25**, 2227-36.

Kantelhardt EJ, Muluken G, Sefonias G, et al (2015). A review on breast cancer care in Africa. *Breast Care (Basel)*, **10**, 364-70.

Msolly A, Gharbi O, Slim BA (2013). Impact of menstrual and reproductive factors on breast cancer risk in Tunisia: a case–control study. *Med Oncol*, **30**, 480.

Nkondjock A, Ghadirian P (2005). Facteurs de risque du cancer du sein, M/S. *Med Sci (Paris)*, **21**, 175-80.

Parkin DM, Bray F, Ferlay J, Jemal A (2012), Cancer in Africa 2012. *Cancer Epidemiol Biomarkers Prev*, **23**, 953–66.

Plan stratégique de lutte contre le cancer 2013-2017, Mai 2013, Ministère de la santé, Burkina Faso.

Sano DI, Cisse R, Dao B, et al (1998). Le cancer du sein : problèmes diagnostiques et thérapêutiques au CHU de Ouagadougou. *Médecine d'Afrique Noire*, **45**, 297-301.

Tazzite A, Jouhadi H, Saiss K, Benider A, Nadifi S (2013). Relationship between family history of breast cancer and clinicopathological features in Moroccan patients. *Ethiop J Health Sci*, **23**, 2.

Timothy JK, Pia KV, Emily B (2001). Epidemiology of breast cancer. *Lancet Oncol*, **2**, 133-40.

Togo A, Traoré A, Traoré C, et al (2010). Cancer du sein dans deux centres hospitaliers de Bamako (Mali) : aspects diagnostiques et thérapeutiques. *J Afr Cancer*, **2**, 88-91.

Yip CH, Taib NA, Mohamed I (2006). Epidemiology of breast cancer in Malaysia. *Asian Pac J Cancer Prev*, **7**, 369-74.