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Testis Cancer

Impact of Diagnostic Delay in Testis Cancer: Results of a Large Population-Based Study

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Abstract

Objective: Testis cancer is the most common cancer in young men, and its incidence continues to rise. Even if prognosis is considered as good, a group with bad prognosis still remains. Diagnostic delay (DD), defined as the time elapsing from the onset of tumour symptoms to the day of diagnosis, is a way to evaluate the rapidity of diagnosis. We assessed the relationship between DD, disease stage, and survival rate.
Methods: A series of 542 patients diagnosed with a germ cell tumour between 1983 and 2002 at health facilities in the Midi-Pyrenees region, southwest France, were asked about DD. We analysed DD together with data regarding the disease (histologic type, stage), its treatments, and prognosis (impact on survival).
Results: Mean DD was longer in seminoma (4.9 ± 6.1 mo) than in non-seminomatous germ cell tumour (NSGCT; 2.8 ± 4.0 mo). DD was correlated with disease stage for the whole population ($p = 0.014$) and for NSGCT ($p = 0.0009$), but not for seminoma. DD had a significant impact on the 5-yr survival rate in the overall population ($p = 0.001$) and in the NSGCT group ($p = 0.001$), but not in the seminoma group. Global trends in mean DD did not change over the 20-yr study period, but we observed a slight decrease during the last decade.
Conclusions: DD is highly correlated with stage and survival in NSGCT. Urologists should promote programmes to enhance awareness and knowledge of testis cancer, so the diagnosis can be made more rapidly.

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1. Introduction

Testis cancer (TC) is the most common cancer in young men and its incidence has been recently rising in nearly all industrialised countries [1]. Before the advent of modern chemotherapy the diagnostic delay (DD), defined as the time elapsing from the onset of tumour symptoms to the day of diagnosis, was correlated with bad prognosis. In 1981, Bosl and colleagues observed that length of DD was highly correlated with cancer stage [2]. Similarly, in patients diagnosed with TC between 1965 and 1977, Ware and colleagues observed that the longer the DD, the more advanced the disease stage in non-seminomatous germ cell tumours (NSGCTs) as well as in seminoma [3].

In more recent studies including patients treated with cisplatin-based chemotherapy, results were much more contradictory. In patients diagnosed with TC between 1970 and 1987 in a urology department, Moul and colleagues observed that in the NSGCT group, DD strongly affected survival in the pre-cisplatin era (1970–1978), but not after 1979 [4]. In a series of patients with NSGCT who had received modern chemotherapies, a DD $>$ 3 mo was associated with lower survival in univariate analysis, but was no longer associated after adjustment for confounding factors (tumour extension, year of diagnosis, and treatment unit) [5]. In 140 consecutive TC cases diagnosed between 1994 and 1995 in a urology department, Toklu and colleagues found no correlation between DD and disease stage [6]. Finally, due to different time series (before and after introduction of modern chemotherapies) and to small patient series, it was difficult to reach a conclusion as to the impact of DD on survival.

In a large regional population-based study over 20 yr, we aimed to (1) describe diagnostic features (DD, symptoms), (2) analyse trends in DD over the study period, and (3) assess the influence of DD on survival.

2. Methods

2.1. Study population

Among 577 patients diagnosed with TC from 1983 to 2002 at health facilities (all private and public urologic and oncologic units) in the Midi-Pyrenees region, southwest France, we selected those who had a germ cell tumour. Seventeen patients with a lymphoma, 17 patients with a Leydig cell tumour, and 1 patient with a Sertoli cell tumour were therefore excluded.

2.2. Data collection

All 542 patients were asked prospectively about diagnosis and first symptoms during the first consultation at the cancer centre. Each patient was asked to provide information about the month and year when he first noticed a symptom related to TC and to describe the type of symptom. If data were missing, a mailed questionnaire was sent to the patient. An informed consent form to be completed by each patient and returned with the questionnaire was also included.

Information regarding the disease, treatments, and follow-up data was obtained through medical files. Histologic type of tumour was recorded according to the World Health Organization (WHO) classification. Stages were defined according to the modified Boden and Gibb classification: stage I, confined to the testis; stage II, with retroperitoneal lymph node metastasis; and stage III, with mediastinal or supraclavicular lymph nodes or generalised visceral metastasis. Lastly, we obtained information regarding the nature and the date of occurrence of the first symptoms and oncologic data for 439 (81%) of patients, who made up our study population.

2.3. DD measurement

Testis cancer DD was defined as the interval of time (calculated in months) from the onset of the first TC symptom to the day of orchiectomy. We were able to obtain the date of orchiectomy for all patients through urologic records.

For analysis of time trends in DD, the period of study 1983–2002 was divided into five 4-yr periods, 1983–1986, 1987–1990, 1991–1994, 1995–1998, and 1999–2002.

2.4. Statistical methods

Statistical analysis was performed using STATA® 8.0 software. The χ^2 test or Fisher exact test was used for comparison of proportions in subgroups. The Student, Mann-Whitney, or Kruskal-Wallis test was used for equality of means between subgroups. An extension of the Wilcoxon test was used for trend across ordered groups. A level of 0.05 was considered as significant. Overall survival and tumour-specific survival were calculated with the Kaplan-Meier method. Differences in survival rates between patient subgroups were evaluated with the log-rank test [7].

3. Results

3.1. Population

In our study population of 439 subjects, seminoma accounted for 196 cases (45%) and NSGCT for the 243 remaining cases (55%). Mean age at diagnosis was 37.0 ± 10.5 yr for seminoma and 27.7 ± 8.4 yr for NSGCT ($p < 0.001$).

Regarding tumour stage, seminoma stages were significantly lower than those of NSGCTs ($p < 0.001$; Table 1). All 439 patients had had orchiectomy, 147 patients received lumboaortic or iliac lymph node irradiation with doses of 2040–3600 cGy, and 174 were treated with cisplatin-based chemotherapy (2–5 cycles Platinol, vinblastine, bleomycin [PVB] in 19 cases; 2–3 cycles adjuvant bleomycin, etoposide,