

# Evaluation of anxiety levels during intracavitary brachytherapy applications in women with gynecological malignancies

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## Summary

**Purpose:** To evaluate the anxiety levels of women treated for gynecological malignancies using intracavitary brachytherapy.

**Methods:** Anxiety levels prior to and after intracavitary brachytherapy application and factors influencing anxiety levels were evaluated. Women were evaluated for quality of life and psychological status before each brachytherapy application using the Hospital Anxiety and Depression Scale (HADS). Scores were grouped as follows: 0-7 = normal, 8-10 = borderline, 11-21 = abnormal. Women were also questioned about other factors which could affect anxiety levels such as marital status, education level, number of pregnancies and prior surgical history.

**Results:** Between January 2003 and August 2004, 146 women with a median age of 56 years were evaluated (range: 27-80). Eighty-six women had cervix uteri carcinoma and 63 had endometrial carcinoma. Sixty-seven women were premenopausal and 85 women were postmenopausal. The median pregnancy number was three (range = 0-10). Eighty-nine women had at least three children. Sixty-seven women had had previous operations. One hundred and twenty-five women were married and 24 women were unmarried or widowed. Before treatment, the anxiety scores were scored as normal in 49 (32%), borderline in 41 (28%), and abnormal in 59 (40%). Anxiety levels were lower in 69 women during the last application as compared with the pretreatment levels ( $p = 0.00$ ). Marital status and pregnancy number showed a significant correlation with anxiety scores ( $p = 0.04$ ). Age, level of education or having had a previous operation showed no significant correlation with anxiety level.

**Conclusion:** These results indicate that intracavitary brachytherapy is associated with anxiety. Women need to be given detailed information before the brachytherapy application to reduce anxiety. Additional studies are needed to determine it.

**Key words:** Brachytherapy; Anxiety; Gynecologic cancer.

## Introduction

Anxiety is frequently encountered in patients with cancer and can affect both the quality of life and the treatment delivery [1, 2]. Particularly at the beginning of radiotherapy, cancer patients can experience tension, anxiety and feelings of helplessness [3, 4]. Radiotherapy (RT) plays an important role in the treatment of women with gynecological malignancies. This treatment involves a combination of external beam irradiation followed by intracavitary RT. High-dose rate intracavitary brachytherapy (ICB-HDR) has been used widely in Asia, Europe and North America [5]. Brachytherapy is an effective modality because placement of the source of radiation close to or inside the tumor results in a high target dose and relative sparing of the bladder, rectum, and small bowel. ICB-HDR with central vaginal cylinders are conventionally employed to deliver a very high dose to the cervix and vagina with only a minimal dose to the rectum and bladder. The treatment achieves a high cure rate with an acceptable morbidity. However it is viewed as a surgical procedure and patients may exhibit higher pretreatment anxiety.

The Hospital Anxiety and Depression Scale (HADS) is a well accepted instrument used in physically ill patients and in some population settings because it has only 14 items and can be used as a bidimensional scale for namely, anxiety and depression [6]. The HADS has been recommended for use in oncology [2, 7, 8]. In 1997, Aass *et al.* reported a prevalence of 9% of cases of depression and 13% of cases of anxiety among unselected cancer patients using the HADS [2].

The principal aim of this study was to evaluate the level of anxiety in women treated with ICB-HDR. The secondary end point was to define influencing factors for anxiety in women undergoing intracavitary brachytherapy procedures.

## Material and Methods

This study was performed under the control of the Ethics Committee of Ege University School of Medicine. Between January 2003 and August 2004, 151 women with gynecological malignancies were treated with HDR intracavitary brachytherapy (HDR-ICB) at Ege University Medical School Department of Radiation Oncology and 149 of these 151 patients were accrued for this trial. Two women decided not to participate and did not complete the questionnaires. The women were evaluated before treatment using the HADS, after translation of this scale to the Turkish language [9]. Questionnaires were answered before each application and scores were collected. At the end of the procedure, a final question was asked regarding the personal experience of the women.

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Table 1. — Hospital anxiety and depression Scale - seven questions for anxiety evaluation.

	score
1. I feel tense and "wound up"	
– most of the time	3
– a lot of the time	2
– from time to time, occasionally	1
– not at all	0
2. I get a sort of frightened feeling like "butterflies in the stomach"	
– Not at all	0
– Occasionally	1
– Quite often	2
– Very often	
3. I get a sort of frightened feeling like something awful is about to happen	
– Not at all	0
– A little, but it doesn't worry me	1
– Yes, but not too badly	2
– Very definitely and quite badly	3
4. I feel restless as if I have to be on the move	
– Very much indeed	3
– Quite a lot	2
– Not very much	1
– Not at all	0
5. Worrying thoughts go through my mind	
– A great deal of the time	3
– A lot of the time	2
– From time to time but not often	1
– Only occasionally	0
6. I get sudden feelings of panic	
– Very often	3
– Quite often	2
– Not very often	1
– Not at all	0
7. I can sit at ease and feel relaxed	
– Not at all	3
– Not often	2
– Usually	1
– Definitely	0

The HADS was used to assess the current levels of anxiety. Each scale consists of seven items to be answered on a 4-point scale (Table 1). The HADS is a short, self-assessment form used to analyze the psychological variables anxiety and depression in somatic medicine. The anxiety scale of the HADS form is designed to describe psychological manifestations of anxiety neuroses exclusively. The information compiled deals predominantly with generalized anxiety symptomatology. The scores were grouped as follows: 0-7 = normal, 8-10 = borderline, 11-21 = abnormal. The women were also questioned about factors which could affect anxiety levels such as marital status, educational level, number of pregnancies and prior surgery.

#### Radiotherapy

External irradiation was given with 6 MV linac. Anteroposterior fields or the pelvic box technique was used depending on the body thickness of the women. External irradiation was 50-54 Gy to the midline, with daily doses of 1.8 Gy. The median total dose was 54 Gy in operated women and 59.4 Gy in non-operated women (with a parametrial boost after 54 Gy). Brachytherapy was administered using a tandem and two shielded ovoids for non-operated women and only two shielded ovoids for operated women with the standard Nucletron appli-

cator set (Nucletron Corporation, Veenendaal, Netherlands). Orthogonal radiographs of each application were digitized and treatment planning was conducted using The Nucletron Plato version BPS 2.0 (Nucletron Corporation, Veenendaal, Netherlands). Three fractions of -6 Gy or two fractions of 6.5 Gy were given to a depth of 5-9 mm from the vaginal surface in operated patients, and five fractions of -5 Gy or three fractions of -6 Gy were applied to point A in inoperable patients.

ICB-HDR was performed using Ir192 sources. The source arrangement, irradiation conditions and dose distributions were based on the Manchester system. Point A was defined on the X-rays as being 2 cm superior to the external os and 2 cm lateral from the axis of the intrauterine tandem. ICB-HDR was performed using one fraction per week. Before each application, patients were informed about the brachytherapy procedures by a specialized nurse and primary care physician.

#### Statistical analysis

Data were analyzed by the SPSS program for PC version 11.0 (SPSS Inc., Chicago IL), using standard descriptive measures. Associations between continuous variables were assessed by Pearson's correlation coefficient. Means were compared by the Student's t test and analysis of variance and distributions of categorical variables were compared by the chi-square test. The significance level was set at  $p < 0.05$  and all significance tests were two-sided.

#### Results

The characteristics of these women are listed in Table 2. Of the 149 women studied 63 (42%) had endometrial carcinoma and 86 (58%) had cervical carcinoma. Median age was 56 (range = 27-80). Eighty women (54%) had squamous carcinoma and 61 women had adenocarcinoma with histological confirmation. One hundred and twenty-five women (84%) were married, five (3%) were unmarried and 19 patients (13%) were widowed. Fifty-two (35%) women had a low education level (no reading or writing ability) and 97 (65%) women had an intermedi-

Table 2. — Patients characteristics.

		Number	%
Age	Median 56 (27-80)		
Primary tumor	Endometrial cancer	63	42.3
	Cervical cancer	86	57.7
Histopathology	Squamous cell cancer	80	53.7
	Adenocarcinoma	61	40.9
	Other	8	5.5
Operation	Operated on	82	55
	Not operated on	67	45
Marital Status	Married	125	83.9
	Unmarried	5	3.4
	Widowed	19	12.8
Menopausal status	Premenopausal	64	43
	Postmenopausal	85	57
Education level	None	51	34.2
	Elementary/Middle School	79	53
	High School	16	10.7
	University	3	2
Number of children	Median: 3 (range: 0-0)		
No. of pregnancies	0-2	60	40.3
	3 and more	89	59.7

ate or higher education level (only 3 women had a university degree). Sixty-seven women were premenopausal and 85 women were postmenopausal. The median pregnancy number was three (range = 0-10). Eighty-nine women (59%) had at least three children and 13 women (8.7%) had no children. Sixty-seven women were operated on and 72 women were classified as inoperable.

**Anxiety level**

At the beginning of the brachytherapy applications, the median anxiety level was 9 (range = 2-21). Fifty-two women (34.9%) were identified as having normal anxiety levels, 38 women (25.5%) were identified as having borderline anxiety levels and 59 women (39.61%) were identified as having abnormal anxiety levels. Before the last application, 110 patients (73.8%) were recorded as having normal anxiety levels, 25 patients (16.8%) as having borderline anxiety levels and 14 patients (9.4%) were recorded as having abnormal anxiety levels. The anxiety level was noted to be significantly lower compared with pretreatment levels ( $p < 0.05$ ) (Table 3).

Table 3. — Pretreatment and post-treatment anxiety levels.

	Before the first application		Before the last application	
	Number	%	Number	%
Normal anxiety level	52	34.9	110	73.8
Borderline anxiety level	38	25.5	25	16.8
Abnormal anxiety level	59	39.6	14	9.4

$p = 0.000$ .

Before the first application, married and widowed women showed lower anxiety level when compared with unmarried women ( $p < 0.05$ ). Women with none to two children showed higher anxiety levels compared with women with three or more children. Educational level, menopausal status, age, disease or prior operations were not affect anxiety levels at the beginning of the therapy (Table 4).

Table 4. — Factors affecting anxiety level.

Factor	Number	p value
<i>Marital status</i>		
Unmarried-widowed	24	$p = 0.04$
Married	125	
<i>No. of pregnancies</i>		
0-2	57	$p = 0.04$
3 or more	89	
<i>Age</i>		
≤ 55	72	$p = 0.29$
> 55	77	
<i>Menopausal status</i>		
Premenopausal	64	$p = 0.09$
Postmenopausal	85	
<i>Education level</i>		
Lower	130	$p = 0.14$
Higher	19	
<i>Surgery</i>		
Operated on	67	$p = 0.26$
Not operated on	79	

Before the last application, age, marital status, disease, parity number, menopausal status and operation had no effect on anxiety levels ( $p < 0.05$ ).

After treatment was completed, 122 women (82%) exhibited decreasing anxiety during the treatment period. Twenty-four women were recorded as having had high anxiety levels during the entire treatment period (Figure 1).

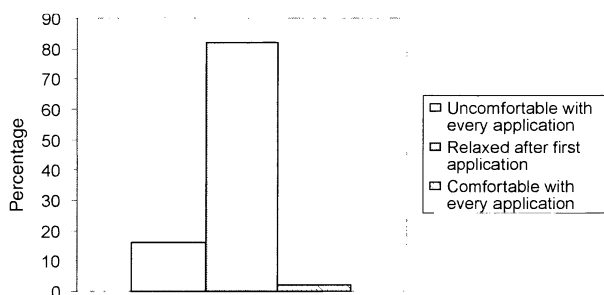


Figure 1. — Personal experience of the women.

**Discussion**

The combination of external beam radiotherapy and intracavitary brachytherapy is considered to be one of the standard treatments for carcinoma of the cervix and endometrium. Brachytherapy allows an extremely high dose of radiation to be received by the tumor, with relative sparing of the surrounding tissues from radiation-induced complications. The success of the cancer treatment depends not only on the medical therapy but also on how well the medical team is able to restore the patient's peace of mind. Anxiety and depression are important and common comorbidities in cancer and may affect survival [10]. It is very important that we establish how disease and treatment influence the way in which patients continue to survive physically and socially. This study evaluates anxiety before and after intracavitary brachytherapy in women with gynecological cancer.

To our knowledge, the present study represents the first attempt to investigate the relationship between the intracavitary brachytherapy and anxiety using the HADS in women with gynecological malignancies. In our trial, we experienced a high compliancy rate with the HADS. Reliability and validity of the HADS were similar to other reported trials in cancer patients [7, 11].

HADS levels have been reported for large groups of healthy subjects [12]. Median and mean anxiety levels have been reported in the range of 4-7 [13-17]. However, few studies have reported on anxiety levels of cancer patients before and after radiation therapy [18-22]. Geinitz and colleagues showed that a median anxiety level of 5 existed for women with breast cancer being treated by external beam radiation therapy [20]. The median level of the HADS was 6 for anxiety in patients with uveal melanoma treated with radiotherapy [22]. In the present trial the median anxiety level was 9 and higher than for the patients treated for breast cancer or other sites. Rollison *et al.* showed that 80% of women being treated by brachytherapy reported they experienced great anxiety before admission compared with a control group [18]. In our study,

65% of the patients demonstrated borderline or higher anxiety levels before the treatment using the HADS. The results of our study indicate that the clinical anxiety level is higher in women before brachytherapy and this result is consistent with those obtained by Rollison and *et al.* [18].

It is important to identify factors that can predict high anxiety levels before the treatment of cancer patients. Ford reported that patients without partners or regular family relationships had higher anxiety levels before and after cancer treatment [23]. In our study we found that widowed and unmarried women showed a higher anxiety level. We also observed that women with none to two children showed higher anxiety levels compared with women with more than two children. Social or marital status was one of the most important factors that affected anxiety levels in patients with cancer.

This study shows that, post-treatment anxiety levels were decreased significantly during the treatment as compared with pretreatment levels, regardless of patient characteristics. Brandt showed that a significantly lower level of anxiety was observed post implant compared with preimplant [24], emphasizing the importance of the informational needs of patients before brachytherapy. The increasing use of brachytherapy in patients with cancer requires that the informational needs of these patients be met. Most patients wish to have the maximum information about their illness and treatment. The informational needs most frequently identified preimplant how to manage side-effects, activity restrictions during implant, pain management and comfort measures, causes of current symptoms, and how the implant could affect symptoms [24]. In spite of the limitations of this study, it is reasonable to conclude that women being treated by intracavitary brachytherapy for gynecological cancer should be followed more closely to screen for anxiety. Our findings also indicate possible content areas for educational programs and for counseling patients undergoing brachytherapy.

Over the past two decades, research into the quality of life has become an integral part of clinical trials and the importance of measuring it has been increasingly recognized [25]. The aim of this study identifies and better describes the damaging effects of the disease in question and its treatment. There is little mention in the literature about conservative management of pre- and post-therapeutic psychological stress and anxiety caused by treatment, especially for ICB-HDR.

## Conclusion

Intracavitary brachytherapy causes anxiety in patients. The results clearly underline the importance of studies that focus on the psychological side-effects of treatment.

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