Research Aticle

Nutrition and Breast Cancer in the Provincial Hospital Jason Sendwe, in Lubumbashi: A Case Control Study, January 2019 to December 2020

Ngoy Bulaya Emmanuel[1-3]*, Epule Difumakoy Nelly[1], Mbayo Muganza Gerard[2], Kalume Tshinuishi Credo[1], Kela Nsenga Catherine[1], Tshibuabua Mutombo Bavon[1], Kabongo Ntambwe John[3], Mapatano Mala Ali[3] and Luboya Numbi Oscar[1,2]

[1]Nutrition Research Unit, Lubumbashi School of Public Health, University of Lubumbashi, Democratic Republic of the Congo

[2]Department of Nutrition, High Institute of Medical Techniques, ISTM, of Lubumbashi, Democratic Republic of the Congo

[3]Department of Nutrition, School of Public Health, Faculty of Medicine, University of Kinshasa, Democratic Republic of the Congo

*Corresponding Author: Ngoy Bulaya Emmanuel, Nutrition Research Unit, Lubumbashi School of Public Health, University of Lubumbashi, Democratic Republic of the Congo.

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Abstract

Background and objective

The morbidity and mortality of breast cancer is a major public health problem in the Democratic Republic of the Congo (DRC). However there is insufficient study in the country highlighting its epidemiological profile. This study aims at assessing at what extent dietary habits are associated with breast cancer. The objectives of this study are to identify the dietary habits of women with breast cancer, to determine the nutritional status of patients, to determine the frequency and specific mortality due to breast cancer and finally to identify whether or not there is an association between dietary intake and breast cancer.

Designs (Methodology)

We conducted a case control study of 430 hospitalized patients at the Provincial Hospital Jason Sendwe from January 2019 to December 2020. The study population consisted of women with breast cancer (cases) and without breast cancer (controls). Encoding data and data analysis were performed using Excel, IBM SPSS 23, and Openepi software to assess association.

Results

The frequency of breast cancer was 124 cases or 28.84%, the frequency of appropriate nutrition dietary habits against breast cancer was 13.96% and that of inappropriate nutrition dietary habits was 86.04%. Regarding nutritional status, 8.87% of patients were underweight, 18.54% overweight and 13.70% obese. We found a significant association between dietary intake and breast cancer risk (Odds Ratio: 2.65; 95% CI (1.49-4.71); p-value: 0.001). Our study reports a specific mortality due to breast cancer of 34.67%.

Conclusion

Breast cancer is a very frequent and fatal disease in our environment, which unfortunately is often discovered late due to lack of screening and good nutritional management. The respect of the food pyramid (appropriate diet) and a Mediterranean diet are the cornerstone in the prevention not only of breast cancer but also of other cancers and pathologies.

Keywords: Breast Cancer; Nutrition; Sendwe Hospital; Lubumbashi; DRC

Nutrition and Breast Cancer in the Provincial Hospital Jason Sendwe, in Lubumbashi: A Case Control Study, January 2019 to December 2020

37

Introduction

Background

Breast cancer is the leading cancer in women in terms of incidence and mortality worldwide. Despite therapeutic progress, it still remains a serious cancer with heavy physical and psychological after-effects [1]. Thus, as the causes of breast cancer are not known, several studies have highlighted a number of factors involved in the occurrence of breast cancer. These factors include: a diet rich in fat and carbohydrates, increased consumption of red meat and cold cuts, alcoholism, smoking, lack of breastfeeding, and food contaminants such as heterocyclic amines, polycyclic aromatic hydrocarbons and pesticides [2]. High consumption of flavonoids (red fruits, apples, onions, spinach) reduces the proliferation of cancer cells. Preventing breast cancer through nutrition consists of balancing one's overall consumption, favouring what protects and reducing what may contribute to the development of breast cancer [3]. Globally, the number of breast cancers has increased significantly over the past 30 years. Incidence is increasing in all regions of the world, including developing countries. A study based on more than 300 cancer registries in 187 countries showed that the number of breast cancers had increased from about 640,000 cases in 1980 to 1.6 million in 2010, an increase of almost 250% [4]. The incidence of breast cancer has increased by 3.1% per year in all regions of the world. However, the increase in deaths has been slower (1.8% per year) than the increase in cases, from 250,000 in 1980 to 425,000 in 2010, including 68,000 women aged 15-49 in developing countries. With approximately 6,000 new cases and 2,500 deaths each year in Belgium, breast cancer is the leading cause of cancer morbidity and mortality in women [5]. In France, the number of new cases of breast cancer was estimated in 2012 at 48,763 cases (incidence rate standardised to the world population = 88.0 per 100,000 women). Switzerland is thus among the countries with the highest incidence of breast cancer in the world, with a European standardised rate of 108 cases per 100,000 women per year. The incidence of breast cancer represents 32% of female cancers with approximately 5300 new cases each year [6]. About 2.09 million cases of breast cancer were diagnosed in 2018 [7] and 2.26 million in 2020 [8]. Of the 1.6 million cases worldwide in 2010, half occurred in developing countries [4]. In Morocco, in 2014, the frequency of breast cancer was 267 cases [1]. In Algeria, breast cancer is the most common cancer with 6625 new cases diagnosed in 2012 [9].

Breast cancer remains the most frequent and deadly cancer in women. In 2008 the mortality rate by breast cancer reached 458,503 deaths or 13.7% while in 2012 this same rate reached 521907 cases or 14.7% of the overall cancer mortality in women which puts it in the first position from the mortality point of view. In Morocco, breast cancer mortality has increased from 14.2% or 2804 deaths in 2008, to 27.8% of overall cancer mortality, or 2878 deaths in 2012 [10]. In 2015, breast cancer was responsible for 57,000 deaths worldwide [11] and 685,000 deaths in 2020 [8]. With 1,200 deaths per year, breast cancer is the second most common cancer and the third most common cause of cancer mortality in France [12]. Diet is among the main several causes of cancer [2,3].

In the Democratic Republic of Congo (DRC) the incidence of breast cancer was estimated at 50,000 cases in 2008 [13]. This incidence increased from 4578 cases in 2014, in Kinshasa the incidence of breast cancer was 24% [14]. Breast cancer, by virtue of its morbidity (2,704 deaths, i.e. 16.0% of the total number of deaths due to cancer (6,900 deaths)) and its mortality, constitutes a major public health problem [15]; this mortality is always high because of the late diagnosis and the significant lack of therapeutic means [13]. In this country, especially in the city of Lubumbashi, there was insufficient statistics on the epidemiology of breast cancer [16]. Diet factors associated with the breast cancer are unknown in DR Congo, particularly in Haut Katanga Province. There was therefore needed to update data on breast cancer morbidity and mortality in the Lubumbashi city.

Research question

Could inappropriate diet consumption play a role in the risk morbidity of breast cancer of hospitalized patients in the Provincial General Hospital Jason Sendwe?

Hypothesis

Null hypothesis: inappropriate diet consumption is not associated with the breast cancer of hospitalized patients.

Alternative hypothesis: inappropriate diet consumption is associated with the breast cancer of hospitalized patients.

Objective

The present study aimed to highliht nutrition dietary habits associted with the breast cancer of hospitalized patients in the Provincial General Hospital Jason Sendwe from January 2019 to December 2020.

Specific Objectives were: to identify the hospitalized breast cancer patients and the control, to asess inappropriate diet consumption habits of hospitalized breast cancer patients, to evaluate the relationship between breast cancer and inappropriate diet consumption habits of hospitalized patients and to determine the specific mortality due to breast cancer.

Nutrition and Breast Cancer in the Provincial Hospital Jason Sendwe, in Lubumbashi: A Case Control Study, January 2019 to December 2020

38

Design and Methods

Study setting

This work took place in the provincial general reference hospital Jason Sendwe Lubumbashi city, Haut Katanga Province, DR Congo.

Geographical location and background of the setting

Jason SENDWE Hospital is located in the Lubumbashi Health Zone and is bounded to the North by SENDWE street; to the South by des écoles street; to the East by the Lycée Wema; and to the West by Likasi street.

Formerly known as the Prince Leopold Hospital, the Jason SENDWE Provincial General Reference Hospital, which served as the framework for the present study, was built in 1928. The motives that prompted the authorities of the time to build this hospital for the indigent were both social and humanitarian, i.e. the fight against endemic diseases due to the demographic growth in order to avoid contagion in the Queen Elizabeth Hospital (White Hospital). This hospital, whose construction was not an easy task, was built in two phases, namely: the pavilion part and the multi-storey part in which several hospital services are located. The first phase of construction was devoted to the residential part and was completed in 1928. However, a wing was built before our country gained independence, but the work was interrupted following the unfortunate events that followed the country's independence. It is a state hospital, managed until 1962 by the state itself. In 1962, following the installation of the refugee camp of sad memory between the Ruashi (where the University Hospital of the Official University of Congo was located) and the university campus, the University authorities were unable to carry out the training of medical students and were thus obliged to move to the SENDWE Hospital. From that time onwards, there was a two-headed management with a state management alongside the University management. In the same year, the multi-storey building was inaugurated. From 1974, the management of the hospital was entrusted to Gécamines for social reasons, the most important of which was the concern of the President of the Republic at the time to allow the population to benefit from good quality care at a lower price. Two years later, the University moved into the former Queen Elizabeth Clinic, now the Cliniques Universitaires de Lubumbashi [17].

Population and Sampling

The study population is composed of women with cancer hospitalised at Sendwe Hospital. The sample was exhaustive and consisted of 430 subjects, 124 cases and 306 controls. We consulted all the patients' files or records.

Inclusion criteria

Woman patient affected by breast cancer or other cancer and hospitalised at Sendwe Hospital from January 2019 to December 2020, has consulted the hospital's nutrition services and medical informations are available.

Exclusion criteria

Pregnant women, breastfeeding women or women on special diets were excluded from the study, as during this period they have eating habits that do not reflect their true dietary habits.

People (cases and controls) with chronic diseases were also excluded from the study, as certain chronic diseases such as hypertension and type 2 diabetes are thought to be related to the risk of developing breast cancer.

Materials

Among the materials sources of data, we consulted cards, patients foods diaries, and cancer registry.

Study design

We conducted a case-control study. Women with breast cancer were cases and those with other types of cancers (uterine, cervical, liver,...) were controls. Among cases (124) and controls (306), we checked who consumed inappropriate or appropriate nutrition dietary habits.

Data collection technique

We used the hospital data tools such as register to take out clinical data in accordance with the litterature review related to data collection.

Variables examined

Socio-demographic variables of subject study: Age of patient, marital status of the patient (married, single, widowed, divorced), occupation (civil servant, liberal, housewife), residence (Lubumbashi, Katuba, Kenya, Kamalondo, Ruashi, Annexe, Kampemba)

Exposure variable: nutrition diet habits

- Inappropriate diet habits consumption (red meat, total fat, milk and milk products, tabaco smoking, alcohol, sugar and sweeten products, delicatessen, ...)

- Approriate diet habits consumption (fruits and vegetables, fish, poultry, ...)

Outcome variable: breast cancer

Nutrition and Breast Cancer in the Provincial Hospital Jason Sendwe, in Lubumbashi: A Case Control Study, January 2019 to December 2020

39

Data analysis

Descriptive statistics of the sample and univariate analysis between exposure and outcome variables were undertaken using IBM SPSS 23 Statistics and Openepi with Twobytwo table to assess association of breast cancer with nutrition diet habits.

Potential biases

Type I and type II errors were minimized in calculating sample size using P-S Power and Sample Size Calculation Software, IBM SPSS version 23, 95% of confidence interval with desired precision of 5%. Bias of skewed selection, biases of skewed information and misclassification (differential and no differential) were mitigated by inclusion and exclusion criteria fixed, limiting collection clinical data to the nutritionist office in the Jason Sendwe hospital, matching one case to at least two controls and by defining the exposure and outcome variables.

Ethical consideration

Our study protocol was approved by the committee of medical ethic of the University of Lubumbashi (UNILU) in order to guarantee respect of person, benevolence and honest distribution's risk, and benefit of study. The health provincial authorities of Jason Sendwe Hospital permitted also present study.

Results

The table 1 shows that the cancer affected more women over 50 years of age (43.3%) and the average age was 45 years. More than half of the women with cancer were housewives (70.2%) compared to 13.5% of women who were civil servants. The cancers affected more married women (60.5%) compared to 2.1% of women with cancers. Kampemba is the commune where the majority of women with cancer resided (37.4%) compared to 2.6% of patients who resided in the commune of Kenya table 2 shows that the prevalence was 28.2% for breast cancer, 86% for inappropriate eating habits, 20.7% for obesity, 27.4% for overweight, 13.5% for underweight and 34.7% of patients who died of breast cancer.

In table 3, for the 430 cancer patients hospitalised at the jason sendwe hospital from January 2019 to December 2020, dietary habits included red meat (50.7% of patients), cold cuts (48.8% of

Variable	n = 430	Percentage (%)
Bracket age (years)		
Average age (years)	45	
≤ 20	29	6.7
21-30	61	14.2
31-40	96	22.3
41-50	58	13.5
> 50	186	43.3
Profession		
Civil servant	58	13.5
Liberal work	70	16.3
Housewife	302	70.2
Marital status		
Single	131	30.5
Divorced	9	2.0
Maried	260	60.5
Widow	30	7.0
Residence (township of patient)		
Annexe	81	18.8
Kamalondo	36	8.4
Kampemba	161	37.4
Katuba	13	3.1
Kenya	11	2.6
Lubumbashi	72	16.7
Ruashi	56	13.0

Table 1: Sociodemographic characteristics of haspitalized patients of cancer in the Jason Sendwe Hospital, from 2019 to 2020.

Nutrition and Breast Cancer in the Provincial Hospital Jason Sendwe, in Lubumbashi: A Case Control Study, January 2019 to December 2020

40

Variable	n = 430	Per centage (%)
Cancer type		
Breast cancer	124	28.8
Other cancer	306	71.2
Dietary habits consumption		
Inappropriate dietary habits of patients	370	86.0
Approriate dietary habits of patients	60	14.0
Nutritional status of mother		
Obesity (BMI ≥ 30)	89	20.7
Overweight (BMI 25 - 29.9)	118	27.4
Normal (BMI 18.5-24.9)	165	38.4
Underweight (BMI ≤ 18.5)	58	13.5
Specific mortality due to B. Cancer		
Dead of breast cancer	149	34.7
Survival	281	65.3

Table 2: Prevalence of the breast cancer and inappropriate diet habits consumption and nutritional status of the hospitalized patients of cancer in the Jason Sendwe Hospital, from 2019 to 2020.

patients), sugar and sweets (81.2% of patients), alcoholic beverages (13.5% of patients), tobacco (8. 1% of patients), total fats (71.9% of patients), milk and dairy products (62.6% of patients), fruit and vegetables (96.3% of patients), fish (85.6% of patients) and poultry meat (80.9% of patients).

The results presented in Table 4 show a statistically significant association between inappropriate dietary habits and breast cancer (Chi-square = 20.39, p = 0.0000), except for smoking (Chi-square = 2.186, p = 0.1393). Inpatients with inappropriate dietary habits were 3.4 times more likely to develop breast cancer than those with appropriate dietary habits (OR = 3.453: 1.974 - 6.041). The table then illustrates that inappropriate habits of consuming red meat (Chi-squared = 6.676; p = 0.0097; OR = 1.745: 1.141-2.667), cold cuts (Chi-squared = 4.043; p = 0.0443; OR = 1.535: 1.009-2.345), total fat (Chi-squared = 6.65; p = 0.0099; OR = 1.931: 1.173-3.253), alcoholic beverages (Chi-squared = 6.649; p = 0.0099; OR = 2.085: 1.171-3.686), milk and dairy products (Chi-squared = 11.52; p = 0.0006; OR = 2.212: 1.396-3.559), sugars and sweets (Chi-squared = 4.113; p = 0.0420; OR = 2.898: 1.062-9.887) were statistically associated with breast cancer. But the appropriate dietary habits of consuming poultry meat (Chi-squared = 2.964; p = 0.0851; OR = 0.6422: 0.387-1.076), fish (Chi-squared = 2.186; p = 0.1293;

Variable	n = 430	Per centage (%)
Red meat consumption habit		
Yes	218	50.7
No	212	49.3
Delicatessen		
Yes	210	48.8
No	220	51.2
Sugars and sweet products		
Yes	349	81.2
No	81	18.8
Alcoholic beverages		
Yes	58	13.5
No	372	86.5
Tobacco		
Yes	35	8.1
No	395	91.9
Tot al fats		
Yes	309	71.9
No	121	28.1
Fruits and vegetables		
Yes	414	96.3
No	16	3.7
Milk and dairy products		
Yes	269	62.6
No	161	37.4
Fish		
Yes	368	85.6
No	62	14.4
Poultry		
Yes	348	80.9
No	82	19.1

Table 3: Diet consumption habits of various foods by the hospitalized patients of cancer in the Jason Sendwe Hospital, from 2019 to 2020.

OR = 1.626: 0.862-3.223), fruits and vegetables (Chi-squared = 0.047; p = 0.8281; OR = 0.887: 0.306-2.889) were not statistically associated to breast cancer.

Discussion of Results

Socio-demographic characteristics of women with cancer hospitalised at the Sendwe RGH from January 2019 to December 2020

The average age of our respondents was 45 years. This average age is slightly lower than that of Mbala Kindu in Kinshasa (48 years)

Nutrition and Breast Cancer in the Provincial Hospital Jason Sendwe, in Lubumbashi: A Case Control Study, January 2019 to December 2020

41

Variable	Breast cancer		Chi-Square	p-value	OR	95% CI (OR)	
	Yes	No				Lower	Upper
Diet habit consomption							
Inappropriate	92	278	20.39	0.0000	3.453	1.974	6.041
Appropriate	32	28			1.0		
Red meat consumption							
Yes	75	143	6.676	0.0097	1.745	1.141	2.667
No	49	163			1.0		
Cold cuts consumption							
Yes	70	140	4.043	0.0443	1.535	1.009	2.345
No	54	166			1.0		
Poultry consumption							
Yes	94	254	2.964	0.0851	0.6422	0.387	1.076
No	30	52			1.0		
Sugar et sweet product							
Yes	120	279	4.133	0.0420	2.898	1.062	9.887
No	4	27			1.0		
Alcoholic beverage consumption							
Yes	25	33	6.649	0.0099	2.085	1.171	3.686
No	99	273			1.0		
Total fat consumption							
Yes	100	209	6.65	0.0099	1.931	1.173	3.253
No	24	97			1.0		
Tabaco smoking							
Yes	10	25	0.001312	0.9711	0.986	0.4397	2.09
No	114	281			1.0		
Fish consumption							
Yes	111	257	2.186	0.1393	1.626	0.8623	3.223
No	13	49			1.0		
Milk and dairy product							
Yes	93	176	11.52	0.0006	2.212	1.396	3.559
No	31	130			1.0		
Fruits and vegetables							
Yes	119	295	0.04714	0.8281	0.8877	0.306	2.889
No	5	11			1.0		

Table 4: Association of breast cancer with inappropriate diet habits consumption of hospilized patients of cancer in the Jason Sendwe Hospital, from 2019 to 2020.

[14] and much lower than that reported by Vishnee Bissonauth, (51 years) [18]. On the other hand, it is much higher than that reported in Morocco by Ms JABA Siham (average age 28 years). The bracket age of 50 years and over was the most affected with a rate of 43.3% in our study. The 36 to 40 bracket age was the most affected with a rate of 60%) [1] This difference in results with other authors can be justified by the study population and sample size of each author. Mbala Kindu's sample size was 1791 cases of cancer, while Ms Jaba Siham's study was conducted on young women. The majority of patients were housewives (70.2%). This result is lower than that

Nutrition and Breast Cancer in the Provincial Hospital Jason Sendwe, in Lubumbashi: A Case Control Study, January 2019 to December 2020

42

of Mbala Kindu (76.7%) [14] and much lower than that noted by Bissam who found a frequency of 90% [19]. This lower result could be explained by the lower rate of married women (60.5%) in our sample. This frequency of married is lower than that of Mbala Kindu who observed a frequency of 63.9% of married cases [14], and much lower than that observed in Mali (81.6%) by Diakite., *et al*. In 2011. We believe that the lower frequency of married patients benefiting hospital services in our study is due to the fact that their husbands are unemployed in the study country.

Prevalence of the breast cancer, inappropriate dietary habits consumption, and nutritional status of the hospitalized patients of cancer in the Jason Sendwe Hospital, from January 2019 to December 2020.

Out of a total of 430 women with cancer hospitalised at Jason Sendwe Provincial Hospital from January 2019 to December 2020, 13.5% of them were underweight, 27.4% were overweight and 20.7% were obese. Overweight was lower but underweight and obesity were higher in our study than the findings of Miss JABA Siham in 2016 within overweight was 40%, obesity was 17% and underweight was 7% [1]. The study results may be validated by the sample size which was 430 patients with cancer while Miss JABA Siham assessed the nutritional status of only 12 patients. The frequency of appropriate diet is 14.0% and that of inappropriate diet is 86.0%. Healthy food helps to prevent the occurrence of certain cancers including breast cancer. On the contrary, excessive consumption of certain foods such as meat, cold cuts, milk and dairy products, tobacco, alcohol and fatty fish can favour the development of the disease [20]. The frequency of breast cancer was 28.8%. This frequency is lower than that reported in Morocco [1] and higher than that found in 3 medical facilities of Kinshasa which is 24% [14]. Breast cancer is the most common cancer in women worldwide. About 2.09 million cases of breast cancer were diagnosed in 2018 [7] and 2.26 million in 2020 [8]. The specific mortality rate for breast cancer was 34.7% in our study. In 2008 the mortality rate from breast cancer reached 13.7% [21]. In the Democratic Republic of Congo (DRC), our country, breast cancer by its morbidity (16.0%) and its mortality constitutes a major public health problem [15], and this mortality was still high because of the late diagnosis and the significant deficit of therapeutic means and inappropriate nutrition [13]. So, breast cancer rate is increasing in the country accordingly to our study findings.

Although the estimated number of deaths from breast cancer is less than one-third of the estimated new cases, breast cancer is the most common cause of cancer death among women in less developed countries and the second most common cause of cancer death among women in developed countries.). In 2015, breast cancer was responsible for 571000 deaths worldwide [11] and 685,000 deaths in 2020 [8].

Statistical association between Dietary habits consumption of women and breast cancer risk

There is a significant association between breast cancer risk and inappropriate dietary habits consumption in our findings, particularly red meat, cold cuts, alcoholic beverage, total fat, sugar and sweeten products, milk and dairy products. Fruits and vegetables, fish, poultry and tobacco habit consumption were not significantly associated with the breast cancer risk in our study. In Morocco, the association between breast cancer risk and the main components of the human diet including fruits and vegetables, milk and dairy products, meat, fish, fibre, alcohol, tobacco, deli meats has been the subject of numerous studies. Diet has long been suspected of affecting breast cancer risk and specific food groups and dietary nutrients have been studied in a number of studies. The red meat consumption rate in our study is lower than that of 97% reported in Morocco. Our results about Sugars and sweetened products habits consumption are slightly higher than those of 90% observed in Morocco in a study on diet and breast cancer [21]. This result is justified by the fact that the dietary intake is composed of 68% of carbohydrates. Although it is the main source of energy for the body, excessive consumption of any type of carbohydrate increases the risk of breast cancer. The vast majority of studies have shown that a high consumption of meat and deli meats is associated with an increased risk of various cancers including breast cancer. This risk occurs statistically for a consumption of more than 80g of "red" meat (beef, lamb, pork in the studies) or more than 50g of cold cuts [22]. High consumption of certain foods such as dairy products, oils, eggs, margarine, mayonnaise may reflect a high intake of fats, especially saturated fats. Heavy alcohol consumption increases the risk of breast cancer; this risk increases by about 7% for an average consumption of one alcoholic drink per day [23-24]. An increased risk of breast cancer with an intake of more than 196 g of beef and pork per week wass too carried out (OR: 1.9; 95% CI: 1.1-3.3) [25]. The vast majority of studies have shown that a high consumption of red meat and sausages is associated with an increased risk of various cancers, including breast cancer; this same result was also observed in our study. This risk occurs statistically for a consumption of more than 80g of "red" meat (beef, lamb, pork in the studies) or more than 50g of cold cuts [22].

The relationship between total fat consumption and breast cancer found in our study is often linked to the effect of fat on

Nutrition and Breast Cancer in the Provincial Hospital Jason Sendwe, in Lubumbashi: A Case Control Study, January 2019 to December 2020

43

weight because overweight and obesity represent over than 4 out of 10 patients women. Indeed, a diet rich in fatty acids is associated with weight gain and an increased risk of breast cancer, especially in the post-menopausal period [26].

Our results are in line with those of several epidemiological studies reporting an increased relative risk (RR) of breast cancer in women who drink alcohol, both before and after menopause [5,18,26,27].

The evidence on the association between smoking and breast cancer risk is contradictory. According to a literature review by Nkondjock and Ghadirian [28], some studies report an increased risk, others no risk, while a few report a protective effect of tobacco. In our study tobacco was not effect on breast cancer risk [29] reported that among carriers of mutations in the BRCA1 or BRCA2 genes, there is a 54% reduced risk among those who smoke at least two cigarettes per week, compared to women with mutations who have never smoked. A meta-analysis of studies conducted between 1984 and 2001 found that smoking is a weak risk factor before menopause (RR: 1.21; 95% CI: 1.08-1.36). In women who start smoking at a young age, the RR is 1.14 (95% CI: 1.06-1.23) [30]. In contrast, another study reported no association between smoking and breast cancer in French Canadian women with BRCA mutations [31-32]. In contrast to the study by Rodam., *et al.* (2007), the opposite results to ours (an increased risk of breast cancer with 10 or more cigarettes per day in pre-menopausal (OR: 2.55; 95% CI: 1.81-3.60) and post-menopausal women (OR: 1.78; 95% CI: 1.33-2.37) was found [33-34].

We found a positive and significant association between milk and dairy consumption and breast cancer risk. This observation is similar to that of Djamil maliou [7] and the National Highways Sector Schemes (NHSS) study (milk consumption was associated with an increased risk with an RR of 2.91 (95% CI: 1.38-6.14) comparing the highest category of consumption with the lowest, but the results are slightly statistically insignificant (p = 0.08. Almost 28 prospective and one retrospective cohort study examined the association between dairy products and the risk of developing breast cancer. Of these studies, 17 measured the association between disease and total dairy consumption. Eleven of them found no significant association [18].

The scientific evidence on poultry and breast cancer risk was not sufficiently consistent and therefore there are no specific recommendations on this subject. Poultry consumption is nevertheless preferable to red meat consumption, especially as this type of meat is more accessible to the population [21]. Fish habit consumption was not associated with breast cancer risk in

this study. This findings are similar with those published by WHO according to which increased consumption of fish and Omega 3 fatty acids would have a preventive effect on the development of breast cancer. Animal studies have concluded that the main unsaturated fatty acid Omega 3 has an inhibitory effect on the development of breast cancer [35]. Several studies have investigated different diets for their effects on breast cancer risk, and the Mediterranean diet has been one of the most studied models. The Mediterranean diet encompasses all the beneficial nutritional characteristics presented in nutritional studies and therefore may offer protection against breast cancer [21].

In this study, we found non association between fruit and vegetable consumption and breast cancer risk. This is similar with other studies [36,37]. Our results are in contrast to those of study in New York State [38].

Validity of the Results

This inconsistency of results between our findings and other authors is due to the existence of different measures of association, sample size, study location and time period. Some authors have interpreted the Odds Ratio, relative risk, p-value and other statistical tests and dispersion parameters. Most studies on diet and breast cancer have been conducted in industrialised countries, mainly in North America, Europe and Japan. Although there is variability in dietary patterns in Europe between northern and southern countries, the differences in dietary habits between industrialised and developing countries are even greater. The role of diet in breast cancer risk in developing countries has been less studied. Although the variation in dietary patterns studied across different countries should exceed measurement error, these dietary studies may need to take this factor into account when examining their association with cancer.

Conclusion

The results of this study support the hypothesis that nutrition dietary intake plays an important role in the ethology of breast cancer in women as we found a positive association between nutrition dietary intake and breast cancer risk. The results of our study show that poor dietary habits (inappropriate food consumption) are associated with high breast cancer risk, such as excessive consumption of meat, sausages, milk and dairy products, total fats, sugars and sweet products, red meat, cold cuts, and alcoholic beverage. To reduce this risk, respecting the food pyramid and the Mediterranean diet are the cornerstones in the prevention not only of breast cancer but also of other cancers and pathologies. The results also allow us to observe that the frequency and specific mortality due to breast cancer remains high in the city of

Nutrition and Breast Cancer in the Provincial Hospital Jason Sendwe, in Lubumbashi: A Case Control Study, January 2019 to December 2020

44

Lubumbashi and most patients were subjected to an inappropriate diet (86.0%). The prevention of breast cancer through nutrition consists of balancing one's overall consumption, favouring what protects and reducing what can contribute to the development of breast cancer [3].

Conflict of Interest

Authors declare no conflict of interest exist to publish present paper.

Bibliography

1. Miss JABA Siham. "Cancer du sein chez la femme jeune: Facteurs de risque et prévention (A propos de 23 cas)". Thèse. Université Mohammed V-Rabat Faculté De Médecine Et De Pharmacie -RABAT (2016).

2. Ministère de la communauté française. "Opportunité de dépistage du cancer de seins chez les femmes de 40 à 49 ans". Centre de Recherche Opérationnelle en santé Publique. IPH/EPI Reports Nr (2005): 001.

3. Institut national de cancer (INCA). "Nutrition et cancers". SIREN/187512177. Paris Juin. Inca.fr/nacre (2015).

4. Forouzanfar MH., *et al*. "Breast and cervical cancer in 187 countries between 1980 and 2010: a systematic analysis". *Lancet* (2015).

5. Marina Puddu and Jean Tafforeau. "Opportunité de dépistage du cancer du sein chez les femmes de 40 à 49 ans. Centre de Recherche Opérationnelle en Santé Publique". IPH/EPI Reports Nr.- 001. (2005).

6. Ministère de la santé Suisse. "Moyenne annuelle 2003-2007". estimée à partir des données des registres suisses du cancer (2007).

7. DJAMIL Maliou. "Étude de l'association entre consommation de produits laitiers et risque de développer un cancer du sein: une étude cas-témoins sur des femmes algériennes. ECOLE NATIONALE SUPERIEURE AGRONOMIQUE D'EL HARRACH-ALGER". *Departement De Technologie Alimentaire. Republique Algerienne Democratique Et Populaire* (2019).

8. OMS-AIEA. "Matériels de radiothérapie dans le cadre de la lutte contre les cancers". *Genève* (2021).

9. Terki N., *et al*. "Incidence annuelle du cancer du sein dans la population Algérienne diagnostiquée au niveau des centres de référence d'anatomopathologie en Algérie". Le fascicule de la santé n°19- Avril (2015).

10. LAZREQ F. "Alimentation et cancer du sein". Faculté de Médecine et de pharmacie Université MOHAMMED V. RABAT (2019).

11. AUBRY P and GAUZERE BA. "Les cancers dans les pays en développement. Université de Bordeaux (France)". *Médecine Tropicale* (2019).

12. Institut de veille sanitaire (INVS) . "Réseau français des registres de cancer, Institut national de la santé et de la recherche médicale, Centre d'épidémiologie sur les causes médicales de décès, Hospices civils de Lyon, Institut national du cancer. Estimation nationale de l'incidence et de la mortalité par cancer en France entre 1980 et 2012. Étude à partir des registres des cancers du réseau Francim. Partie 1: tumeurs solides". Saint-Maurice: InVS (2013).

13. RDC-Ministère de la santé publique. "Stratégie nationale de lutte contre les cancers du col utérin et du sein en république démocratique du Congo". *Kinshasa* (2015).

14. Mbala Kingu., *et al*. "Profil épidemio-clinique et moléculaire du cancer du sein dans les hôpitaux de la ville Kinshasa". *KisMed* 9.1 (2019): 326-332.

15. OMS. "Profil des pays pour le cancer". *Genève* (2014).

16. Léon Kabamba., et al. "Pleurésie massive après chirurgie du cancer de sein et arrêt précoce du Tamoxifène: à propos d''une observation". *PanAfrican Medica Journal* (2014).

17. Kimpinde C. "Frequence et cout de la césarienne à l'hopital général provincial de référence Jason Sendwe en 2019". Inedit, UNILU/Ecole de santé publique (2020).

18. Vishnee Bissonauth and Mode de vie. "habitudes alimentaires et cancer du sein: Étude cas-témoins chez les Canadiennes-françaises non porteuses de mutations des gènes BRCA. Thèse présentée à la faculté des études supérieures en vue de l'obtention du grade de Ph.D. en nutrition. Université de Montréal". *Département de Nutrition. Faculté de Médecine* (2008).

19. Kruger R., *et al*. "The determinants of overweight and obesity among 10- to 15-year-old schoolchildren in the North West Province, South Africa-The THUSA BANA (Transition and Health during Urbanisation of South Africans; BANA, children) study". *Public Health Nutrition* 9.3 (2006): 351-358.

20. Karine Giraudon and Alimentation et cancers. "Guide pour se nourrir". LVC, édition (2015).

Nutrition and Breast Cancer in the Provincial Hospital Jason Sendwe, in Lubumbashi: A Case Control Study, January 2019 to December 2020

45

21. Fakhita L. "Systematic Review of Breast Cancer Biology in Developing Countries (Part 1): Africa, the Middle East, Eastern Europe, Mexico, the Caribbean and South America". Scientific Figure on ResearchGate (2017).

22. Jean-Michel Lecerf. "Jean-Louis Schlienger". *Nutrition Préventive Et Thérapeutique* (2016).

23. Hamajima., et al. "Alcohol, tobacco and breast cancer collaborative reanalysis of individual data from 53 epidemiological studies, including 58,515 women with breast cancer and 95, 067 women without disease". *Breast Journal of Cancer* 87 (2002): 1195-1196

24. Taylor EF., *et al.* "Meat consumption and risk of breast cancer in the UK Women's Cohort Study". *British Journal of Cancer* 96 (2007): 1139-1146.

25. Lee MM., *et al.* "Breast cancer and dietary factors in Taiwanese women". *Cancer Causes Control* 16 (2005): 929-937.

26. Ellison RC., *et al.* "Exploring the relation of alcohol consumption to risk of breast cancer". *American Journal of Epidemiology* 154 (2001): 740-747.

27. Tjonneland A., *et al.* "Alcohol intake and breast cancer risk: the European Prospective Investigation into Cancer and Nutrition (EPIC)". *Cancer Causes Control* 18 (2007): 361-373.

28. Nkondjock A and Ghadirian P. "Epidemiology of breast cancer among BRCA mutation carriers: an overview". *Cancer Letters* 205 (2004): 1-8.

29. Brunet JS., *et al.* "Effect of smoking on breast cancer in carriers of mutant *BRCA1* or *BRCA 2* genes". *Journal of the National Cancer Institute* 90 (1998): 761-766.

30. Malik Abhidha., *et al.* "Passive Smoking and Breast Cancer - a Suspicious Link". *Asian Pacific Journal of Cancer Prevention: APJCP* 9.16 (2015).

31. Nyante Sarah., *et al.* "Cigarette smoking and postmenopausal breast cancer risk in a prospective cohort". *British Journal of Cancer* 110 (2014).

32. Michael E ., *et al.* "Smoking and risk of breast cancer in the Generations Study cohort, Jones et al". *Breast Cancer Research* 19 (2017): 118.

33. Kruk Joanna. "Association of Lifestyle and Other Risk Factors with Breast Cancer According to Menopausal Status: A Case-Control Study in the Region of Western Pomerania (Poland)".

Asian Pacific Journal of Cancer Prevention: APJCP 8 (2007): 513-524.

34. Breast Cancer Family Registry. Kathleen Cuningham Consortium for Research into Familial Breast Cancer (Australasia); Ontario Cancer Genetics Network (Canada). "Smoking and risk of breast cancer in carriers of mutations in BRCA1 or BRCA2 aged less than 50 years". *Breast Cancer Research and Treatment* (2007).

35. Engeset D., *et al.* "Fish consumption and breast cancer risk. The European Prospective Investigation into Cancer and Nutrition (EPIC)". *International Journal of Cancer* 119 (2006)" 175.

36. Smith-Warner SA., *et al.* "Intake of fruits and vegetables and risk of breast cancer: a pooled analysis of cohort studies". *JAMA* 285 (2001): 769- 776.

37. Irmgard Jordan., *et al.* "Dietary patterns and breast cancer risk among women in northern Tanzania: a case-control study". *European Journal of Nutrition* 52 (2013): 905-915.

38. Freudenheim JL., *et al.* "Premenopausal breast cancer risk and intake of vegetables, fruits, and related nutrients". *Journal of the National Cancer Institute* 88 (1996): 340-348.