

Causal Attribution of Breast Cancer by Survivors in French West Indies

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Published online: 27 August 2016
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Abstract Patients frequently ask about the cause of their breast cancer. To answer, physicians refer to breast cancer risk factors based on medical reports. We aim to assess these risk factors for the point of view of survivors, a point of view which seems to differ from that of medical references. We ran a survey with open- and closed-ended questionnaires on patients' opinions about risks factors both for women in general and for their own case. We also collected data on their sources of information on this subject. Most patients had no opinion. The most frequently cited risk factors were stress, then genetic causes, and poor diet. Internet was the leading source of information for patients, followed by physicians and magazines. Our study highlights the mismatch between breast cancer risk factors as perceived by scientists and by survivors. Survivors tend to focus on non-controllable risk factors. Taking into account attribution theories of life events, an awareness of patient opinion may be valuable for psychological support of survivors, and it may be informative to record the way in which patients attribute causality for life events such as breast cancer and, more generally, all type of cancer.

Keywords Breast cancer · Causal attribution · Cancer risk factors · Health information sources

Introduction

In developed countries and indeed worldwide, breast cancer is the most common cancer in women, with the highest incidence and mortality [1]. Psychological theory indicates that humans facing this deleterious life event try to understand and give some meaning to their disease [2]. Thus, the question of its cause becomes central. Physicians form their opinions by referring to documented risk factors [3–5]. Patients, by contrast, base their opinion on several medical or nonmedical sources to which they can refer to inform themselves about the issue of causality. However, the mismatch between these two opinions is poorly documented [6]. This mismatch and patients' views on risk and/or causality of breast cancer are very important for the efficacy of prevention, screening, and support programs [6, 7]. We aimed to describe the opinion of patients recently treated for breast cancer in a territory in which the incidence of breast cancer has been growing over the past decade, probably due to the westernization of the lifestyle.

Patients and Methods

This study was conducted in islands of the French West Indies, from January 2014 to April 2015. The two islands (Martinique and Guadeloupe) each have about 400,000 inhabitants, a health care system comparable to that on mainland France and a mass screening program. The incidence of breast cancer was about 59.4 in 2008–2011 [8] and had increased to 32.8 to 45.2 per 100,000 women year in 1999–2006 [9]. This

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increase appears to a consequence of the recent westernization of society [9].

A questionnaire was proposed to patients within 2 years following treatment for breast cancer. Patients diagnosed with breast cancer linked to a gene mutation were excluded. During the study period, 115 patients were included prospectively in two public hospitals in Guadeloupe (80 patients in Pointe-à-Pitre university hospital, 20 in Basse-Terre hospital) and one in Martinique from January to April 2015 (15 patients in Fort de France university hospital). Data were collected during a face-to-face interview with a structured questionnaire administered by investigators. Basic sociodemographic data collected were as follows: age, education, marital, and occupational status. We recorded the four most important risk factors of breast cancer (RFBC) as spontaneously proposed by patients, ranked by decreasing importance. We asked about RFBC first for women in general and second for their own case. We also asked if the patient had looked for information about RFBC and if they had the sources of information consulted. Finally, we proposed five classes of RFBC (radiation, pollution, socio economic context, private life, and infection) and asked to the patients whether these RFBC were relevant to their own case. The answers were collected on a five-point Likert scale (strongly disagree, disagree, neither agree nor disagree, agree, strongly agree). If the answer was “agree or strongly agree” the patient was asked to give their own opinion about the source of the RFBC (several answers were accepted). Data were recorded and analyzed with Excel 2010 (Microsoft©). Open answers were condensed into categories by two of the investigators (PK and CS), and a third (AG) resolved any disagreement between them. The protocol was approved by the institutional ethics review board of the University Hospital of Pointe à Pitre and Abymes (A7-03 2016 ERI).

Results

The mean age of the study population was 56.7 (±10.9) years. The distribution of educational attainment was as follows: low level (<5 years of education) 12.2 %, middle level (5 to 12 years) 71.3 %, and high level (>12 years) 16.5 %. Marital status was classified as follows: single 27.8 %; married or in a couple 49.6 %; and divorced, separated or widow 22.6 %. Occupational status was as follows: unskilled and unemployed 22.6 %, housewife 13.9 %, employed 43.5 %, self-employed 4.3 %, farmer 1.7 %, and retired 13.9 %.

The RFBC spontaneously reported by patients for all women in general are presented in Fig. 1, and for their own case in Fig. 1. The first RFBC cited by patients was the same for women in general and for their own cases in 40.9 %.

Half (50.4 %) of the patients had looked for information about RFBC. This information was from the internet 55.2 %, physicians 37.9 %, magazines 36.2 %, medical books 36.2 %,

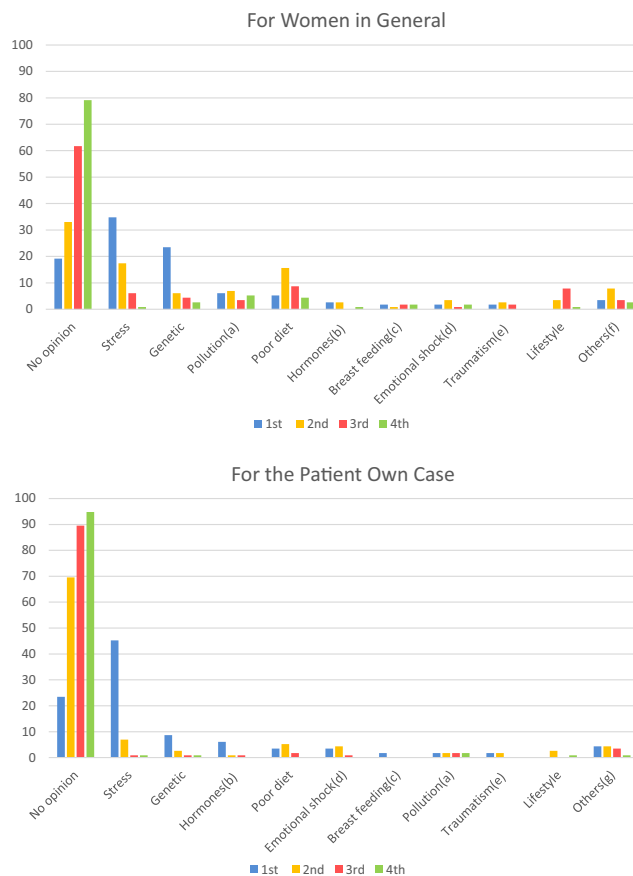


Fig. 1 The four most important risk factors of breast cancer as cited by survivors (n = 115) in percentages. **a** Of all types, including chlordecone (Kepone). **b** Contraception and other hormonal treatment. **c** Presence or absence of breast feeding. **d** Bereavement or divorce. **e** Breast traumatism. **f** Deodorant, menopause, obesity, bras, obstetric history, chronic tiredness, cell phone, work, insufficient medical follow-up, and exposure to the sun. **g** Age, menopause, early or late menopause, breast discharge, breast malformation, chronic tiredness, cell phone, coffee, and exposure to the sun

television 24.1 %, friends or entourage 17.2 %, and other sources 8.6 % including cancer associations, charities, and networks.

Thirty-one (27 %) patients agreed or strongly agreed that radiations was a RFBC, and the sources of radiation cited were (percentage of the 31 patients) as follows: mobile phones (41.9 %), micro wave oven (25.8 %), electric domestic electrical goods (12.9 %), electromagnetic radiations without any further qualification (16.1 %), medical radiology (9.7 %), the sun (6.5 %), nuclear energy (6.5 %), and no specific source (9.7 %).

Thirty-seven (32.2 %) of the patients agreed or strongly agreed that pollution was a cause with the sources cited being atmospheric (45.9 %), pesticides and particularly chlordecone (32.4 %), food (18.9 %), tobacco (2.7 %), and no specific source (10.8 %).

Forty (34.8 %) patients agreed or strongly agreed that socio economic context was a RFBC and the sources cited were as

follows: news (35 %), society and modern life (22.5 %), unemployment (17.5 %), the workplace (15 %), and no specific sources 12.5 %.

Sixty-two (53.9 %) patients agreed or strongly agreed that private life was a RFBC, with the sources being stressful life (66.1 %), emotional shock (11.3 %), poor diet (11.3 %), chronic conjugal problems (6.5 %), chronic family problems (3.2 %), domestic pollution (3.2 %), low self-esteem (3.2 %), and no specific sources (3.2 %). In the category “stressful life” as a source of RFBC, the word “stress” was emphasized by the patients. This stress was linked to chronic conjugal or family troubles, anxious temperament, or bad life choices, but in most cases, there was no further specification. In the categories “chronic conjugal and family problems,” the word “stress” was not pronounced by the patients although the situations appear to be generally similar to those described by patients for the “stressful life” category.

Eleven (9.6 %) patients agreed or strongly agreed that infection was RFBC infections in general (36.4 %); virus, for example as hepatitis B virus (18.2 %); recurrent candida infections (9.1 %); uterus/cervical infection (9.1 %); and not specified (18.2 %).

Discussion

We found that most treated breast cancer patients did not have any opinions about the causes or RFBC. Those who had an opinion reported that the causes were stress, genetic factors, and pollution were the most important RFBC. These results are consistent with a recent literature review on causal attributions among women previously diagnosed with breast cancer [6].

These results were obtained with open-ended and closed-ended questionnaires. In the open-ended questions, the word “stress” was clearly pronounced by patients. Some patients mentioned chronic situations, notably conjugal and family problems, which were considered to be stressful situations. However, we chose to classify various particular events, like the death of a close relative/friend, separately. Such events, a short time (some few weeks) before the diagnosis did not seem to us to be similar to chronic stressful situations which last several months or years. However, we cannot exclude the possibility that some patients mixed up these two notions.

This idea of psychological stress as a RFBC is supported by some studies [10, 11]. There have been reports that depression of immune functions related to stress, in animal models and humans, might lead to promotion and progression of some types of cancer [12]. However, other mechanisms, as yet unidentified, cannot be excluded as possible explanations of the link between stress and cancers. Furthermore, epidemiological results, as summarized in several reviews, generally argue against the existence of any link between breast cancer and

stress [13–16]. A protective effect has even been reported in specific stress conditions [17–19]; this may be a consequence of the reduction of endogenous estrogen levels reported to be associated with stress in humans [18].

Genetic and food are both RFBC cited by patients and reported as standard RFBC in medical reports. By contrast, factors linked to gynecological and obstetrical history, other than the use of contraception and hormones, were less frequently mentioned by patients (Fig. 1). These findings indicate that medical data relative to RFBC are not well known by the general public. This is further supported by the high rates of patients who said that they had no opinion about RFBC in answers to open-ended questions (Fig. 1), and the only small number of patients who asked their physician for information about RFBC.

The RFBC that can be controlled by the patient, such as diet or breast feeding, are less cited than RFBC which cannot be controlled, like stress, pollution, and genetic causes. This reluctance to cite RFBC that can be controlled by the patient appears to be a self-protecting psychological strategy to prevent self-blame [20]. In attribution theory, negative life events are likely to be attributed to external causes [2]; thus, the attribution of the disease to uncontrollable causes may be part of a process of coping with breast cancer [6]. The local context should also be considered in this process of definition of RFBC by patients. The French West Indies territories are subject to specific, long-term, environmental pollution by chlordecone (or Kepone), a pesticide used in banana farming [21]. Chlordecone pollution, and especially the carcinogenic activity, has been extensively debated in the local media. Consequently, it is not surprising that it was cited by several patients in our survey.

The source of medical information for patients is no longer limited to physicians. Our study agrees with reports which give internet a leading position as the public’s source of medical information [22]. Information available in the media and in the social media in particular may lead to under or overestimation of a risk factor [6]. It may also publicize risk factors for which there is no or limited scientific support, for example mobile phones and microwave ovens as cited in our study population. However, it has been reported that patients’ views on RFBC, and especially the contribution of modifiable lifestyle RFBC, appear to have remained largely unchanged over the last three decades despite the increase in nonmedical information sources [6]. It seems to be plausible that views expressed about RFBC by patients who have been treated for breast cancer are not based solely on their awareness of information about RFBC. Psychological mechanisms for preservation of self-esteem seem also to contribute to this multifactorial process; despite scientific evidence, there may be denial of RFBC which are modifiable and controllable, and which have been reported to increase distress in cancer survivors [23]. By contrast, some RFBC attributed by patients may

simply be for psychological self-protection [20]. This possibility is consistent with higher rate of patients without an opinion for their own case than of women in general with no opinion about RFBC (Fig. 1).

Our study is only descriptive and did not evaluate the real or perceived risk. Indeed, we aimed to qualify only the risk as perceived by the patient. Such information may be important for motivation both for breast cancer prevention and adherence to screening programs [7, 24]. The observed opinions about, and perception of, cancer risk depend on the methods used to collect answers [7]. The corresponding attribution theory is complex, and takes into account two aspects to stress; on the one hand, the phenomena perceived as aggressive are stressors, and on the other hand, the feelings and manifestations associated with the reaction to an event can also be stressors. We cannot distinguish between these two aspects in patients' answers in our study. Categories in studies on RFBC and causality are not uniform and this makes comparison between studies difficult. Indeed, the categories we use here for the RFBC as reported by patients were categorized by investigators and are open to criticism.

In conclusion, the issue of RFBC identified by survivors of breast cancer requires further investigation, and both large and small local studies would be useful. There is substantial evidence that beliefs about RFBC or the causes of breast cancer are relevant to the promotion and/or the success of support for breast cancer survivors. Thus, we suggest that it would be valuable for medical files of breast cancer survivors and more generally all cancer survivors to indicate opinions or knowledge about cancer risks or causality.

Acknowledgments The authors thank Dr. Laurent Benoit for his help with collecting data.

Compliance with Ethical Standards

Conflict of Interest This study was supported financially by Roche France®. This company did not have any role in the design, analysis, or interpretation of this study or in writing the manuscript.

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