JBUON 2017; 22(5): 1333-1337
ISSN: 1107-0625, online ISSN: 2241-6293 • www.jbuon.com
E-mail: editorial_office@jbuon.com

ORIGINAL ARTICLE

The role of the multidisciplinary team in the decision making process in stage one testicular cancer – retrospective cohort analysis

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Summary

Purpose: *To analyze the role of a multidisciplinary team (MDT) in the decision-making process in clinical stage one (CS I) testicular cancer (TC).*

Methods: *We retrospectively evaluated data on 115 consecutive patients with CS I TC (excluding stage IS) who were referred to the Department of Oncology, University Hospital of Split, Croatia, from 2003 to 2012. Fifty-six patients (48.7%) were referred between 2003 and 2007, before the introduction of the MDT and 59 patients (51.3%) between 2008 and 2012, after the introduction of the MDT. We evaluated the overall treatment outcome (cure rate) and the total number of patients with CS I TC who were treated or monitored: in seminoma (SA) group adjuvant radiotherapy (ART) vs adjuvant chemotherapy (ACT) or active surveillance (AS) and in non-seminoma (NSA) group retroperitoneal lymphadenectomy (RPLND) vs ACT or AS.*

Results: *After the introduction of the MDT we stopped using ART for CS I SA, and significantly increased the usage of ACT and AS ($p<0.001$). RPLND in CS I NSA was used significantly less often after the introduction of the MDT while the usage of ACT and AS increased ($p=0.047$).*

Conclusion: *With the MDT introduction we significantly changed the approach to patients with CS I TC. More aggressive and more toxic forms of the postoperative treatment were replaced by AS or less toxic ACT. Despite less aggressive adjuvant treatment approach, significant changes in the cure rate between two time periods were not noticed.*

Key words: *multidisciplinary team, testicular cancer*

Introduction

TC is the most frequent malignancy in young men, with continuous rise in the incidence in the last three decades [1]. Patients with TC, particularly in CS I, regardless of histopathology, i.e. SA or NSA, present a unique management challenge for both the urologist and the oncologist. A significant majority of patients (80-85% in SA and 70% in NSA) with CSI TC is cured by surgery alone, without additional adjuvant therapy [2]. With ACT and ART, the cure rate rises to 95-96% in SA and 97-98% in NSA [2]. The goal of treatment of this patient population is cure, but also to maintain the quality of life and fertility. The reduced risk of relapse resulting from the use of adjuvant therapy has to be balanced against the potential acute and long-term adverse events (AEs) in this patient population with normal life expectancy [3]. Gastrointestinal toxicity, cardiovascular toxicity, reduced fertility or occurrence of secondary cancer in the radiation field and secondary leukemia as the consequence of irradiation of the pelvic bone marrow are possible late AEs of ART in SA while retrograde ejaculation could be the result of RPLND in NSA [4-7]. Furthermore, published

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Received: 25/02/2017; Accepted: 12/03/2017

AEs data on RPLND is largely based on the experience in high-volume centers. When performed by experienced surgeons, RPLND carries a small risk of retrograde ejaculation (<5%) [8-10]. Conversely, a problem in low-volume centers with unexperienced surgeons as well as other members of the MDT exists, when more surgical AEs are expected and also, when there is potentially a higher tendency of application of adjuvant treatment due to lack of confidence of the MDT members. However, most patients with CS I NSA who undergo RPLND do not have metastatic disease and have had unnecessary major surgery [8-10]. Therefore, in order to avoid AEs of adjuvant therapy or additional diagnostic surgery, it is very important to assess patients who would be candidates for AS only or for less toxic therapeutic options after orchiectomy [1-2 cycles of ACT with carboplatin monotherapy (CMT) in SA or 1-2 cycles of ACT with bleomycin, etoposide, and cisplatin (BEPx1-2) in NSA]. With regularly performed AS, and a proper therapy on relapse, almost all patients can be cured [2]. This approach has been developed, primarily, because of lack of experienced urologists outside of specialized centers [11,12]. The decision on how to optimally treat or monitor a patient is individualized, knowing the characteristics of the patient (e.g., age, comorbidities, preferences,...), tumor (e.g., presence or absence of lymphovascular invasion) and therapy (surgical procedures, chemotherapy or radiotherapy) [13]. Understanding the natural history and complications of TC therapy, combined with a systemic evaluative process, can allow the MDT to comprehensively address the needs of the individual patient with TC [14]. Another problem in the multidisciplinary approach is an economically challenging environment, where many patients with malignant tumors are not presented to the MDT. Consequently, overtreatment based on lack of expertise and insecurity of medical specialists involved in the therapy is a rather common case.

The impact of the MDT for urological tumors on the treatment of patients with CS I TC in a single oncology institution and changes in approach to treatment in this group of patients over time with the introduction of the MDT in 2007 was retrospectively investigated in this study.

Methods

We retrospectively evaluated data on a cohort of 115 consecutive patients with CS I TC, excluding stage IS, who were referred to the Department of Oncology, University Hospital of Split, Croatia, between 2003 and 2012. The cohort was divided into two groups of patients according to the time period in which they were reffered to our institution. Fifty-six patients (48.7%) were referred between 2003 and 2007, i.e., before the introduction of the MDT and 59 patients (51.3%) were referred between 2008 and 2012, i.e., after the introduction of the MDT. Patients' characteristics are shown in Table 1. We evaluated the overall treatment outcome (cure rate) and the total number of patients who were treated or only monitored, without any active treatment, during the observed period according to histopathological type of TC: in SA group ART vs ACT or AS and in NSA group RPLND vs ACT or AS.

Statistics

Statistical significance was set at $p<0.05$. In all instances two-tailed statistical tests were used. We described distributions of age by median (interquartile range), because Shapiro-Wilk test indicated significant deviations from normal distribution in SA sample. Differences in the usage of particular adjuvant therapies or AS and the treatment outcome (cure rate) between the two time periods were analyzed by Pearson x^2 test for SA and by Fisher exact test for NSA because of the smaller sample size. Difference in age at diagnosis between the two periods was analyzed by Mann-Whitney U test. Statistical data analysis was done by NCSS 10 Statistical Software (2015) (NCSS, LLC. Kaysville, Utah, USA, ncss.com/software/ncss).

Results

We examined the health records of 115 consecutive patients. The first group of patients (n=56) was diagnosed and treated between 2003 and 2007. The second group of patients (n=59) was diagnosed and treated between 2008 and 2012. These two groups of patients were very similar in regard to patients' age at diagnosis and histological type (Table 1).

Change of CS I TC treatment

After the introduction of the MDT, we stopped using ART for CS I SA, and significantly increased the usage of ACT and AS ($x^2=31.68$, df=2, $p<0.001$) (Table 2). RPLND in CS I NSA was used significantly less often after the introduction of the MDT while the usage of ACT and AS increased from 7.1% to 41.2%, and from 14.3% to 23.5% respectively (Fisher's exact test, p=0.047) (Table 2).

Treatment outcome

We did not notice significant changes in the treatment outcome (cure rate) between the two time periods (Table 2).

Table 1. Patients' age and clinical characteristics before and after the introduction of MDT

Characteristics	*Year of diagnosis*				*p value**
	2003-2007 (n=56)		*2008-2012 (n=59)*		
Age at diagnosis (years), median (IQR)	33	(28-38)	36	(31-41)	0.146
Histological type, n (%)					
SA	42	(75.0)	42	(71.2)	0.645
NSA	14	(25.0)	17	(28.8)	
Age at diagnosis (years), median (IQR)					
SA	35	(29-39)	37	(32-42)	0.170
NSA	30	(24-35)	33	(26-38)	0.336

IQR : interquartile range, SA : seminoma, NSA : nonseminoma, p*: Mann-Whitney U test statistical significance of the difference in age, x^2 test for differences in histological type

Table 2. Treatment of clinical stage I testicular cancer

Treatment	*SA*					*NSA*				
	2003-2007 (n=42)		*2008-2012 (n=42)*		*p value**	*2003-2007 (n=14)*		*2008-2012 (n=17)*		*p value**
RPLND, n (%)						11	(78.6)	6	(35.3)	0.047
Adjuvant therapy, n (%)										
ART	23	(54.8)	0	(0.0)	<0.001					
ACT	16	(38.1)	35	(83.3)		1	(7.1)	7	(41.2)	
AS	3	(7.1)	7	(16.7)		2	(14.3)	4	(23.5)	
Treatment outcome, n (%)										
Cure rate	42	(100.0)	41	(97.6)	0.314	14	(100.0)	16	(94.1)	0.356
	0	(0.0)	1	(2.4)		0	(0.0)	1	(5.9)	

SA: seminoma, NSA: nonseminoma, RPLND: retroperitoneal lymph node dissection, ART: adjuvant radiotherapy, ACT: adjuvant chemotherapy, AS: active surveillance

*Fisher's exact test

Discussion

Every newly diagnosed or recurrent TC patient should be cared for by the MDT. This is because the diagnosis, treatment and care of a patient with TC can be very complex and they are best provided by bringing together people with all the necessary skills, knowledge and experience [13,15]. The importance of the MDT is not only to obtain the maximum efficacy of the treatment, better outcome and cure but also to avoid unnecessary diagnostic tests, to prevent overtreatment and to ensure the quality of life of the patients [13,15].

It is important that MDTs involve all key professionals in making clinical decisions on an individual patient, including surgeons, radiologists, pathologists, oncologists, clinical nurse specialists, and allied health professionals (psychologists, physiotherapists, occupational therapists,...) [13,15]. MDTs, including those for urological tumors, are considered the gold standard of cancer care in many healthcare systems, but a clear definition of their format, scope of practice and operational criteria is still lacking, especially in challenging environments such as developing and low-income countries where the level of oncology care is low and modern oncology treatments are not available. Until we have reliable and strong data on multidisciplinary approach (randomized and prospective studies), we can refer to the results of important retrospective trials, regardless of the type of tumor. In the United Kingdom, MDTs are associated with the improved 5-year survival in colorectal and oesophageal cancer and the improved 2-year survival in head and neck cancer [16-18]. A recent systematic review has also reported the evidence of the improved survival in lung cancer [19]. Swedish and Scotish trials have demonstrated that the introduction of the MDT was associated with improved relative survival of breast cancer patients [20,21]. Although there are recommendations that decision on the optimal treatment of patients with urological tumors should be made by the MDT, strong clinical trial data, whether retrospective or prospective, on the impact of the MDT on the outcome of patients with urological cancers, particularly testicular cancer, is still lacking [13,22].

Although generally accepted that the MDT management of cancer patients improves the patient outcome, there is a number of barriers that

prevent the full realisation of these benefits in Croatia and similar countries, especially in South-East Europe. Such barriers include insufficient facilities, time constraint and poor interprofessional relationships. Having MDTs in low-volume centers or small hospitals may also be challenging as all the required specialists necessary for an MDT may not be available in such hospitals. Therefore, it is very important that this is legally regulated at the national level.This would certainly improve the quality of the treatment and the outcome of cancer patients in many hospitals.

In this retrospective study, we evaluated data on CS I TC patients approach at our institution and changes in therapeutic modalities in this group of patients over 10 years period, especially with the introduction of the MDT for urologic tumors. Our MDT includes oncologists, urologists, pathologists, a clinical nurse specialist and an MDT coordinator, each of them contributing independently to the diagnostic and treatment decision. The members of the MDT meet once a week to discuss their decisions on individual patient treatment.

We found that by introducing the MDT we substantially changed the approach to patients with CS ITC. More aggressive and more toxic forms of the postoperative treatment, such as ART (for SA) and RPLND (for NSA) were replaced by AS or less toxic ACT (for both histological types). In addition, these young patients were not only spared of early and late AEs of therapy, but also, despite less aggressive treatment approach, the rate of disease control remained unchanged in both observed groups. We think that, besides the increased amount of evidence and data from available clinical studies on the importance of sparing young patients with CS I TC from aggressive treatment options that have arrived since the beginning of the last decade, the implementation of the MDT at our institution has had the greatest impact on the application of less aggressive methods of the treatment to this group of patients. Collaboration among all team members and joint analysis of the results of available and relevant clinical studies were reflected in decisions on the optimal approach to patients with CS I TC.

The findings of this study should be interpreted in light of the study limitations.The main limitation of our study was its retrospective nature, small sample size as well as the lack of randomization.

In conclusion, this study has shown the importance of the MDT in the decision-making process in CS I TC patients. The optimal approach to this subgroup of patients is possible only through the MDT, cooperation of experts and applying evidence-based medicine. We have shown that the implementation of the MDT for urological tumors was the turning point in our clinical practice as well as in the treatment of young men with early-stage TC.

Conflict of interests

The authors declare no confict of interests.

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