Idealization as a Risk Factor for Breast Cancer in Patients with Breast Disease – A Prospective Case-control Study in Kuopio, Finland

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Abstract. *Background: Earlier studies have described a cancer prone personality that is believed to predispose an individual to developing cancer. This cancer prone personality has been shown in studies related to stress. To our knowledge, the association between idealization and risk of breast cancer are rarely considered together. Patients and Methods: This study is an extension of the Kuopio Breast Cancer Study. Women with breast symptoms were referred by their physicians to the Kuopio University Hospital (Finland) and were asked to participate in this study. These women (n=115) were interviewed and all study variables were obtained before any diagnostic procedures were carried out, so neither the investigator nor the subjects knew the final diagnosis of breast symptoms at the time of the interview. The research method used was the semistructured in-depth interview method. The investigator used the Montgomery-Åsberg Depression Rating Scale (MADRS) to evaluate the depression of the study subjects. All study subjects were also asked to complete standardised questionnaires (Beck Depression Inventory and Spielberger Trait Inventory). The investigator estimated the amount of idealization using a 3-point scale: grade I, no idealization; grade II, mild/moderate idealization; grade III, severe idealization. Results: The clinical examination and biopsy showed breast cancer (BC) in 34 patients, benign breast disease (BBD) in 53 patients and 28 study subjects were shown to be healthy (HSS). The results indicated that breast cancer patients used more idealization of childhood and motherhood (p=0.04) than the BBD and HSS groups. Idealization was significantly associated with our increased breast cancer risk (odds ratio=1.6, confidence interval=1.1-2.5, p=0.03). Conclusion: The results of this study support a moderate association between idealization and increased breast cancer risk. However, the biological*

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explanation of the association is unclear and it might be that idealization and the coping and defensive process impact indirectly, by affecting behaviours such as diet or sleep, or directly on neuroimmunological or hormonal systems.

A number of risk factors for breast cancer have been identified. Hormonal factors like early age at menarche, later age at menopause, later age at first-full term pregnancy and hormone replacement therapy are known to be the main risk factors for sporadic breast cancer (1). In addition, life-style factors such as obesity, smoking, alcohol consumption and physical activity, appear to contribute to the increased risk for this malignancy, although the results concerning these life-style factors are inconsistent (1-7). Psychological factors, such as stressful and adverse life events, are widely thought to play a role in the aetiology of cancer in general, and of breast cancer in particular (8-13). Many case-control studies have also investigated the relationship between anxiety, depression, the of history of psychiatric symptoms and the risk of breast cancer in relation to the suppression of emotions, anger in particular (14-21).

We prospectively investigated breast cancer risk in relation to anxiety, coping and defending, depression, the history of psychiatric symptoms and stressful and adverse life experiences among patients with breast disease in Kuopio Breast Cancer Study (22-24). The results of our study support an overall association between stressful life events, coping and defending and breast cancer risk.

To our knowledge, the association between idealization and coping and defence and risk of breast cancer is rarely considered together, and therefore we carried out a prospective study to examine the role of idealization as a risk factor for breast cancer in women with breast symptoms referred to the Kuopio University Hospital (Finland).

Patients and Methods

The Kuopio Breast Cancer Study is a multi-disciplinary cooperative project conducted by different departments of the University of Kuopio

Table I. *Characteristics of the study subjects. Results are shown for patients with breast cancer (BC), benign breast disease (BBD) and healthy study participants (HSS).*

Variable	BC (n=34)	BBD (n=53)	HSS (n=28)	*P*-value
Age (mean, years)	51.6	47.6	45.7	ns
Height (mean, cm)	164.4	162.3	160.8	ns
Body weight (mean, kg)	72.5	67.8	68.3	ns
Age at menarche (mean, years)	13.4	13.4	13.4	ns
Age at birth of I child (mean, years)	25.2	25.0	25.0	ns
Age at menopause (mean, years)	47.9	48.9	50.0	ns
No. of children (mean)	2.6	2.4	2.5	ns
Parity	31/34 (91%)	44/53 (83%)	23/28 (82%)	ns
Breast feeding (mean, months)	3.6	3.4	3.9	ns
Using of oral contraceptives	13/34 (38%)	25/53 (47%)	18/28 (64%)	ns
HRT*	27/34 (79%)	36/53 (68%)	14/28 (50%)	ns
Premenopausal	13/34 (38%)	28/53 (53%)	18/28 (64%)	ns
Postmenopausal	21/34 (62%)	25/53 (47%)	10/28 (36%)	ns
History of previous BBD	18/34 (53%)	22/53 (42%)	10/28 (36%)	ns
Family history of BC	1/34 (3%)	5/53 (9%)	5/28 (18%)	ns
Use of alcohol	21/34 (62%)	31/53 (58%)	13/28 (46%)	ns
Smoking	15/34 (44%)	21/53 (40%)	10/28 (40%)	ns

*HRT=use of hormonal replacement therapy.

and the Kuopio University Hospital. The participants in the project included all women who were referred to the Kuopio University Hospital for breast examination between April 1990 and December 1995. The Kuopio Breast Cancer Study follows the protocol of the International Collaborative Study of Breast and Colorectal Cancer coordinated by the European Institute of Oncology in Milan, and was initiated as a SEARCH program through the International Agency for Research on Cancer. The collaborative study is based on the assumption that breast cancer and colorectal cancer may have common risk factors. Study centers for the breast cancer study are situated in Canada, Finland, Greece, Ireland, Italy, Russia, Slovakia, Spain and Switzerland (25). The participants of the Kuopio Breast Cancer Study comprise those women showing breast cancer symptoms (a lump in the breast or in the axilla, pain in the breast, bleeding from the nipple, nipple discharge, skin dimpling) or an abnormality of the breast detected during outpatient consultations referred to the Surgical Outpatient Department at the Kuopio University Hospital, Finland. There had been no pre-selection of the study participants and the indications for referral in this study are in line with our previous results from a Breast Cancer Diagnostic Unit in Finland (26). We maintain that our study sample can be considered clinically representative for this type of prospective case-control study design.

This case-control study is an extension of Kuopio Breast Cancer Study (27-28). The study was approved by the Joint Committee of the University of Kuopio and the Kuopio University Hospital. Participation was based on written consent. Women with breast symptoms or a suspect breast lump had been referred by physicians to the Kuopio University Hospital (Finland) during the study period from January 1991 to June 1992. Women were asked to participate in the study and were interviewed by a psychiatrist (P.O.) before any diagnostic procedures (clinical examination and biopsy), so neither the interviewer nor the patient knew the diagnosis at the time of the interview. The interviews were recorded (P.O.) and the ratings were completed before the final diagnosis. The clinical examination, mammography and biopsy showed breast cancer (BC) in 34 (29.6%)

patients, benign breast disease (BBD) in 53 (46.1%) and healthy breasts (HSS) in 28 (23.4%) subjects (Table I).

Assessment of life events and stress. The research method was a semistructured in-depth interview. At the beginning of the interview, each patient drew their 'life line' and a line describing being a woman, on which the interview was then based. In 'the draw a line of your life' P.O. asked the patient to draw positive life experiences (the 'good times') with lines pointing upwards and negative life experiences (the 'hard times') with lines pointing downwards. Adverse and stressful life events were evaluated over the whole lifespan, with particular reference to the 10 years prior to admission. The adverse or stressful life events and the context surrounding them were marked on the 'life line' paper during the interview. After the interview, P.O. then rated the life events according to the degree of threat or stress they were likely to pose to a particular study participant, and each adverse or stressful life event was graded on a 5-point scale: grade I (one point) indicating non-threatening event and grade V (5 points) severely threatening event. The defences used were also assessed on a 5-point scale: grade I (one point) indicating very defensive, denial, and grade V (5 points) non-defensive. A 'Working through and actively confronting the stressful event' variable was also rated on a 5-point scale: grade I (one point) indicating the event had not been resolved and grade V (5 points) it had been fully resolved. These measurements were put together in the final statement, with a score of 1 to 2 points on the scale meaning little or mild loss/stress, and 5 meaning very hard loss/stress.

The rated case record included loss events from childhood (under three years of age and 4-12 years of age), adolescence (13-23 years of age), adulthood and in particular 10 years prior to the investigation.

Assessment of idealization. P.O. estimated the characteristics of the idealization of: childhood and adolescence; womanhood and motherhood; own children, spouse and parity; present life situation;

and life in general, in the BC, BBD and HSS groups using a 3-point scale: grade I, no idealization; grade II, mild/moderate idealization; grade III, severe idealization.

Coping and defence strategies. P.O. used a modified Haan coping and defence inventory (29). This inventory is divided into ten scales, each with a subscale from grade 0 to grade 3. Zero means no definition, 1=coping, 2=defending and 3=fragmentation. In addition, the researchers estimated the patients' ability to cope (scale 1 to 5), the amount of defensiveness (scale 1 to 5) and fragmentation (scale 1 to 5).

Beck Depression Inventory (BDI). The women completed the Beck Depression Inventory (BDI) (30, 31) with 21 variables. The investigator used a modified inventory divided into three grades: grade I (0-13), no depression; grade II (14-24), moderate depression; grade III (over 24), severe depression.

Spielberger Trait Inventory. All study participants completed the Spielberger Trait Inventory (32). Trait anxiety was assessed using the subscale from the Inventory, the 10 items of which refer to how a person generally feels, with a higher total score reflecting higher trait anxiety (20-80 range). The investigator rated the test as follows: grade I (20-29), seldom anxious; grade II (30-49), sometimes anxious; grade III (50-69), often anxious; grade IV (70-80), always anxious.

Montgomery Åsberg Depression Rating Scale (MADRS). The Montgomery Åsberg Depression Rating Scale (MADRS) with 10 variables (scores from 0 to six) was used to evaluate the depression of the study participants (33) and the test was rated as follows: grade I (0-6), no depression; grade II (7-19), mild depression; grade III (20-34), moderate depression; and grade IV (35-60), severe depression.

Statistical analysis. Significance of the results was calculated with the SPSS/PC statistical package (SPSS Inc., Chigaco, Illinois, USA). Correlations and differences between the study groups (BC, BBD and HSS groups) were measured with a 2-sided Chi-square test and non-parametric Kruskal-Wallis variance analyses. Results were considered statistically significant at p-value <0.05. Associations between the major study variables and breast cancer risk were analysed with an unconditional logistic regression to estimate risk ratios (RRs) and 95% confidence intervals (CI).

Results

The mean (standard deviation=SD, range) age of the breast cancer (BC) patients was 51.5 (11.1, 32-74) years. The corresponding figures for the patients with benign breast disease (BBD) were 47.5 (10.9, 25-75) years and for the healthy study subjects (HSS) 45.7 (13.2, 20-70) years. Although the patients in the BC group were older than those in the BBD or HSS groups, the age difference was not statistically significant (p=0.12). The majority of the patients (85/115, 74%) were married or living in a steady relationship. Almost half of the women (41.7%) had graduated from primary school, and 25% had a college education. By profession the patients represented industrial and service employees (25.2%), office employees (10.4%), health care employees (8.7%) and farmers (8.7 %),

Table II. *The characteristics of the 'idealization of childhood' and the 'idealization of adolescence' in the BC, BBD and HSS groups.*

Severity of idealization	BC		BBD		HSS		P-value (overall)
Grade	N	%	N	%	N	%	
Childhood							
I (none	24	70.6	46	86.8	23	82.1	0.10
II (mild/moderate)	6	17.6	6	11.3	5	17.9	
III (severe)	4	11.8	1	1.9	–	–	
Adolescence							
I (none	29	85.3	47	88.7	27	96.4	0.50
II (mild/moderate)	5	14.7	5	9.4	1	3.6	
III (severe)	–	–	1	1.9	–	–	

while almost 23.5% were retired. The combined mean gross income of both spouses in the patients with BC was 36100€ per year. The corresponding income for patients with BBD was 27714€ per year. The patients with BC were significantly (p=0.03) wealthier than the patients with BBD and HSS, as estimated by the combined gross income of the both spouses. The groups differed only slightly from each other as to other factors (Table I).

Psychological self-report questionnaires (BDI and Spielberger Trait) and MADRS. The mean (SD) BDI score of the BC group was 8.4 (6.9) with 8.8 (7.4) and 7.1 (7.3) (p=ns) for the BBD and HSS groups, respectively. The mean (SD) MADRS score of the BC group was slightly higher 11.4 (9.2) than that of the BBD group (10.7 (9.2)) and the HSS group (8.4 (9.7)) (p=ns). The mean (SD) Spielberger Trait Inventory differed only slightly between the groups, 40.1 (8.6), 41.5 (7.2) and 39.1 (6.4) for BC, BBD and HSS groups respectively (p=ns).

The characteristics of idealization of childhood and adolescence in the BC, BBD and HSS groups. The characteristics of idealization of childhood and adolescence in the BC, BBD and HSS groups were categorized as follows: severe (grade III), mild or moderate (grade II) and no idealization (grade I). The characteristics of idealization in the study subjects are presented in Table II. Four patients (11.8%) of the BC group reported severe idealization of childhood whereas only one patient (1.9%, 1/53) of the BBD and none (0/28) of the HSS group displayed severe idealization of childhood. The BC, BBD and HSS groups differed only slightly in their idealization of adolescence (Table II).

The characteristics of idealization of womanhood and motherhood in the PC, BBD and HSS groups. The characteristics of idealization of womanhood and motherhood in the BC, BBD and HSS groups are provided in Table III.

Table III. *The characteristics of the 'idealization of womanhood' and the 'idealization of motherhood' in the BC, BBD and HSS groups.*

Severity of idealization	BC		BBD		HSS		P-value (overall)
Grade	N	%	N	%	N	%	
Womanhood							
I (none)	33	97.1	52	98.1	28	100.0	0.67
II (mild/moderate)	1	2.9	1	1.9	–	–	
III (severe)	–	–	–	–	–	–	
Motherhood							
I (none)	19	61.2	22	51.2	20	76.9	0.04
II (mild/moderate)	6	19.4	18	41.9	5	19.2	
III (severe)	6	19.4	3	6.9	1	3.9	

The characteristics and severity of idealization were assigned as follows: severe (grade III), mild/moderate (grade II), and no idealization (grade I). The patients with breast cancer had more severe idealization of motherhood (6/31 patients, 19.4%) than the patients with BBD (severe idealization in 3/43 patients, 6.9%) or the healthy study subjects (1/26 patients, 3.9%) (*p*=0.04).

The characteristics of idealization of own children, spouse and parity in the BC, BBD and HSS groups. The characteristics of the idealization of own children, spouse and parity in the BC, BBD and HSS are given in Table IV. The patients with breast cancer had a more mild/moderate idealization of their spouse (27.6%, 8/29 patients) than the patients with BBD (10.9%, 5/46 patients) or the healthy study subjects (4.5%, 1/22 patients). Four patients (14.8%, 4/27) of the BC group reported severe idealization of parity whereas only two patients (4.5%, 2/44) of the BBD group and none (0/28) of the HSS group displayed severe idealization of parity.

The characteristics of idealization of present life situation and the idealization of life in general in the BC, BBD and HSS groups. The characteristics of idealization of present life situation and the idealization of life in general in the BC, BBD and HSS groups are shown in Table V. The patients with breast cancer had a more severe idealization of their present life-situation (14.7%, 5/34 patients) than the patients with BBD (5.7%, 3/53 patients) or the healthy study subjects (3.6%, 1/28 patients). In addition, the patients with breast cancer had a more severe idealization of life in general (14.7%, 5/34 patients) than the patients with BBD (1.9%, 1/53 patients) or the healthy study subjects (7.1%, 2/28 patients).

The variables in this study and breast cancer risk ratio (RR) with the 95% confidence interval (CI). The variables in this study and the breast cancer risk ratio (RR) with the 95% confidence

Table IV. *The characteristics of the 'idealization of own children' and the 'idealization of spouse' and the 'idealization of parity' in the BC, BBD and HSS groups.*

Severity of idealization	BC		BBD		HSS		P-value (overall)
Grade	N	%	N	%	N	%	
Childhood							
I (none)	24	82.8	37	86.0	19	86.4	0.70
II (mild/moderate)	3	10.3	5	11.6	3	13.6	
III (severe)	2	6.9	1	2.3	–	–	
Spouse							
I (none)	19	65.5	39	84.8	19	86.4	0.14
II (mild/moderate)	8	27.6	5	10.9	1	4.5	
III (severe)	2	6.9	2	4.3	2	9.1	
Parity							
I (none)	20	74.1	31	70.5	15	83.3	0.19
II (mild/moderate)	3	11.1	11	25.0	3	16.7	
III (severe)	4	14.8	2	4.5	–	–	

Table V. *The characteristics of the 'idealization of present life situation' and the 'idealization of life in general' in the BC, BBD and HSS groups.*

Severity of idealization	BC		BBD		HSS		P-value (overall)
Grade	N	%	N	%	N	%	
Present life-situation							
I (none	24	70.6	43	81.1	21	75.0	0.39
II (mild/moderate)	5	14.7	7	13.2	6	21.4	
III (severe)	5	14.7	3	5.7	1	3.6	
Life in general							
I (none	24	70.6	46	86.8	24	85.8	0.17
II (mild/moderate)	5	14.7	6	11.3	2	7.1	
III (severe)	5	14.7	1	1.9	2	7.1	

interval (CI) and *p*-value of significance are shown in Table VI. The variables of this study correlated only slightly with increased breast cancer risk (Table VI). The 'idealization' variable characterized by P.O. correlated slightly with increased breast cancer risk (RR=1.6).

Discussion

Breast cancer is the most common cancer in women in North America and in Western Europe (1). In Finland, 3,787 new cases of female breast cancer were diagnosed in 2003, accounting for 31.5% of all cancer in women (34), corresponding to an age-adjusted incidence rate of 84.3 cases per 100,000 women per year. The overall 5-year survival rate of breast cancer patients is close to 80% in Finland, even though 822 breast cancer deaths were documented in 2001 in Finland (34).

Table VI. *The study variables and the breast cancer risk ratio (RR) with 95% confidence interval (CI) and P-value of significance.*

Study variable	RR	CI	*P*-value
Idealization	1.6	(1.1-2.5)	0.03
Spielberger (A-trait)	1.0	(0.95-1.11)	0.49
MADRS	1.0	(0.95-1.11)	0.37
Beck (BDI)	1.0	(0.92-1.11)	0.86
Forsen-score (0-2 years)	1.0	(0.96-1.04)	0.92
Forsen-score (2-6 years)	1.0	(0.96-1.09)	0.21

Epidemiological research on personality and breast cancer risk has been motivated by theories of a so-called 'cancer-prone personality' (35). Case-control and cohort studies take into account personality and confounding factors at the individual level. Epidemiological studies of these factors and breast cancer risk are more common, because they are easier, quicker and cheaper to carry out than the case-control and cohort studies.

The important bias related to case-control studies is recall bias, which occurs, for example, if cases report their life experiences differently from controls. This may happen because subjects have often thought about their previous experiences in order to find causes for their breast cancer. To avoid recall bias, we conducted this case-control study with a so called 'limited prospective study design', women were asked to participate in the study, were interviewed and reports on psychological factors were obtained before any diagnostic procedures, so neither the investigator nor the subjects knew the diagnosis at the time of interview. One potential bias arises from age being a confounding factor and some studies have been criticized on such methodological grounds as limited controlling for age (36). In our study, the BC group was 4.0 years and 5.9 years older than the BBD group and the HSS group, respectively. However, no statistically significant age difference between these groups was found ($p=0.12$).

We maintain that our study sample can be considered clinically representative for this type of prospective case-control study design. It should be noted that the control group (healthy participants) of our study is not representative of the whole population, since it consisted of patients who presented primarily with breast symptoms.

The study sample can be considered clinically representative of this type of prospective case-control study design if the variables characterized by the investigator and the variables characterized by the subjects correlate. In our study the variables reported by the investigator, the MADRS and depression variables correlated with high significance (*p*-value <0.001) to those variables reported by the study participants BDI, A-trait, Forsen-score (0-2 years) and Forsen-score (2.6 years). The 'anxiety' variable characterized by the investigator correlated to the A-trait and Forsen-score (0-2 years) variable reported by the study participants (*p*-value <0.05) (21).

To our knowledge, the association between idealization and risk of breast cancer is rarely considered together and we have not found any previous studies from the literature. Since idealization, coping and defence are closely related, we feel that our previous results should be discussed here (24). The findings of earlier case-control studies of the coping characteristics vary from no association (10, 37-39) to some association (8), and therefore the evidence is insufficient to conclude that coping and defending contribute to breast cancer. We used the modified coping and defence inventory of Haan to evaluate the functioning of ego. The three groups (BC, BBD and HSS) did differ from each other as to the characteristics of coping and defence mechanisms. The BC group used significantly more defence mechanisms: denial, intellectualising, rationalisation, and reaction formation than did the BBD and HSS groups, and the defence mechanisms were significantly associated with increased breast cancer risk. The breast cancer patients used fewer coping mechanisms: concentration, intellectualising, logical analysis, empathy, ambiguity tolerance, regression-ego, sublimation and substitution. In summary, our findings of the moderate relationship between coping and defending (and idealisation) are in line with the findings of the study by Chen (8), who recently specifically investigated coping and breast cancer risk.

Conclusion

The results of this study support a moderate association between the idealization process and breast cancer risk. However, the biological explanation of the association is unclear and might be that idealization, coping and defending processes impact indirectly, by affecting behaviours such as diet or sleep, or directly on neuroimmunological or hormonal systems.

Acknowledgements

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