

Study of Non-Genetic Risk Factors for Breast Cancer in Young Women at the Gynecology-Obstetrics Clinic of CHU Sylvanus Olympio in Lomé, Togo

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How to cite this paper: Ketevi, A.A., Kougnaglo, K.A., Logbo-Akey, K.E., Andele, K.A., Aboubakari, A.S., Bassowa, A., Dougaibe, B., Ajavon, D.R.D., Darre, T. and Akpadza, K. (2025) Study of Non-Genetic Risk Factors for Breast Cancer in Young Women at the Gynecology-Obstetrics Clinic of CHU Sylvanus Olympio in Lomé, Togo. *Open Journal of Obstetrics and Gynecology*, 15, 224-234. <https://doi.org/10.4236/ojog.2025.152019>

Received: December 29, 2024

Accepted: February 21, 2025

Published: February 24, 2025

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Abstract

Introduction: Considering a disease of postmenopausal women, there is a noted trend of increasing breast cancer cases among premenopausal women. Our study aimed to determine the main risk factors for breast cancer in women aged 40 and under. **Materials and Methods:** This was a case-control study with exhaustive sampling of all respondents with histological proof over a 12-month period, matched by age. For all statistical tests, we used a significance threshold of 5%. Additionally provided are the ORs and their 95% confidence intervals, the mean, and standard deviation. **Results:** We collected 65 cases and 130 controls. The frequency of breast cancer in women aged 40 and under was 35.5%. The mean age was 35.6 ± 4.5 years among cases compared to 32.1 ± 7.9 years among controls. A significantly positive association was detected in both univariate and multivariate analysis between age and breast cancer [(OR) = 10.30; 95% CI (1.99 - 53.23)] and [(OR) = 7.53; 95% CI (1.82 - 31.23)]; family history of breast cancer and breast cancer [(OR) = 9.99; 95% CI (1.43 - 69.58)]; smoking and breast cancer [OR = 13.11; 95% CI (1.05 - 163.30)]; sedentary lifestyle and breast cancer [OR = 3.36; 95% CI (1.01 - 11.17)]; and night work and breast cancer [(OR) = 72.05; 95% CI (8.15 - 637.25)]. **Conclusion:** Earlier systematic screening and regular follow-up should be conducted in young women in our context.

Keywords

Cancers, Breast, Risk Factors, Young Women

1. Introduction

Considering a disease of postmenopausal women [1], there is a noted trend of increasing breast cancer cases among premenopausal women [2]. It is the leading cause of disability among young women in low to middle-income countries [2] [3]. The definition of “young woman” varies according to studies and contexts [4]. In young women, this cancer is a particular problem due to the major medical and emotional challenges that this diagnosis entails. In Togo, several studies have been carried out in young women. Darré *et al.* in 2017 [5] reported that young women under 35 accounted for 36.2% of cases. Djiwa *et al.*, in 2022 [6], reported a hospital prevalence of breast cancer of 4.35% in women aged under 40. Another study reported an average age of 38.6 years for women with breast cancer [7]. According to the 2022-2025 cancer plan, breast cancer ranks first in terms of incidence and mortality, with 850 new cases, including 215 in the 15 to 39 age group, and 450 deaths [1] [8]. The heterogeneous phenotype and genotype of premenopausal breast cancer hamper risk assessment, early diagnosis, cost-effective treatment and long-term disease [9]. To this end, triple-negative breast cancer, a subtype with the poorest outcome, is more typical in pre-menopausal women [10]. A survey of women’s knowledge of risk factors and screening methods showed that only 31% of respondents had screened themselves for breast cancer, while 27.7% had performed breast self-examination. In terms of risk factors, personal history of breast cancer was cited as a non-modifiable risk factor by 51.7% of respondents, and smoking as a modifiable risk factor by 58.9%. Only 31% of them had undergone screening [11]. Given the frequency of cases of breast cancer in young women during gynaecological consultations, we proposed to carry out this study, the general objective of which is to determine the main recognised and suspected non-genetic risk factors for breast cancer in young women at the CHU SO.

2. Methods

This was a case-control study (1 case/2 controls) matched by age. Data collection took place from July 1, 2022, to June 30, 2023, and considered a prospective period for both cases and controls at the gynecology and obstetrics clinic of CHU Sylvanus Olympio. Included in our study were all women diagnosed with breast cancer with histological confirmation during the study period who consulted at the gynecological and breast oncology unit and were aged 40 and under. The controls consisted of all women with a breast tumor that was not histologically proven to be carcinoma and who consulted during the study period, also aged 40 and under. As for the cases, after a clinical examination, a radiological examination had to be requested for the BIRADS classification, followed by a pathological examination, after biopsy of the lesion, to certify that it was either an adenofibroma or any other benign tumour. Data were collected using a pre-established and pre-tested survey form. The questionnaire was administered to all included patients after obtaining informed consent, ensuring anonymity and confidentiality. The variables studied included sociodemographic data, history, lifestyle, clinical aspects, and histology.

The data were processed and analyzed using Epidata Version 3.1, SPSS 22.0, and Word 2016. The statistical tests used were: mean, standard deviation, Odds Ratio (OR), 95% Confidence Interval (CI), and the significance threshold with $p < 0.05$.

3. Results

3.1. Frequency

We recorded a total of 183 cases of breast cancer in women, of which 65 cases were in young women aged 40 and under, representing a frequency of 35.5%. These cases were matched with 130 controls.

3.2. Age

The age groups [30 - 34 years] and [35 - 40 years] represented 40.5%, 39.3% for cases and 59.5% and 60.7% for controls. The mean age was 35.6 ± 4.5 years with extremes of 22 and 40 years for cases and 32.1 ± 7.9 years with extremes of 14 and 40 years for controls with an OR = 1.47/95% CI 0.70 - 3.07] for the [30 - 34] age group and an OR = 1.82/95% CI: [0.98 - 3.37] for the [35 - 40] age group. This means that women in these age groups are 1.47 times and 1.82 times more likely to develop breast cancer respectively, and this risk increases with age (Table 1).

Table 1. Distribution of patients according to age.

	Cases (N = 65)	Controls (N = 130)	OR	95% CI
	n (%)	n (%)		
[14 - 25 years]	2 (6.5)	29 (93.5)	0.11	0.02 - 0.47
[25 - 30 years]	6 (30.0)	14 (70.5)	0.84	0.30 - 2.30
[30 - 35 years]	15 (40.5)	22 (59.5)	1.47	0.70 - 3.07
[35 - 40 years]	42 (39.3)	65 (60.7)	1.82	0.98 - 3.37

3.3. Level of Education and Occupation

The secondary level was represented by 38.5% of the cases and 33.8% of the controls. Vendors were represented by 41.5% of the cases and 36.9% of the controls (Table 2).

3.4. Risk Factors

A family history of breast cancer was found in 81.3% of the cases and 18.8% of the controls, with an OR = 10.58/95% CI: [2.89 - 38.68]. This means that women with a family history of breast cancer are 10.58 times more likely to develop breast cancer. Among the cases, 48.1% had their first menstruation at age 12 compared to 51.9% of the controls. The average age at menarche for cases and controls was 12.7 ± 1.8 years and 14.6 ± 2.0 years respectively, with extremes of 10 and 16 years for the cases, and 9 and 20 years for the controls, with an OR = 0.83/95% CI: [0.43 - 1.60]. This means that having a menarche after the age of 13 is a

Table 2. Distribution of patients according to level of education and occupation.

	Cases		Controls	
	Effective	%	Effective	%
Level of Education				
Uneducated	13	20.0	32	24.6
Primary	23	35.4	40	30.8
Secondary	25	38.5	44	33.8
Higher	4	6.1	14	10.7
Occupation				
Housewife	9	37.5	15	62.5
Vendor	27	37.5	45	62.5
Seamstress	9	37.5	15	62.5
Hairdresser	5	45.5	6	54.5
Civil servant	3	16.7	15	83.3
Pupil/Student	1	4.2	23	95.8
Others	11	50.0	11	50.0

Others = photographer, farmer, waitress, student.

protective factor against the development of breast cancer. Personal history of mastopathy accounted for 63.3% of the controls compared to 36.7% of the cases, with an OR = 1.15/95% CI: [0.74 - 3.03]. This means that women with a personal history of mastopathy are 1.15 times more likely to develop breast cancer. Multi-gravida and paucigravida women each represented 61.7% of the controls compared to 38.3% of the cases, with an OR = 1.37/95% CI: [0.72 - 2.59]. This means that multigesture and paucigesture women are 1.37 times more likely to develop breast cancer. Multiparous women represented 61.9% of controls compared with 38.1% of cases, with an OR = 1.30/95% CI: [0.64 - 2.65]. This means that multiparous women have 1.30 times more risk of developing breast cancer. In both groups, 38.2% of the cases and 61.8% of the controls were taking hormonal contraceptives, with an OR = 0.86/95% CI: [0.46 - 1.63]. This means that not using contraceptives is a protective factor against the development of breast cancer. On the other hand, women using hormonal contraceptives had an OR = 1.34/95% CI: [0.70 - 2.58]. This means that the group using hormonal contraception had a 1.34 times greater risk of developing breast cancer (**Table 3**), with a minimum duration of one year. The duration (1 to 5 years) of contraceptive use was 39.6% for the diseased group and 60.4% for the non-diseased group, with an OR = 2.40/95% CI: [0.59 - 9.75]. This means that women who had been using hormonal contraceptives for between 1 and 5 years were 2.40 times more likely to develop breast cancer than women who had been taking them for less than a year. Breastfeeding was practiced in 35.7% of the cases and 64.3% of the controls, with an OR = 1.15/95% CI: [0.781 - 3.879]. This means that despite the fact that women have only breastfed, they have 1.15 times the risk of breast cancer. The average BMI

Table 3. Distribution of patients according to risk factors.

	Cases (N = 65)	Controls (N = 130)	OR	95% IC
	n (%)	n (%)		
Family history of breast cancer				
Yes	13 (81.3)	3 (18.8)	10.58	2.89 - 38.68
No	52 (29.1)	127 (70.9)	0.09	0.02 - 0.34
Age of menarche				
≤11 years	2 (28.6)	5 (71.4)	0.79	0.15 - 4.20
12	13 (48.1)	14 (51.9)	2.07	0.91 - 4.71
13	23 (63.9)	13 (36.1)	4.92	2.29 - 10.60
14	18 (30.5)	41 (69.5)	0.83	0.43 - 1.60
≥15 years	9 (13.6)	57 (86.4)	0.20	0.09 - 0.45
Mastopathy				
Yes	22 (36.7)	48 (63.3)	1.15	0.74 - 3.03
No	43 (31.9)	92 (68.1)	0.66	0.32 - 1.34
Gestation				
Nulligravida	8 (22.2)	28 (77.8)	0.51	0.21 - 1.19
Primigravida	11 (28.2)	28 (71.8)	0.74	0.34 - 1.60
Paucigravida	23 (38.3)	37 (61.7)	1.37	0.72 - 2.59
Multigravida	23 (38.3)	37 (61.7)	1.37	0.72 - 2.59
Parity				
Nulliparous	11 (22.9)	37 (77.1)	0.51	0.24 - 1.08
Primiparous	13 (28.9)	32 (71.1)	0.76	0.37 - 1.58
Pauciparous	28 (41.7)	35 (58.3)	1.69	0.91 - 3.19
Multiparous	16 (38.1)	26 (61.9)	1.30	0.64 - 2.65
Contraception				
No contraceptive	43 (32.3)	90 (67.7)	0.86	0.46 - 1.63
Hormonal	21 (38.2)	34 (61.8)	1.34	0.70 - 2.58
Non-hormonal	1 (1.5)	6 (4.6)	0.32	0.03 - 2.74
Breastfeeding				
Yes	51 (35.7)	92 (64.3)	1.15	0.74 - 3.03
No	14 (26.9)	38 (73.1)	0.66	0.32 - 1.34
Body Mass Index				
<25 kg/m ²	26 (28.3)	66 (71.7)	0.64	0.35 - 1.18
≥25 kg/m ²	39 (37.3)	64 (62.1)	1.54	0.84 - 2.82
Smoking				
Yes	5 (85.7)	1 (14.3)	13.11	1.54 - 111.42
No	59 (31.4)	129 (68.6)	0.07	0.01 - 0.64

Continued**Sedentary lifestyle**

Yes	56 (38.6)	89 (61.4)	2.86	1.29 - 6.34
No	9 (18.0)	41 (82.0)	0.34	0.15 - 0.77

Night work

Yes	26 (96.3)	1 (3.7)	86.0	11.30 - 654.26
No	39 (23.2)	129 (76.8)	0.01	0.002 - 0.08

Circadian rhythm disorder

Yes	5 (100.0)	0 (0.0)	3.16	2.56 - 3.90
No	60 (31.6)	130 (66.7)	0.31	0.25 - 0.38

Alcoholic drink (>1 glass/day)

Yes	35 (46.1)	41 (53.9)	2.53	1.37 - 4.67
No	30 (25.2)	89 (74.8)	0.39	0.21 - 0.72

was $26.4 \text{ kg/m}^2 \pm 4.5$ with extremes of 17 and 35 kg/m^2 for the cases. A BMI $\geq 25 \text{ kg/m}^2$ was found in 37.3% of the cases and 62.1% of the controls, with an OR = 1.54/95% CI: [0.84 - 2.82]. This means that women with a BMI $\geq 25 \text{ kg/m}^2$ were 1.54 times more likely to develop breast cancer. Smoking status was found in 85.7% of the cases compared to 14.3% of the controls, with an OR = 13.11/95% CI: [1.54 - 111.42]. This means that women who have once smoked are 13.11 times more likely to develop breast cancer than non-smokers. Sedentary lifestyle was found in 38.6% of the cases and 61.4% of the controls, with an OR = 2.86/95% CI: [1.29 - 6.34]. This means that women who lead a sedentary lifestyle are 2.86 times more likely to develop breast cancer. Night work was found in 96.3% of the cases and 3.7% of the controls, with an OR = 86/95% CI: [11.30 - 654.26]. This means that women who work at night on a regular basis are 86 times more likely to develop breast cancer. Circadian rhythm disorder was found in 100% of the cases and 0% of the controls, with an OR = 3.16/95% CI: [1.54 - 111.42]. This means that women with a circadian rhythm disorder are 3.16 times more likely to develop breast cancer. Alcohol consumption was found in 46.1% of the cases and 53.9% of the controls, with an OR = 2.53/95% CI: [1.37 - 4.67]. This means that women who drink at least one glass of alcohol a day are 2.53 times more likely to develop breast cancer.

3.5. Multivariate Analysis

In multivariate analysis, age 30 - 34 years and 35 - 40 years ($p < 0.01$, OR = 10.30; [95% CI]: [1.99 - 53.23]), ($p < 0.01$, OR = 7.53; [95% CI]: [1.82 - 31.23]); family history of breast cancer ($p < 0.02$, OR = 9.99; [95% CI]: [1.43 - 69.58]); smoking ($p < 0.05$, OR = 13.11; [95% CI]: [1.05 - 163.30]); sedentary lifestyle ($p < 0.05$, OR = 3.36; [95% CI]: [1.01 - 11.17]), and alcohol consumption ($p < 0.02$, OR = 2.93; [95% CI]: [1.20 - 7.13]) were identified as risk factors with a significant difference (Table 4).

Table 4. Multivariate analysis of risk factors.

Risk factors	OR	95% IC		P
		Lower	Superior	
Age 30 - 34 years	10.30	1.99	53.23	0.01
Age 35 - 40 years	7.53	1.82	31.23	0.01
Family history of breast cancer	9.99	1.43	69.58	0.02
Age at menarche at 12 years	2.36	0.56	9.87	0.24
Age at menarche at 13 years	1.52	0.36	6.38	0.57
Mastopathy	0.44	0.16	1.19	0.10
Hormonal contraceptive	0.77	0.17	3.55	0.73
BMI > 25	0.89	0.35	2.26	0.81
Smoking	13.11	1.05	163.30	0.05
Night work	72.05	8.15	637.25	0.00
Sedentary lifestyle	3.36	1.01	11.17	0.05
Alcohol consumption	2.93	1.20	7.13	0.02
Circadian rhythm disorder	590088682.41	0.0	-	1.00

4. Discussion

The average age was 35.6 ± 4.5 years, with extremes of 22 and 40 years for the cases and 32.1 ± 7.9 years with extremes of 14 and 40 years for the controls. In 2022, Djiwa *et al.* [6] reported an average age of 35.4 ± 3.5 years. Fernandes *et al.* [12] in 2023 reported an average age of 36.1 years for the cases and 62 years for the controls. Age is considered the most significant risk factor. This aligns with literature data, which indicates that the average age of breast cancer onset in young women is often after 30 years [13]. We also found a correlation between age and breast cancer risk; the older one gets, the higher the risk of breast cancer. In addition, the population of developing countries such as Togo is young, which may explain why breast cancer occurs in young women. Additionally, we observed that a family history of breast cancer increases the risk 10.58 times; the frequency was 81.3% in cases compared to 18.8% in controls. Our frequency is higher than that reported by Bergaoui *et al.* [14] with 3.33% of cases, and Laurent *et al.* [15] with 29.86% in cases and 15.97% in controls. This can be explained by the fact that the presence of a family history and the degree of kinship increase the risk of developing breast cancer, and should be tested for BRCA genetic mutations [16]. Unfortunately, these tests are not carried out in our practice because of the technical platform. The average age of menarche among sick women was 12.7 ± 1.8 years, compared to 14.6 ± 2.0 years for controls. Women who had menarche at 12 or 13 years have a higher risk of developing breast cancer (OR = 2.07 and 4.92). Laurent *et al.* [15] reported that menarche before 12 years (OR = 0.46/95% CI: [0.24 - 0.88]) is a risk factor for breast cancer, and this risk increases by 50% if the first menses appeared before the age of 12 according to Nadia *et al.* [17]. A woman

who has had her period very early will be exposed to oestrogen secretion over a long period, increasing the risk of breast cancer [18]. Therefore, women with menarche at 12 or 13 years should be monitored throughout their lives in our context. Pauciparous and multiparous women had a breast cancer-associated risk of 1.30 and 1.69 times higher than nulliparous women. OR = 1.30 and 1.69. This result is similar to that found in a meta-analysis where multiparity was associated with an increased risk of breast cancer, with a 1.60 increase among those under 40 [19]. In the literature, multiparity is found to be a protective factor only in post-menopause and in the absence of a family history of breast cancer [20]. We also found the same for paucigravida and multigravida women who were more affected in our study. Indeed, multigravida and paucigravida women represent 61.7% of the controls compared to 38.3% of the cases OR = 1.37. This means that multigravida and paucigravida women have 1.37 times the risk of developing breast cancer. It remains to be seen whether these pregnancies were carried to term. Hormonal contraception was more used in our study; 38.2% for the cases and 61.8% for the controls, with the risk multiplied by 1.34. Our result is similar to that of Drissi *et al.* [21], who reported that the use of oral contraceptives would be responsible for an increased risk of breast cancer in women in 60% of cases compared to 41.3% of controls (OR = 2.07/95% CI: [1.50 - 2.86]). Similarly, a meta-analysis in Japan showed that the use of oral contraceptives could increase the risk of this cancer during the premenopausal period but not during the post-menopausal period [22]. According to literature data, a pooled analysis of the collaborative study observed a low relative risk of 1.12 with an effect duration > 4 years [23]. Breastfeeding was practiced in 35.7% of the cases and 64.3% of the controls, with the risk multiplied by 1.15. This could be explained by the fact that the LAM (Lactation amenorrhea method) has not been fully respected. The sample size could also explain our result. We reported that the average BMI was 26.4 kg/m². BMI ≥ 25 kg/m² was found in 37.3% of cases and 62.1% of controls, with a risk of 1.54. The breast cancer risk according to obesity or overweight is low at 1.54 times. This is similar to the literature data, which estimates that in the premenopausal period, overweight and obesity tend to decrease the risk of breast cancer compared to the postmenopausal period [24]. Smoking was found in 85.7% of cases compared to 14.3% of controls. OR = 13.11. This result is similar to those of a meta-analysis on the role of induced abortion, alcohol consumption, and smoking as triggers of breast cancer risk in women from developed and less developed countries, demonstrating that smoking women have a higher risk of developing breast cancer depending on the country (OR = 1.46; 95% CI: 1.08 - 1.97) [25]. This risk is also correlated with the period of tobacco consumption, especially around menarche, the longer duration, and the type of smoking (active and passive). Sedentary lifestyle was found in 38.6% of the cases and 61.4% of the controls, with a risk = 2.86 in univariate analysis and OR = 2.86/95% CI: [1.29 - 6.34] in multivariate analysis compared to those who practiced normal physical activity, is a risk factor for breast cancer in our context. This is similar to what the literature reports [25]. Circadian rhythm disorder was found in 100% of cases and 0% of

controls. OR = 3.16/95% CI: [1.54 - 111.42]. Night work was found in 96.3% of cases and 3.7% of controls. OR = 86/95% CI: [11.30 - 654.26]. Our result is similar to that of Nadia *et al.* [17], who reported that a moderate increase in breast cancer risk is associated with night work, especially for women who work more than 20 years. The recommendations are for regular breast monitoring for this professional population throughout their lives [26] [27].

5. Conclusion

Our study on the investigation of non-genetic risk factors for breast cancer in young women aged 40 and under at CHU SO was conducted over a 12-month period. The following risk factors were identified with significant differences: age 30 - 34 years and 35 - 40 years, family history of breast cancer, smoking, sedentary lifestyle or physical inactivity, alcohol consumption, and night work. Breast cancer occurring in young women under the age of 40 is generally rare, but today there is a change in this situation. This type has its own unique epidemiological, diagnostic, and prognostic characteristics. Earlier systematic screening and regular follow-up should be conducted for young women in our context. A particular focus should be placed on raising awareness to encourage the population to see a doctor as soon as possible when unusual signs appear. Advocacy should be made to the authorities for the establishment of an organized breast cancer screening program in our country.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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