

## ORIGINAL ARTICLE

**Erectile dysfunction in testicular cancer patients treated with chemotherapy**C. Tasdemir<sup>1</sup>, F. Firdolas<sup>2</sup>, H. Harputluoglu<sup>3</sup>, R. Altintas<sup>1</sup> & A. Gunes<sup>1</sup>

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**Summary**

Information on male potency in testicular cancer (TC) patients treated with chemotherapy is insufficient. We aimed to assess the levels of depression and anxiety symptoms, sexual function and gonadotrophins. Participants ( $n = 27$ ) were identified and recruited from the genitourinary services of two medical centres, one in Inonu University and the other in the Firat University. All patients are TC patients treated with chemotherapy after unilateral orchiectomy. Participants completed follow-up assessments after the completion of the chemotherapy regimen. Serum luteinising hormone, follicle-stimulating hormone and testosterone levels were determined after blood samples had been taken in the morning after an overnight fast. International Index of Erectile Function (IIEF-15) was also used to evaluate erectile dysfunction (ED) score. Beck Depression and Beck Anxiety Scale were used to assess psychological symptoms. The findings indicated that men treated with chemotherapy had significantly different IIEF-15 and Beck Anxiety scores compared with men who did not receive chemotherapy. But no statistically significant difference was determined in the serum gonadotrophin levels and depression score between the two groups. It is concluded that patients with TC undergoing chemotherapy have greater risk than normal men for ED, independently of the gonadotrophin's level.

**Introduction**

Testicular cancer (TC) mainly affects young men aged between 15 and 40 years; the highest incidence is around 30 years. Therefore, the treatment effects on patients are of great importance for sexual function. Patients with TC generally report several physical sexual problems, such as erectile dysfunction (ED), ejaculatory failure and orgasmic problems. The impact of different treatment modalities, that is, surgery, radiotherapy or chemotherapy, can be the cause of these physical sexual dysfunctions (Van Basten *et al.*, 1997, 1998). However, psychological factors also play an important role in the sexuality of patients with TC, and they are known to influence more subjective aspects, such as sexual desire, sexual activity and sexual satisfaction (Jonker-Pool *et al.*, 2001; Fegg *et al.*, 2003). The improved long-term survival rates of patients with TC who were treated with chemotherapy and/or radiotherapy have led to increased awareness of the long-term side effects, including those affecting sexual activities,

which can ultimately affect the quality of life for these patients (Bloom *et al.*, 1993; Giwercman & Petersen, 2000; Althof, 2002). However, little is known about ED in patients with TC. If a patient with TC experiences problems with sexual function, this cannot only affect his own sexual satisfaction, but also that of his spouse and may even affect the marital satisfaction of both partners. The prevalence of ED after chemotherapy is poorly understood.

The aim of this study was to evaluate sexual function in TC patients treated with chemotherapy.

**Materials and methods**

A total of twenty-seven patients treated for TC with chemotherapy were recruited from both medical oncology and urology outpatient clinics during routine follow-up visits in 2010–2011. Patients who had completed cancer treatment more than 3 years previously were eligible for entry onto our study. All patients had received four cycles of cisplatin,

etoposide and bleomycin (PEB) chemotherapy (20 mg m<sup>-2</sup> cisplatin, 100 mg m<sup>-2</sup> etoposide and 15 mg m<sup>-2</sup> bleomycin). Patients older than 55 years and those with a history of pelvic/inguinal radiotherapy were excluded. The control group was selected in terms of age, education level, marital status and working conditions. A letter with information about the study objectives and an informed consent form was sent to the participants. The study was approved by the Ethics Committee of Inonu University.

## Measures

**Socio-demographic variables.** Socio-demographic variables including age, marital and employment status, educational level, time since completion treatment, smoking status and weekly alcohol intake were recorded.

**Depression.** The second edition of the Beck depression inventory-II (BDI-II) 22 was used to assess depressive symptoms. The 21-item BDI-II is a widely used self-reporting tool to measure depressive symptoms, corresponding to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition criteria of depression. The BDI-II scores range from 0 to 63 and a score of  $\geq 19$  is considered to indicate moderate to severe depression.

**Beck Anxiety Scale.** This scale measures the frequency of anxiety symptoms that a person may experience. The value of the total score indicates the height of the person's anxiety.

**International Index of Erectile Function.** The IIEF-15 is a simple and easy-to-administer test with reliable sensitivity and specificity. The IIEF has been translated and validated in several languages, including Turkish. It consists of 15 questions that assess male sexual function in five domains: erectile function (EF), orgasmic function, sexual desire, intercourse satisfaction and overall satisfaction. It has been shown that the EF domain, which includes six questions (with a maximum score of 30), provides a reliable measurement for classifying the severity of ED as mild, moderate or severe (Rosen *et al.*, 1997).

**Hormonal levels.** Serum LH, FSH and testosterone levels were also determined. Blood samples for all hormone measurements were taken in the morning after an overnight fast.

## Statistical analysis

All statistical analyses were performed using a statistical Package for Social Sciences (SPSS) v10.0 software (SPSS Inc., Chicago, IL, USA). To compare independent groups,

Student's *t*-test, Mann–Whitney *U* test and chi-square analyses were conducted.

## Results

### Baseline characteristics

Twenty-seven men treated with chemotherapy for TC at the Department of Medical Oncology and Urology in medical faculty of Inonu University were approached in writing and invited to take part in a questionnaire survey. The median patient age was 34.0 years for the TC group and 32.5 years for the control group. A full description of the participants' socio-demographic characteristics is presented in Table 1. They were treated with chemotherapy after all patients with TC had been undergone unilateral orchiectomy.

### Hormonal levels

The findings are given in Table 2. No statistically significant difference was found between the two groups regarding the FSH, the LH and serum testosterone levels.

### IIEF-15 questionnaire

The responses for the IIEF-15 and EF domain (questions 1–5 and 15) were different in each group (Table 2). Again, a statistically significant difference was found between the two groups regarding the IIEF-15 ( $P < 0.05$ ).

### Anxiety and depression

No statistically significant difference was found between the two groups according to the BDI-II. The mean level of anxiety was  $45.0 \pm 12.7$  in the TC group and

**Table 1** Socio-demographic features of the participants

Features	Control group	Testicular cancer (TC) group
Age (Mean $\pm$ SD)	32.5 $\pm$ 7.9	34 $\pm$ 8.9
Education times (Mean $\pm$ SD)	9.1 $\pm$ 3.2	8.9 $\pm$ 3.1
The time since completion treatment (Mean $\pm$ SD)	3.8 $\pm$ 0.8	4.1 $\pm$ 1.1
Unemployed no (%)	9 (30.3)	7 (25.9)
Marital status no (%)		
Married	7 (25.9)	5 (18.5)
Divorced	2 (7.4)	1 (3.7)
Unmarried	18 (66.6)	21 (77.7)
Health behaviors no (%)		
Smokers	10 (37.03)	12 (44.4)
Alcohol consumption, no (%) units per week	5 (18.5)	4 (14.8)

**Table 2** Hormone levels, international Index of Erectile Function (IIEF), Beck Anxiety and Beck Depression scores in the two groups

Hormone levels	Control group (mean $\pm$ SD)	Testicular cancer (TC) group (mean $\pm$ SD)	<i>P</i>
FSH (mIU ml <sup>-1</sup> )	6.5 $\pm$ 3.4 (0.7–11.1)	5.0 $\pm$ 4.1	>0.05
LH	6.4 $\pm$ 0.1 (0.8–7.6)	7.0 $\pm$ 0.2	>0.05
Total testosterone (ng ml <sup>-1</sup> )	616 $\pm$ 15 (181–758)	612 $\pm$ 13	>0.05
Sexual function measure			
IIEF-15	50.0 $\pm$ 14.4 (55.8–69.0)	34.2 $\pm$ 10.0	<0.05
Beck Anxiety Score	10.1 $\pm$ 6.8	45.0 $\pm$ 12.7	<0.05
Beck Depression Score	12 $\pm$ 2.3	13.2 $\pm$ 2.1	>0.05

10.1  $\pm$  6.8 in the normal population. A statistically significant difference was found between the two groups regarding the anxiety score ( $P < 0.05$ ) (Table 2).

### Comments

Testicular cancer is one of the most common cancers among young men, and its incidence is increasing in many countries (Parkin *et al.*, 1992). Thus far, most attention has been paid to the survivors of childhood cancer (Relander *et al.*, 2000), as well as men who suffered malignancies in young adulthood, mainly for testicular germ cell cancer (Fossa *et al.*, 1993). Several studies focused specifically on sexual functioning after TC because this type of cancer involves an organ associated with sexuality and occurs in a phase of life in which sexuality is of great importance (Gerl *et al.*, 2001; Nazareth *et al.*, 2001; Fegg *et al.*, 2003). It is now obvious that cancer per se or its treatment might be associated with the impairment of male sexual and reproductive function (Giwerzman & Petersen, 2000).

Erectile dysfunction is perceived as a spectrum, at one end there is psychogenic ED, while at the other end there is organic/physical ED. Both the diagnosis and treatment of cancer are sources of stress to patients. These problems may be especially disabling for young people who have been treated for cancer (Nazareth *et al.*, 2001).

The data for hormonal levels after chemotherapy have been inconclusive in the published studies. The effect of treatment of testicular tumours on the serum testosterone level and the prevalence of ED are poorly understood. The incidence of hormonal abnormalities in patients with ED is approximately 10–20%. Gerl *et al.* (2001) reported that the reduction in serum testosterone levels was particularly significant in patients who received chemotherapy. However, Lackner *et al.* (2005) showed that none of the treatments investigated had a significant influence on the serum hormonal levels in long-time survivors of TC. Patients undergoing chemotherapy have no greater risk of developing hormonal deficiency than those following a surveillance strategy,

and therapy for TC is not a risk factor for ED (Lackner *et al.*, 2005; Pühse *et al.*, 2011). Also, the role of serum testosterone in ED is controversial (Ahn *et al.*, 2002; Rhoden *et al.*, 2002).

Brennemann *et al.* (1997) found insufficient Leydig cell function until 60 months after treatment. Inguinal semi-castration and subsequent chemotherapy also lead to sexual disorders, which usually improve within 1 year (Arai *et al.*, 1997; Van Basten *et al.*, 1999). However, Berger *et al.* (1996) showed that subnormal levels of testosterone and raised LH levels were common after chemotherapy, and Pectasides *et al.* (2004) found no influence of chemotherapy on gonadal function. In our study, we observed no statistically significant differences in LH and serum testosterone levels between the chemotherapy and control groups.

Previous studies showed that 20–38% of patients with cancer experience difficulty in resuming productive work and family relationships after a primary diagnosis of cancer. Some patients who survived cancer later suffer physical disability, employment discrimination or marital problems (Fobair *et al.*, 1986). Cella (1983) and Tross (1984) studied one hundred and two patients with testicular malignancy. They found that patients with TC had more depression, anxiety, somatic concern, fear of death, and intrusive or avoidant thinking about the illness than noncancer controls. Dahl *et al.* (2005) found that anxiety disorders are more common in testicular patients and patients who have undergone chemotherapy compared to the normal population. However, the rate of depression with testicular malignancies shows no difference to the normal population. In our study, we also found results parallel to Dahl *et al.* (2005); the anxiety rates were all higher than those in the normal population. Also, we assume that lower rates of IIEF scores in these patients may be associated with the fear of losing a sexual organ with sexual function.

### Conclusions

The results of this study show that TC patients treated with chemotherapy are at greater risk than normal men

for ED independently of gonadotrophin levels. Chemotherapy had no influence on hormone levels or sexual disorders. Lower IIEF scores may be due to anxiety of losing a sexual organ in patients with TC.

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