

## **Synergy Between Sexual Abuse and Cervical Cancer in Causing Sexual Dysfunction**

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*Experiencing a sexual abuse creates a life-long traumatic memory. The life-long effect of such abuse on sexuality, well-being, the risk of contracting cervical cancer, or problems after treatment for cervical cancer is not known. A population-based follow-up study in 1996–97 that used an anonymous postal questionnaire for data collection, 256 women with stage IB-IIA cervical cancer registered in 1991–92 in Sweden, and 350 women without cervical cancer*

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*frequency matched for age and region of residence, provided information. Among the women with a history of cervical cancer and the control women, 46 (18%) and 50 (15%), respectively, reported a history of sexual abuse. The follow-up was 1–70 years after the sexual abuse. The relative risk (with 95% confidence interval) of decreased well-being was 2.4 (1.1–5.2) among controls and 2.7 (1.1–6.4) among former cervical cancer patients. A history of both sexual abuse and cervical cancer gave a relative risk of 30.0 (7.0–129.0) for superficial dyspareunia. Sexual abuse increased the risk of sexual problems after treatment. The sexually abused cervical cancer patients were generally less willing than other patients to trade off possible maximal survival and forgo parts of the treatment. A history of sexual abuse and cervical cancer are both independent risk factors for sexual dysfunction and decreased well-being, and there may be a large synergy when both factors are combined. Diagnosis and treatment of cervical cancer may be improved by recognition of a sexual abuse history.*

Experiencing sexual abuse creates a life-long traumatic memory (Anonymous, 2000; Hexel & Sonneck, 2002; Young & Katz, 1998) and may have a negative impact on the victim's sexual life (Fromuth, 1986; Greenwald, Leitenberg, Cado, & Tarran, 1990) and increase the risk of gynecological diseases, including cervical cancer. Moreover, the disease symptoms and the treatment of cervical cancer may be perceived as a continuation of the original violation or may reinforce the sense of disempowerment, reactivating the trauma. It is not known, however, if a history of sexual abuse induces a long-life risk of decreased well-being and sexual dysfunction in cervical cancer survivors or if it influences the risk of contracting cervical cancer or chronic problems after its treatment.

The reported prevalence of sexual abuse histories among women ranges from 1.5% (Erickson & Rapkin, 1991) up to 52% (World Health Organization, 2000). Nordic studies report 3–17% (Hedin, Grimstad, Möller, Schei, & Janson, 1999; Schei, 1990; Swahnberg et al., 2004). Selection, underreporting, varying definitions of abuse (abuse, assault, unwelcomed sexual experience, sexual violence), different periods of time, sociodemographic factors, and age influence the figures. Prior sexual abuse may influence risk-taking behavior (Erickson & Rapkin, 1991; Riggs, Alario, & McHorney, 1990; Springs & Friedrich, 1992), delay cancer detection (Farley, Golding, & Minkoff, 2002; Harsanyi, Mott, Kendall, & Blight, 2003; Lawson, 1998), and also lead to neglect of health and fear of gynecological examinations (Robohm & Bottenheim, 1996). No previous study has investigated whether a history of sexual abuse predicts cervical cancer risk.

With population-based registers and a civil registration number for all citizens, Sweden has good conditions for unselected population-based data collections. In this study, we investigate the long-term effects of sexual abuse on well-being, psychological symptoms, and sexual dysfunction as well as, abuse victims' risk of contracting cervical cancer or suffering from distressful symptoms after therapy for cervical cancer.

## MATERIALS AND METHODS

The patient population included all ( $n=332$ ) patients under the age of 80 with early (International Federation of Gynecology and Obstetrics (FIGO) stages IB-IIA; Benedet et al., 2001) cervical cancer registered at the seven Departments of Gynaecological Oncology in Sweden between January 1, 1991, and December 31, 1992. We randomly chose from the Swedish Population Register a control group of 489 women without cervical cancer, matched for age and region of residence. We collected the information using a questionnaire that was posted to patients and controls between November 1996 and April 1997.

We constructed a preliminary questionnaire based on in-depth interviews with patients, discussions with experienced physicians, investigations in our group (Helgason et al., 1996; Rådestad, Steineck, Nordin, & Sjögren, 1996), and previous investigations (Andersen & van der Does, 1994; Thranov & Klee, 1994). The questionnaire was designed to assess not only the characteristics of symptoms but also the level of distress experienced by the women as a result of specific symptoms. The association between symptom characteristics (occurrence, intensity, duration, quality) and the distress each symptom produced was clearly distinguished by means of specific questions. We tested and modified the questionnaire based on face validity with 10 patients. After that, we carried out two preparatory studies; in the first study, we had a low response rate among controls. After this we changed the means for data collection and further modified the questionnaire. A second preparatory study had response rates of 24/30 (80%) in controls and 25/30 (83%) in patients, and we proceeded to the main data collection.

The questions pertaining to sexual abuse were: "Have you ever been subjected to any kind of sexual abuse?" (with the possible answers "No, never," "Yes, I have been subjected to some degree of sexual abuse," "... a moderate degree...", and "... a severe degree..."); "Have you been subjected to repeated sexual abuse?" (with the possible answers "Not relevant," "No," and "Yes"); "Have you been subjected to incest?" (with the possible answers "No" and "Yes"); and "At what age were you first subjected to sexual abuse?" The valuation of the degree of sexual abuse was made by the individual woman and was not based on a judicial penalty scale.

We examined psychological and quality-of-life factors using validated scales for anxiety (State-Trait Anxiety Inventory—Trait (STAI-T); Spielberger,

Gorsuch, Lushene, Vagg, & Jacobs, 1983), depression (Center for Epidemiological Studies Depression Scale (CES-D); Radloff, 1977), and general well-being (Göteborg Quality of Life, GQL; Tibblin, Tibblin, Peciva, Kullman, & Svärdsudd, 1990). On the STAI-T and CES-D, each statement is rated on a 4-point verbal Likert scale. We calculated a summary score with a maximum value of 80 and a minimum value of 20, then divided that number by 20 (the number of statements in each scale), giving a possible maximum value of 4 (worst possible). We excluded responses with 18 or fewer ratings (of 20 possible). The GQL is a Swedish instrument with questions concerning 15 areas of quality of life (e.g., home and family, residence, work, economy, mood, patience, appreciation inside and outside the home), each with a possible score of 1 to 7. We calculated a summary score and divided by 15 (the number of items), producing a possible best score of 7 and a possible worst score of 1. Furthermore, we used a 7-point digital scale to assess psychological well-being, anxiety, depression, level of energy, and physical well-being, with 1 corresponding to a low or nonexistent prevalence or intensity and 7 corresponding to a high or constant prevalence or intensity of the state or condition, covering, for example, the lowest possible and the best possible well-being. We also collected information on potential confounding and effect-modifying variables, including level of education, occupation, social status, religion, other diseases (such as hypertension, diabetes mellitus, psychiatric disorders), operations, and medication for preexisting conditions and hormone-replacement therapy. In a series of trade-off questions, the women with a history of cancer were asked hypothetically to consider whether they would risk a poorer prognosis in exchange for foregoing surgery, intracavitary radiotherapy, or external radiotherapy. An alternative (hypothetical) treatment with fewer side-effects was outlined, with the risk of a reduced survival rate, specified as a percentage.

We mailed an introductory letter to the women with an explanation of the study objectives. Those who did not return the enclosed response form were telephoned after 2 weeks. We mailed a questionnaire to those who agreed to be included. The women answered the questionnaire anonymously and returned a registration form in a separate envelope. Information about the respective treatments was obtained from the patients in such a way as to safeguard anonymity.

The standard treatment modality in Sweden for earlystage cervical cancer is surgery with or without preoperative intracavitary radiation therapy, depending on local tradition. The surgery typically consists of radical hysterectomy and pelvic lymph node adenectomy. Patients with lymph node metastases or other poor prognostic signs (close or positive surgical margins) are typically treated with postoperative external radiotherapy. Patients not suited for surgery (because of advanced age, concomitant disease) are treated with radiotherapy alone. This study was approved by the Regional Ethics Committee at the Karolinska Institute.

## STATISTICAL ANALYSIS

We dichotomized the responses to the questionnaire; the results are presented as relative risks, calculated as the proportion of women with the condition reporting the outcome, divided by the proportion of women without the condition reporting the outcome. We calculated estimated relative risks (RR) and associated 95% confidence intervals using the Mantel-Haenszel method.

## RESULTS

Information was supplied by 256 (77%) of the 332 cases and 350 (72%) of the 489 controls (Table 1). The mean ages of the case and control women at the time they completed the questionnaire were 51 and 52 years, respectively, but the distribution between the groups varied somewhat.

Among the women with a history of cervical cancer, 18% (46/250) reported a history of sexual abuse, whereas the corresponding figure among controls was 15% (50/332; Table 1). Five percent (12/250) of women with a history of cervical cancer and 1.5% (5/332) of controls reported a history of severe abuse. A history of incest was more common among the patients than the controls, 4% (10/248) and 1.5% (5/334), respectively. Women with a history of sexual abuse more frequently than others were given adjuvant external radiotherapy (45% vs. 32%). The women with a history of cancer were younger than the controls at the time of the first abuse. The age at the first intercourse was slightly lower among the women with a history of cervical cancer than among the others. This difference was further emphasized when we compared abused and nonabused women. The estrogen use differed between abused and nonabused women with a history of cancer. None of the abused former patients used topical estrogen, compared with 16% (26/203) of the nonabused former patients. Sociodemographic factors, such as education and employment status, differed somewhat.

Overall low satisfaction with their current sex life, distress if current problems were to persist, and the impact of sexual dysfunction on well-being were significantly greater among women with a history of sexual abuse and cervical cancer than among those without such a history (Table 2). Women with a history of sexual abuse reported low sexual desire less frequently than did women without a history of sexual abuse. Virtually all other symptoms of sexual dysfunction or psychosocial outcomes asked about were more frequent and more distressful among the women with a history of sexual abuse than among those without such an experience, irrespective of a history of cancer.

The relative risks for superficial dyspareunia were 7.9 (sexual abuse, no cervical cancer), 12.1 (cervical cancer, no sexual abuse), 30.0 (both factors), and 1.0 (no factor; Table 2). Some differences in the relative risk of superficial

**TABLE 1.** Sexual Abuse in Women Five Years After Therapy for Cervical Cancer and in Controls

Aspects assessed	Controls		Women with a history of cancer		Odds ratio (OR) (95% confidence interval)
	Abused	Non-abused	Abused	Non-abused	
Sexual abuse, any degree (mild, moderate or severe)*	50/332 (15%)		46/250 (18%)		1.3 (0.8–2.0)
Sexual abuse, moderate or severe degree*	21/332 (6%)		21/250 (8%)		1.4 (0.7–2.5)
Sexual abuse, severe degree only*	5/332 (2%)		12/250 (5%)		3.3 (1.1–9.5)
Repeated abuse	18/333 (5%)		19/249 (8%)		1.4 (0.7–2.8)
Incest	5/334 (1%)		10/248 (4%)		2.8 (0.9–8.2)
Age when answering questionnaire, years (mean)	51.1		50.6		
	45.6	52.1	43.7	52.1	
Age at first abuse, mean (range), years	16.1 (1–43)		14.6 (1–40)		
Age at first abuse, under 90th percentile, mean (range), years	14.0 (1–25)		12.8 (1–22)		
Age at sexual debut, mean (range), years	18.0 (12–38)		17.1 (13–25)		
	17.5	18.0	16.1	17.3	
Age at sexual debut, under 90th percentile, mean (range), years	17.1 (12–22)		16.6 (13–19)		
	16.2	17.3	15.7	16.8	
Marital status, current, number (%)					
Married or cohabiting	34 (68)	214 (76)	24 (55)	140 (68)	
Has a partner but lives alone	4 (8)	16 (6)	7 (16)	16 (8)	
Single	10 (20)	23 (8)	12 (27)	36 (18)	
Widowed	2 (4)	27 (10)	1 (2)	13 (6)	
Children, number, mean	1.8	2.0	2.0	2.2	
Level of education, number (%)					
Primary school	13 (27)	84 (30)	11 (25)	79 (39)	
Secondary school	12 (24)	91 (42)	23 (52)	82 (40)	
University	24 (49)	78 (28)	10 (23)	40 (20)	

Employment status, number (%)						
Employed	29 (59)	161 (58)	25 (60)	130 (64)		
On sick leave	4 (8)	12 (4)	8 (19)	17 (8)		
Unemployed	3 (6)	11 (4)	4 (10)	5 (2)		
Retired	7 (14)	79 (29)	0 (0)	43 (21)		
Other (housewife, maternity leave, studies)	6 (12)	14 (8)	5 (12)	8 (4)		
Born in Sweden, number (%)	44 (88)	258 (92)	38 (86)	186 (91)		
Place of childhood						
Countryside	16 (32)	113 (40)	10 (23)	74 (36)		
Small town	10 (20)	66 (23)	11 (25)	48 (24)		
City	24 (48)	102 (36)	23 (52)	81 (40)		
Estrogen therapy						
None	38 (79)	196 (75)	12 (28)	69 (34)		
Systemic	7 (15)	44 (17)	31 (72)	108 (53)		
Topical, vaginal	3 (6)	23 (9)	0 (0)	26 (16)		
Treatment						
Surgery alone			15 (34)	77 (38)		
Surgery and intracavitary radiotherapy			9 (20)	46 (23)		
Surgery and external radiotherapy			5 (11)	19 (9)		
Surgery, and intracavitary and external radiotherapy			15 (34)	39 (19)		
Radiotherapy alone			0 (0)	20 (10)		
Not indicated (5 not indicating treatment, 6 not indicating abused or not)			Total 11			

\*The same person appears in all three prevalence-categories.

The numbers in each category may vary due to internal missing information.

**TABLE 2.** Symptoms and Conditions: Relative Risk for Women with a History of Sexual Abuse Compared to Women without a History of Sexual Abuse

Aspect assessed	Control women		Women with a history of cervical cancer	
	Sexual abuse	No sexual abuse	Sexual abuse	No sexual abuse
Not or only a little satisfied with current sex-life	15/48 (31%)	66/268 (25%)	20/44 (45%)	52/186 (28%)
RR cervical cancer and sexual abuse vs. no sexual abuse			1.6 (1.1–2.4)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	1.3 (0.8–2.0)	1.0 (ref.)	1.8 (1.3–2.7)	1.1 (0.8–1.6)
Moderate or much distress if current sexual problems persists	17/34 (50%)	41/135 (30%)	20/31 (65%)	42/105 (40%)
RR cervical cancer and sexual abuse vs. no sexual abuse			1.6 (1.1–2.3)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	1.6 (1.1–2.5)	1.0 (ref.)	2.1 (1.5–3.1)	1.3 (0.9–1.9)
Moderate or much affect on well-being by current sexual problems	14/36 (39%)	27/154 (18%)	14/32 (44%)	28/123 (23%)
RR cervical cancer and sexual abuse vs. no sexual abuse			1.9 (1.2–3.2)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	2.2 (1.3–3.8)	1.0 (ref.)	2.5 (1.5–4.2)	1.3 (0.8–2.1)
Superficial dyspareunia in previous 6 months, moderate or much	3/39 (8%)	2/205 (1%)	12/41 (29%)	18/152 (12%)
RR cervical cancer and sexual abuse vs. no sexual abuse			2.5 (1.3–4.7)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	7.9 (1.4–45.6)	1.0 (ref.)	30.0 (7.0–129)	12.1 (2.9–51.5)
Deep dyspareunia in previous 6 months, moderate or much	4/40 (10%)	2/201 (1%)	6/40 (15%)	17/154 (11%)
RR cervical cancer and sexual abuse vs. no sexual abuse			1.4 (0.6–3.2)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	10.0 (1.9–53.0)	1.0 (ref.)	15.1 (3.2–72.0)	11.1 (2.6–47.3)
Moderate or much distress if dyspareunia persists	15/23 (65%)	20/65 (31%)	19/29 (66%)	37/83 (45%)
RR cervical cancer and sexual abuse vs. no sexual abuse			1.5 (1.0–2.1)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	2.1 (1.3–3.4)	1.0 (ref.)	2.1 (1.4–3.3)	1.4 (0.9–2.2)

Vaginal lubrication less than every other time when sexually aroused	4/38 (10%)	30/205 (15%)	12/36 (33%)	36/142 (25%)
RR cervical cancer and sexual abuse vs. no sexual abuse			1.3 (0.8–2.3)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	0.7 (0.2–1.8)	1.0 (ref.)	2.3 (1.3–4.0)	1.7 (1.1–2.7)
Vaginal lubrication moderately or very insufficient at intercourse	4/39 (10%)	23/204 (11%)	8/35 (23%)	37/140 (26%)
RR cervical cancer and sexual abuse vs. no sexual abuse			0.9 (0.4–1.7)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	0.9 (0.3–2.5)	1.0 (ref.)	2.0 (1.0–4.2)	2.3 (1.5–3.8)
Moderate or much distress if reduced lubrication persists	9/16 (56%)	33/93 (36%)	15/26 (58%)	50/97 (52%)
RR cervical cancer and sexual abuse vs. no sexual abuse			1.1 (0.8–1.6)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	1.6 (1.0–2.6)	1.0 (ref.)	1.6 (1.1–2.5)	1.5 (1.0–2.0)
Genital swelling less than every other time when sexually aroused	7/41 (17%)	52/200 (26%)	13/33 (39%)	47/136 (35%)
RR cervical cancer and sexual abuse vs. no sexual abuse			1.1 (0.7–1.8)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	0.7 (0.3–1.3)	1.0 (ref.)	1.5 (0.9–2.5)	1.3 (1.0–1.8)
Moderate or much distress if reduced genital swelling persists	8/17 (47%)	19/84 (23%)	8/14 (57%)	39/78 (50%)
RR cervical cancer and sexual abuse vs. no sexual abuse			1.1 (0.7–1.9)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	2.1 (1.1–3.9)	1.0 (ref.)	2.5 (1.4–4.6)	2.2 (1.4–3.5)
Vaginal length reduced, moderate or much	4/37 (11%)	3/199 (2%)	14/39 (36%)	38/156 (24%)
RR cervical cancer and/or sexual abuse vs. neither			1.5 (0.9–2.4)	1.0 (ref.)
RR cervical cancer and sexual abuse vs. no sexual abuse	7.2 (1.7–30.7)	1.0 (ref.)	23.8 (7.2–79.0)	16.2 (5.1–51.4)
RR cervical cancer and/or sexual abuse vs. neither	2/39 (5%)	7/203 (3%)	12/40 (30%)	33/153 (22%)
Vaginal elasticity reduced, moderate or much			1.4 (0.8–2.4)	1.0 (ref.)
RR cervical cancer and sexual abuse vs. no sexual abuse	1.5 (0.3–6.9)	1.0 (ref.)	8.7 (3.7–20.7)	6.3 (2.8–13.8)
RR cervical cancer and/or sexual abuse vs. neither	17/27 (63%)	34/113 (30%)	22/33 (67%)	52/98 (53%)
Moderate or much distress if current problems with intercourse persists			1.3 (0.9–1.7)	1.0 (ref.)
RR cervical cancer and sexual abuse vs. no sexual abuse			2.2 (1.5–3.2)	1.8 (1.3–2.5)
RR cervical cancer and/or sexual abuse vs. neither	2.1 (1.4–3.1)	1.0 (ref.)		

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**TABLE 2.** Symptoms and Conditions: Relative Risk for Women with a History of Sexual Abuse Compared to Women Without a History of Sexual Abuse (*Continued*)

Aspect assessed	Control women		Women with a history of cervical cancer	
	Sexual abuse	No sexual abuse	Sexual abuse	No sexual abuse
Frequency of intercourse less than twice per month in previous 6 months	33/49 (67%)	155/274 (57%)	26/44 (59%)	130/201 (65%)
RR cervical cancer and sexual abuse vs. no sexual abuse			0.9 (0.7–1.2)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	1.2 (1.0–1.5)	1.0 (ref.)	1.0 (0.8–1.4)	1.1 (1.0–1.3)
Frequency of intercourse less than twice per month 5 years ago	18/49 (37%)	113/275 (41%)	15/44 (34%)	75/200 (38%)
RR cervical cancer and sexual abuse vs. no sexual abuse			0.9 (0.6–1.4)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	0.9 (0.6–1.2)	1.0 (ref.)	0.8 (0.5–1.3)	0.9 (0.7–1.1)
Orgasm less than twice per month	23/40 (58%)	99/206 (48%)	16/37 (43%)	81/138 (59%)
RR cervical cancer and sexual abuse vs. no sexual abuse			0.7 (0.5–1.1)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	1.2 (0.9–1.6)	1.0 (ref.)	0.9 (0.6–1.3)	1.2 (1.0–1.5)
Sex is not or only a little important	20/49 (43%)	111/278 (40%)	13/43 (30%)	84/198 (40%)
RR cervical cancer and sexual abuse vs. no sexual abuse			0.7 (0.4–1.2)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	1.0 (0.7–1.5)	1.0 (ref.)	0.8 (0.5–1.2)	1.1 (0.9–1.3)
Sexual desire less frequently than once per month	23/50 (46%)	189/277 (68%)	19/44 (43%)	136/200 (68%)
RR cervical cancer and sexual abuse vs. no sexual abuse			0.6 (0.4–0.9)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	0.7 (0.5–0.9)	1.0 (ref.)	0.6 (0.4–0.9)	1.0 (0.9–1.1)
Sexual desire at least once per week	16/50 (32%)	52/277 (19%)	19/44 (43%)	39/200 (20%)
RR cervical cancer and sexual abuse vs. no sexual abuse			2.2 (1.4–3.4)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	1.7 (1.1–2.7)	1.0 (ref.)	2.3 (1.5–3.5)	1.0 (0.7–1.5)
Sexual arousal in less than half of sexual situations	6/40 (15%)	33/203 (16%)	8/33 (24%)	34/142 (24%)
RR cervical cancer and sexual abuse vs. no sexual abuse			1.0 (0.5–2.0)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	0.9 (0.4–2.1)	1.0 (ref.)	1.5 (0.8–2.9)	1.5 (1.0–2.3)

dyspareunia because of sexual abuse were found after we stratified for mode of cancer treatment, estrogen therapy, marital status, parity and education (Table 3). However, tests for homogeneity between strata yielded *p*-values above 0.05 for all these factors.

Impaired lubrication and genital swelling at sexual arousal and intercourse were similar among abused and nonabused women (Table 2). Women with a history of cervical cancer had these symptoms more often than did controls (Bergmark, Åvall-Lundqvist, Dickman, Henningsohn, & Steineck, 1999), regardless of history of abuse. The frequencies of intercourse, orgasms, and reported arousal in sexual situations were similar among abused and nonabused women, irrespective of history of cervical cancer. The perceived length of the vagina (at intercourse) was substantially negatively affected by a history of cervical cancer (Bergmark et al., 1999), for abused women, 36% and nonabused women 24%. Although this symptom was very rare (2%) among nonabused controls, it was reported by 11% of the abused controls; however, the numbers are small.

Furthermore, patients with a history of sexual abuse reported a higher sense of loss of the uterus after surgery, a slightly more severe impact of the treatment-induced infertility, and more distress at the prospect of finding a new partner (Table 4). The satisfaction with their partner as a friend was similar between the abused and nonabused women, but more abused women were dissatisfied with their partner as a lover. Single women were overrepresented among the abused women (Table 1). Women with a history of sexual abuse and cervical cancer especially reported a sense of reduced femininity during the past 5 years (Table 4).

Women with a history of cervical cancer but without a history of sexual abuse had the same level of anxiety, depression, psychological well-being, energy, and physical well-being as controls without a history of sexual abuse (Table 5). Women with a history of sexual abuse, irrespective of history of cervical cancer, had a higher frequency of most of these outcomes than did women without such a history.

The women with a history of cervical cancer and sexual abuse generally were less willing to trade off maximal survival to forgo parts of the treatment (Table 6). This also was true for the intracavitary radiotherapy. The tendency was stronger among women with severe or moderate sexual abuse.

## DISCUSSION

Sexual abuse and cervical cancer may interact in causing sexual dysfunction and decreased well-being. We found that sexual abuse and cervical cancer both were independent risk factors for superficial dyspareunia, and the relative risk was very high (30.0) when both factors were combined. When women had been subjected to severe abuse, they were not willing to trade off

**TABLE 3.** Superficial Dyspareunia, Moderate or Much, Among Women with a History of Cervical Cancer, Controlled for Effect-Modifying Variables. Proportion (Percentages), and Relative Risks (with 95% Confidence Intervals) for Abused vs. Non-Abused Women. Only Sexually Active Women Included in Analysis

	Abused	Non-abused	Abused	Non-abused	Abused	Non-abused	Abused	Non-abused
Treatment			Intracavitary radiotherapy and surgery		Surgery and external radiotherapy		Surgery, intracavitary and external radiotherapy	
Proportion	2/14 (14)	5/64 (16)	3/8 (38)	6/37 (16)	3/5 (60)	3/10 (30)	4/14 (29)	2/31 (6)
Relative risk	1.8 (0.4–8.5)		2.3 (0.7–7.3)		2.0 (0.6–6.6)		4.4 (0.9–21.4)	—
Estrogen		No estrogen	Systemic estrogen		Topical estrogen			
Proportion	3/10 (30)	2/45 (4)	9/31 (29)	12/91 (13)	0/0 (0)	4/15 (27)		
Relative risk	6.8 (1.3–35.2)		2.2 (1.0–4.7)		—			
Marital status		Married or cohabiting	Have a relationship, but lives alone		Single, widow			
Proportion	8/23 (35)	11/119 (9)	0/6 (0)	3/16 (19)	4/12 (33)	4/16 (25)		
Relative risk	3.8 (1.7–8.3)		—		1.3 (0.4–4.3)			
Parity		No children	One or more children					
Proportion	3/5 (60)	4/18 (22)	9/36 (25)	14/133 (11)				
Relative risk	2.7 (0.9–8.3)		2.4 (1.1–5.0)					
Education		Primary school	Secondary school		University			
Proportion	2/9 (22)	9/50 (18)	8/23 (35)	5/65 (8)	2/9 (22)	3/33 (9)		
Relative risk	1.2 (0.3–4.8)		2.9 (1.1–8.4)		2.4 (0.5–12.5)			

**TABLE 4.** Partner Relationship, Infertility, Self-Esteem, Femininity and Other Problems

Aspect assessed	Control women		Women with a history of cervical cancer	
	Sexual abuse	No sexual abuse	Sexual abuse	No sexual abuse
Little or no satisfaction with partner as friend	3/38 (8%)	11/222 (5%)	2/32 (6%)	12/158 (8%)
RR cervical cancer and sexual abuse vs. no sexual abuse			0.8 (0.2-3.5)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	1.6 (0.5-5.4)	1.0 (ref.)	1.3 (0.2-5.4)	1.5 (0.7-3.4)
Little or no satisfaction with partner as lover	8/37 (22%)	22/200 (11%)	5/30 (17%)	13/138 (9%)
RR cervical cancer and sexual abuse vs. no sexual abuse			1.8 (0.7-4.6)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	2.0 (0.9-4.1)	1.0 (ref.)	1.5 (0.6-3.7)	0.9 (0.4-1.6)
Feel moderate or much distress at the prospect of finding new partner	Not asked for		14/16 (88%)	11/28 (39%)
RR cervical cancer and sexual abuse vs. no sexual abuse			2.2 (1.3-3.7)	1.0 (ref.)
Feel less feminine in last 5 years	13/47 (27%)	47/273 (17%)	21/44 (48%)	40/197 (20%)
RR cervical cancer and sexual abuse vs. no sexual abuse			2.4 (1.6-3.6)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	1.5 (0.9-2.6)	1.0 (ref.)	2.8 (1.9-4.2)	1.2 (0.8-1.7)
Lowered self-esteem in last 5 years	Not asked for		20/35 (57%)	45/82 (55%)
RR cervical cancer and sexual abuse vs. no sexual abuse			1.0 (0.7-1.5)	1.0 (ref.)
Miss having uterus moderate or much	Not asked for		12/44 (27%)	27/183 (15%)
RR cervical cancer and sexual abuse vs. no sexual abuse			1.8 (1.0-3.4)	1.0 (ref.)
Distress owing to infertility, moderate or much	Not asked for		14/34 (41%)	34/104 (33%)
RR cervical cancer and sexual abuse vs. no sexual abuse			1.3 (0.8-2.0)	1.0 (ref.)

**TABLE 5.** Worst Extremes of Well-Being, Level of Energy, Depression and Anxiety in Women Five Years after Therapy for Cervical Cancer and in Controls. Sexual Abuse or Not

Aspect assessed	Control women		Women with a history of cervical cancer	
	Sexual abuse	No sexual abuse	Sexual abuse	No sexual abuse
Low psychological well-being (1-2/7)	8/49 (16%)	19/279 (7%)	7/44 (16%)	12/201 (6%)
RR sexual abuse vs. no sexual abuse			2.7 (1.1-6.4)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	2.4 (1.1-5.2)	1.0 (ref.)	2.3 (1.0-5.2)	0.9 (0.4-1.8)
High level of anxiety (6-7/7)	5/50 (10%)	20/279 (7%)	4/44 (9%)	12/197 (6%)
RR sexual abuse vs. no sexual abuse			1.5 (0.5-4.4)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	1.4 (0.5-3.5)	1.0 (ref.)	1.3 (0.5-3.5)	0.8 (0.4-1.7)
High level of depression (6-7/7)	5/50 (10%)	24/280 (9%)	7/44 (16%)	17/199 (9%)
RR sexual abuse vs. no sexual abuse			1.9 (0.8-4.2)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	1.2 (0.5-2.9)	1.0 (ref.)	1.9 (0.9-4.0)	1.0 (0.6-1.8)
Low energy level (1-2/7)	4/50 (8%)	24/279 (9%)	7/44 (16%)	17/201 (8%)
RR sexual abuse vs. no sexual abuse			1.9 (0.8-4.3)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	0.9 (0.3-2.6)	1.0 (ref.)	1.8 (0.8-4.0)	1.0 (0.5-1.8)
Low physical well-being (1-2/7)	6/50 (12%)	19/278 (7%)	3/44 (7%)	12/201 (6%)
RR sexual abuse vs. no sexual abuse			1.1 (0.3-3.9)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	1.8 (0.7-4.2)	1.0 (ref.)	1.0 (0.3-3.2)	0.9 (0.4-1.8)

**TABLE 6.** Anxiety, Depression, and Well-Being: Values above the 90th percentile, Generic Scales, Proportion and Percentage. Abused and Non-Abused Women

Scale	Control women			Women with a history of cervical cancer		
	Sexual abuse (any degree)	Severe or moderate sexual abuse	No sexual abuse	Sexual abuse (any degree)	Severe or moderate sexual abuse	No sexual abuse
STAI-T(anxiety) above 90th percentile <sup>#</sup>	8/50 (16%)	4/21 (19%)	23/268 (9%)	5/44 (11%)	1/21 (5%)	21/195 (11%)
RR sexual abuse vs. no sexual abuse				1.1 (0.4-2.6)	0.4 (0.1-2.9)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	1.9 (0.9-3.9)	2.1 (0.8-5.4)	1.0 (ref.)	1.3 (0.5-3.3)	0.5 (0.1-3.7)	1.3 (0.7-2.2)
CES-D (depression) above 90th percentile <sup>#</sup>	5/50 (10%)	2/21 (10%)	20/259 (8%)	5/44 (11%)	1/21 (5%)	24/189 (13%)
RR sexual abuse vs. no sexual abuse				0.9 (0.4-2.2)	0.4 (0.1-2.5)	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	1.3 (0.5-3.3)	1.2 (0.3-4.7)	1.0 (ref.)	1.5 (0.6-3.7)	0.6 (0.1-4.2)	1.6 (0.9-2.9)
GQL (well-being) above 90th percentile <sup>†</sup>	2/50 (4%)	0/21 (0%)	28/275 (10%)	3/44 (7%)	0/21 (0%)	21/194 (11%)
RR sexual abuse vs. no sexual abuse				0.6 (0.2-2.0)	—	1.0 (ref.)
RR cervical cancer and/or sexual abuse vs. neither	0.4 (0.1-1.6)	—	1.0 (ref.)	0.7 (0.2-2.1)	—	1.1 (0.6-1.8)

RR = Relative risk.

<sup>#</sup>Above 90th percentile being those most anxious and depressed, respectively.

<sup>†</sup>Above 90th percentile being those with best well-being.

**TABLE 7.** Trade Off: Proportion of Women with a History of Cervical Cancer with or without a History of Sexual Abuse Willing to Consider to Trade Off Maximal Survival to Forgo Parts of the Given Treatment (Even 1% Risk of Diminished Survival)

Treatment hypothetically forgone	Surgery (n=214)	Intracavitary radiotherapy (n=115)	External radiotherapy (n=87)
All women with a history of cervical cancer, irrespective of sexual abuse or not	22/214 (10%)	23/115 (20%)	14/87 (16%)
Women with a history of cervical cancer, no sexual abuse	17/171 (10%)	20/93 (22%)	11/67 (16%)
Women with a history of cervical cancer, any history of sexual abuse*	5/43 (12%)	3/22 (14%)	3/20 (15%)
Treated with surgery alone	3/15 (20%)	Not applicable	Not applicable
Treated with surgery and intracavitary radiotherapy	0/9 (0%)	0/9 (0%)	Not applicable
Treated with surgery and external radiotherapy	1/5 (20%)	Not applicable	0/5 (0%)
Treated with surgery, intracavitary and external radiotherapy	1/14 (7%)	3/13 (23%)	3/15 (20%)
Women with a history of cervical cancer, severe or moderate sexual abuse*	3/20 (15%)	0/10 (0%)	0/9 (0%)
Treated with surgery alone	2/6 (33%)	Not applicable	Not applicable
Treated with surgery and intracavitary radiotherapy	0/6 (0%)	0/6 (0%)	Not applicable
Treated with surgery and external radiotherapy	1/3 (33%)	Not applicable	0/6 (0%)
Treated with surgery, intracavitary and external radiotherapy	0/5 (0%)	0/4 (0%)	0/3 (0%)

\*The same women may appear in both categories (“any” and “severe and moderate”).

optimal survival for freedom from treatment-induced symptoms. In the investigated population of former cervical cancer patients, 18% reported a history of sexual abuse, 8% of which had been moderately or severely abused.

A large percentage (29%) of the women having a history of both sexual abuse and cervical cancer had dyspareunia, compared with 1% of those with neither factor. Among controls, the risk was increased 8-fold. We do not know if the cervical cancer reactivates the psychological trauma. We did not ask specific questions, such as if the disease reminded the woman of past sexual abuse. Individual abused women added comments spontaneously in the questionnaires and reported a sense of repeated violation at the examinations or treatment with intracavitary radiotherapy.

The expected marked distress from dyspareunia was noticeably reduced if there was no history of sexual abuse. Women with a history of sexual abuse are reported to have a high frequency of localized vulvar dysesthesia (Brotto, Basson, & Gehring, 2003; Danielsson, Eisemann, Sjöberg, & Wikman, 2001), and it is possible that this also is an important factor in the development of dyspareunia in women with a history of cervical cancer and past sexual abuse.

There was no difference in reported insufficient lubrication between the women with a history of cervical cancer, whether they had a history of sexual abuse or not. However, it was significantly reduced compared with women with no history of cervical cancer, regardless of their history of sexual abuse. Part of the reduced lubrication might be attributable to autonomic nerve damage during radical hysterectomy, leading to reduced or inhibited genital vasocongestion and affected autonomic neural circuits. Nerve-sparing radical hysterectomy is now being developed and is anticipated to give a better long-term situation regarding vaginal, bladder, and rectal function (Trimbos, Maas, Deruiter, Peters, & Kenter, 2001). No woman in our study was treated with nerve-sparing hysterectomy.

We found that previous sexual abuse gives rise to a life-long decreased level of well-being. Possibly a feeling of guilt or shame persists that interferes with the possibilities of enjoying life. The impact of sexual abuse probably depends on the degree and frequency of abuse, the victim's age at abuse, and the degree of emotional strain that the sexual abuse involved dependence on the violator (Bendixen, Muus, & Schei, 1994; Greenwald et al., 1990; Springs et al., 1992). Sexually abused women report significantly more medical problems, higher levels of somatization of psychological symptoms and a higher prevalence of health risks (Hexel & Sonneck, 2002; Springs & Friedrich, 1992; Young & Katz, 1998). Swedish (Wijma & Wijma, 1993) and international studies (Golding, Wilsnack, & Learman, 1998; Kirkengen, Schei, & Steine, 1993; Kinzl, Traweger, & Biebl, 1995) indicate that women with a history of sexual assault are overrepresented among women with gynecological complaints (dysmenorrhoea, menorrhagia, low sexual desire, and sexual dysfunction). Springs and Friedrichs found that fewer than 2% of the 113 sexually abused

women in their study had discussed the abuse with a physician (Springs & Friedrich, 1992).

Even though abused women with a history of cervical cancer experience more dyspareunia, they did not more frequently report insufficient lubrication, genital swelling, or reduced frequency of desire, intercourse or orgasms. Yet, the abused women were highly distressed by sexual dysfunction and reported that their "well-being was negatively affected by the dysfunction." A possible mechanism behind the discrepancy is a feeling of frustration between satisfaction with their current level of function and what they perceive to be possible or ideal, resulting in unfulfilled needs and unresolved problems. More previously abused women than others were single or dissatisfied with their current sexual partner.

No woman in our study with a history of cervical cancer and sexual abuse used topical estrogen, compared with 16% (26/203) of women with a history of cervical cancer not reporting prior sexual abuse. We have no explanation for this difference; no information was collected on, for example, whether sexually abused women have a changed "relation" to their genital organs or whether this influences the tendency to apply estrogen vaginally. Topical application of estrogen is an established treatment for urogenital atrophy in the menopause, and it has been suggested that topical estrogen is more efficient than systemic estrogen for maintaining or restoring vaginal epithelial function after radiotherapy (Pitkin & Bradbury, 1965).

Women with a history of sexual abuse were given adjuvant external radiotherapy more often than others (45% vs. 32%). This could be an additional indication of how women with a history of sexual abuse fare poorly in relation to a diagnosis of cervical cancer. Adjuvant radiotherapy is added to surgery in conformity with the rationale that survival and local control may be increased in patients with high-risk disease lymph node metastasis, close or positive surgical margins, large tumours, disfavorable histological type (Thomas & Dembo, 1991). One explanation for our data is that among women with stage IB-IIA cervical cancer, sexually abused women are diagnosed with the disease later than others, or, on an average, contract a disease with signs of a high malignancy potential. Springs and Friedrich (1992) demonstrated that abused women attend screening programs less often than do others resulting in a negative lead-time. Some reasons for this may be acquired hopelessness, self-neglect, self-destructive behavior, or fear of gynecological examinations (Harsanyi et al., 2003; Robohm & Bottenheim, 1996).

Our data indicate that sexual abuse increases the risk of contracting cervical cancer. The development of cervical cancer is associated with human papillomavirus (HPV; Franco, Rohan, & Villa, 1999; McCance & Singer, 1986) and thus with sexual behavior. Men who place their sexual partners at increased risk of cervical cancer have an above-average number of sexual partners and exhibit an above-average risk-taking behavior (Agarwal, Sehgal,

Sardana, Kumar, & Luthra, 1993; Bosch et al., 1996; Thomas et al., 1996). Early exposure to HPV may increase the actual risk of cervical cancer (Brinton et al., 1987; Franceschi, La Vecchia, & Decarli, 1986; Gutman et al., 1994; Moscicki, 1996). A further mechanism could be that early sexual abuse predisposes one to have multiple sexual partners (Riggs et al., 1990) and an accumulated increased risk of sexually transmitted HPV infection (Franceschi et al., 1986), possibly exacerbated by other risk factors such as smoking (Daling et al., 1996; Ylitalo et al., 1999) and other genital infections (Brinton et al., 1987; Brisson, Roy, Fortier, Bouchard, & Meisels, 1988; Daling et al., 1996).

Despite the decreased well-being and the more-severe impact of symptoms reported by women with a history of sexual abuse, they were not more willing to trade off maximal survival to diminish the treatment-induced symptoms. In other words, our data do not support the view that supposed self-destructive behavior after sexual abuse leads to different trade-off decisions, at least not among sexually abused cervical cancer survivors. If anything, our results show the opposite attitude.

Our study is observational in nature, and we addressed a number of validity issues during its design and analysis to compensate for the absence of randomization and blinding (Steineck, Kass, & Ahlbom, 1998). The population-based setting, based on our nearly complete computerized population registers in Sweden, diminishes problems with selection. The questionnaires were answered anonymously (also for us) at home, which makes for honest answers and mimics "blinding" (no investigator-related bias). Several preparatory studies and experiences from previous investigations lessened problems with nonparticipation. We considered using questionnaires developed by others but found that they would not give us detailed enough information for female sexual dysfunction, for example, occurrence of insufficient lubrication or dyspareunia. A large number of potential confounders were measured and adjusted for, but we found no indication that extraneous factors explain the reported associations. Women who are maladjusted after a prior sexual abuse may refrain participation. If so, the estimated prevalence of prior sexual abuse is underestimated, and the reported relative risks concerning dyspareunia and other outcomes that may be related to maladjustment are too low. Recall bias is an issue when we assess the risk of cervical cancer after sexual abuse. By the term *synergy* we mean a deviation from additivity of excess risks, as defined by, e.g., Rothman & Greenland (1998).

Thus, sexual abuse gives life-long complications. For women experiencing psychological symptoms or sexual dysfunction, identifying this part of the anamnesis may assist in finding a remedy. Also, after women contract cervical cancer, our findings emphasize the need for an open dialogue about the past trauma, which may be beneficial for the prevention of further treatment-related symptoms. Of course, sexual abuse is an unacceptable crime that should be prevented. An increased knowledge in society of the life-long effects of the trauma may enhance such efforts and, in addition,

help women with a history of sexual abuse to understand and cope with present problems.

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