

Seminar article
Quality of life among testis cancer survivors

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Abstract

Background: As the most common cancer among males in late adolescence and early adulthood and as a disease with a 5-year relative survival rate of 96%, testis cancer has many survivors who live many years during which chronic toxicities may impair their quality of life.

Methods: In this review, I aimed to summarize the most relevant literature on quality of life among testis cancer survivors identified via PubMed literature search between 1990 and 2015.

Results: Survivors of testis cancer experience an overall quality of life (QOL) that is not measurably different from that of men of the same age in the general population. Nonetheless, testis cancer and its treatments can result in a variety of long-term conditions that affect QOL. These include peripheral neuropathy, hearing loss, tinnitus, fatigue, and Raynaud-like phenomenon. Exercise interventions have been shown to improve fatigue and overall QOL in cancer survivors, and there is evidence that psychosocial and mind-body interventions may also be beneficial. Pharmacological interventions have not been shown to be helpful for cancer-related fatigue, hearing loss, or neuropathy.

Conclusions: Testis cancer survivors should be asked about symptoms related to the conditions above and referred to specialists as indicated. Survivors complaining of fatigue should be encouraged to adopt a regular program of aerobic exercise. © 2015 Elsevier Inc. All rights reserved.

Keywords: Testis cancer; Germ cell tumors; Survivors; Survivorship; Quality of life; Fatigue; Neuropathy

Most studies indicate that overall health-related quality of life (QOL) is similar among testis cancer survivors and the general population [1–9]. Although QOL clearly deteriorates at the time of diagnosis and during treatment, it subsequently returns to normal levels, as defined by matched controls or the general age-matched population. Nonetheless, there are numerous chronic conditions resulting from testicular cancer diagnosis and treatment that afflict survivors and affect QOL, including peripheral neuropathy, hearing loss, tinnitus, Raynaud-like phenomena, fatigue, anxiety, and sexual and fertility problems (Table). Although these conditions may not affect global measures of QOL, it would be hard to argue that they are irrelevant to the QOL of those experiencing them. Measuring QOL in a meaningful and reliable way remains challenging.

Survivors who are at the greatest risk for long-term symptomatic side effects are those whose treatment

included chemotherapy. Postchemotherapy resection of residual masses can also result in chronic problems such as loss of antegrade ejaculation. Although radiation therapy for testis cancer is associated with an increased risk of second cancers and death from gastrointestinal disease, it is associated with fewer long-term symptomatic side effects [10,11].

QOL studies

Numerous studies have assessed QOL in survivors of testis cancer. In 2005, a Norwegian study compared 1,409 testis cancer survivors treated from 1980 to 1994 with 2,678 men with a similar age distribution from the general population using the Medical Outcome Study 36-item Short Form Survey and the Impact Event Scale of mental symptoms–caused traumatic stress [1]. With a median follow-up of 11 years, no clinically significant difference in QOL was reported. A history of treatment for testis cancer explained only 0.3% to 0.7% of the variance in the

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Table
Common chronic complaints of testis cancer survivors

Problem	Percentage of patients affected	Risk factors	Treatment
Fatigue	17% (vs. 10% in controls)	Unclear	Exercise regimen
Peripheral neuropathy	22%–29% ^a	Cisplatin, vinblastine and paclitaxel chemotherapy Radiation therapy	Gabapentin
Raynaud-like phenomena	37%–39% of those treated with chemotherapy	Bleomycin, higher number of cycles of chemotherapy	Keep hands and feet warm; calcium channel blockers
Tinnitus	22%–25%		None
Hearing loss	20%–40%	Higher cumulative cisplatin dose; history of noise exposure	None

^aFigures are higher for those receiving more than 4 cycles of chemotherapy and lower for those receiving no chemotherapy (see text).

QOL measures. Survivors did have the following statistically significant differences from controls, but the small magnitude of the differences was not judged to be clinically significant: more bodily pain, less vitality, poorer social function, and better mental health. Side effects of treatment were strongly associated with lower QOL, with gastrointestinal and sexual side effects having the largest effect. Among survivors, gastrointestinal and sexual problems were more common among those who had undergone retroperitoneal lymph node dissection (RPLND), radiation therapy, or chemotherapy than in those treated with orchiectomy alone. There were no significant QOL differences associated with the different treatment modalities when comparing chemotherapy, radiation therapy, and RPLND.

Similarly, in 2002, a French study of 71 testis cancer survivors and 119 healthy controls with a median follow-up of 11 years reported no differences in health-related QOL or familial or professional life [12]. However, when compared with controls, cases did report less sexual pleasure and desire as well as more erectile dysfunction. The largest difference was that 31% of cases when compared with 2% of controls ($P < 0.001$) reported difficulty in borrowing money from banks, a difference that persisted even when controlling for income level and professional status. Treatment modalities in this study included surveillance, chemotherapy, RPLND, and radiation therapy. QOL was not associated with the type of treatment. Among cases, fatigue was associated with lower functional and symptom scale QOL scores as well as with diminished sexual life. Fatigue did not differ by treatment modality. Fleer et al. [2] published a study of 354 testis cancer survivors in the Netherlands and reported that survivors had a QOL that was similar to that in a reference group. Not surprisingly, men who were unemployed and had a chronic disease were at an increased risk of impaired functioning.

There were 2 other studies that reached similar conclusions. Kim et al. [8] published a case-control U.S. study of members of the armed forces that compared 246 testis cancer survivors and 236 controls and reported some sustained health effects and physical limitations among

cases but found that overall QOL was similar to that of controls. In this study, chemotherapy was associated with lower physical component scores, including physical functioning and role physical measures, as well as lower self-reported general health and social functioning. A study by Rossen et al. [4] of 401 Danish survivors of testis cancer who had been diagnosed in the 1990s reported that QOL among survivors was the same as that of age-matched men in the general population. Treatment with chemotherapy was associated with peripheral neuropathy, ototoxicity, and Raynaud phenomena.

Taken together, these studies indicate that overall QOL is similar in testis cancer survivors and the general population and that there are subgroups of testis cancer survivors whose QOL is impaired in ways that appear to be directly related to their illness and treatment. A Polish study, for example, evaluated anxiety, depression, sexual function, and QOL in 326 testis cancer survivors and reported that elevated serum gonadotropin levels were associated with depression, sexual problems, and diminished physical well-being [13]. In this study, elevated luteinizing hormone and follicle-stimulating hormone levels were seen in 55% and 49% of subjects, respectively, and low serum testosterone levels were found in 15%. In addition, as noted earlier, chemotherapy is associated with a variety of specific chronic side effects. A Norwegian study of 1,428 testis cancer survivors reported that neuroticism was associated with a variety of QOL complaints, including reduced physical function, neurotoxic side effects, and sexual problems [14].

Another way of looking at the QOL issue is from the perspective of needs assessment. In 2013, an Australian study reported that among 244 testis cancer survivors completing a survey, 66% had one or more unmet supportive care needs [15]. The average number was 4.7, and life stress and relationship issues figured prominently. However, there was no control group. A Swedish study of 974 testis cancer survivors with a mean time since diagnosis of 11 years reported that 63% described a crisis related to their cancer diagnosis and more than 60% of those not offered counseling or information about stress and crisis reaction

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