Cancers of the testis

Case numbers and histological types
An average of 132 cases of testicular cancer was diagnosed per year in Ireland between 1994 and 2010 (Table 1). Almost all cases were microscopically verified (98%) and were germ-cell tumours—57% of which were seminomatous and 40% non-seminomatous subtypes. Non germ-cell subtypes, of which less than 2 cases were diagnosed per year, included sarcomas and sex cord tumours.

<table>
<thead>
<tr>
<th>Table 1. Annual average number of testicular cancers diagnosed in Ireland and percentage of histological types, 1994–2010</th>
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</thead>
<tbody>
<tr>
<td>cases per year</td>
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<tr>
<td>incidence rate (cases per 100,000 per year)</td>
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<tr>
<td>histological subtype</td>
</tr>
<tr>
<td>non-seminomatous germ cell</td>
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<tr>
<td>seminoma</td>
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<tr>
<td>spermatocytic seminoma</td>
</tr>
<tr>
<td>sarcoma</td>
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<tr>
<td>sex-cord seminoma</td>
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<tr>
<td>other/unspecified</td>
</tr>
</tbody>
</table>

Age profile
Testicular cancers are more common in young men; three-quarters of all patients in Ireland were under 40 years at diagnosis (Figure 1). The highest incidence rates were in patients aged between 25 and 34.

Time trends in incidence and mortality
There has been a clear increase in case numbers and incidence rates per year for testicular cancer in Ireland since 1994. The overall annual percentage increase in age-standardised rate was 2.1% (±1.5%) between 1994 and 2010 (Figure 4). Similar trends have been reported internationally, and worldwide incidence rates have more than doubled in the past 40 years.3

Testicular cancer is relatively rare compared to other cancer sites and overall makes up less than 2% of all invasive cancers diagnosed in men.2 However in young patients, it is one of the most common cancers, representing 30% of all cancers in 25-39 year olds (Figure 2). Very few men aged over 50 are diagnosed with testicular cancer (less than 10 per year).
Despite the increase in incidence, mortality rates for testicular cancer have fallen substantially in Ireland since the 1950s (Figure 5). Although mortality rates have been variable between years, a clear decline is evident, from the maximum rates during the 1970s, when up to 20 deaths per year were registered, to recent years when fewer than 10 people per year have died from this cancer. Most of this decline in mortality occurred over a relatively short period between 1981 and 1985.

**International variation in incidence and mortality**

The highest incidence rates of testicular cancer were recorded in Norway and Denmark (>10 cases per 100,000 per year, world age standardised rate) while the lowest incidence in Europe was recorded in Spain, Portugal and Greece (<3 cases per 100,000 per year) (Figure 6). Spatial and temporal variation in testicular cancer incidence rates in Europe has been the subject of some debate, with exposure to environmental pollutants and genetic predisposition cited as possible risk factors. Differences in disease awareness have also been proposed as an explanatory factor. Incidence in Ireland was approximately 20% higher than the average for the 25 countries examined but was similar to that in the Netherlands and Germany. Mortality rates varied less between countries, and averaged 0.3 deaths per 100,000 per year with Ireland ranking close to the average.

**Figure 5. Trends in testicular cancer mortality, 1955–2009**

[Graph showing trends in testicular cancer mortality from 1955 to 2009]

**Stage at diagnosis**

The majority of testicular cancers are diagnosed at an early stage (stage I), particularly seminomas, which tend to be slower growing than non-seminomatous tumours (Figure 7). Overall, more than 60% of all testicular cancers were diagnosed at stage I. A slight decline over time was observed in the proportion of stage I tumours, with a corresponding increase in stage II tumours, where cancer is present in the lymph nodes. However, this may be influenced by improvements in imaging techniques over time, allowing for more accurate staging. Although a greater proportion of non-seminomatous cancers were late stage (stage III) compared to seminomas, their numbers overall were small (<150 cases in the 17 year period) and the proportion has declined over time, from 20% in 1994-1998 to 14% in 2005-2010.

**Figure 7. Percentage of testicular cancers by stage for seminoma and non-seminomatous subtypes, 1994-2010**

[Bar chart showing percentage of testicular cancers by stage for seminoma and non-seminomatous subtypes from 1994 to 2010]

**Treatment**

Almost all patients diagnosed with testicular cancer undergo surgery as their main treatment (Figure 8). Surgery normally involves the removal of the entire testis, as recommended by international guidelines and very few patients (<3% in Ireland) have a local excision only.

The decision to administer chemotherapy or radiotherapy is determined by both the type of tumour and the stage of the disease. Between 50% and 60% of all patients with seminoma received radiotherapy in addition to surgery (Figure 8). In contrast, few patients (<5%) with non-seminomatous tumours had radiotherapy, but were more likely to have chemotherapy.

Overall, there has been little change over time in the proportion of patients having surgery and chemotherapy. However, there has been a recent decline in the proportion of seminoma patients undergoing radiotherapy.

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*Note: the rates shown are world age standardised (so Irish rates appear somewhat higher than in Figure 4 (European age standardised rates))

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**Figure 6. Incidence for testicular cancer in 25 countries, 2008**

[Bar chart showing incidence for testicular cancer in 25 countries in 2008]

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Survival

Testicular cancer has one of the highest cure rates of all cancers, with a 5 year relative survival overall of over 96% (Figure 8). Patients diagnosed with seminoma had five-year survival rates of close to 99%, which may reflect the fact that the majority of patients are diagnosed at an early stage (stage I). Long term prognosis for testicular cancer is very good - for those patients diagnosed in Ireland in 1994 and 1995, the earliest years for which national data are available, 86% are known to have survived at least 15 years after their diagnosis.

References and notes

1. Cancer in Ireland, 2011. Annual report of the National Cancer Registry. NCRI.

International variation in survival

Five year relative survival of testicular cancer patients is generally high in all developed countries and the most recent estimate for Europe overall was 97% (Figure 9). Variation between countries is fairly low and Ireland is ranked close to the European average.