1.1. Patients with early testicular cancer receiving adjuvant treatment after surgery (QA-9)

1.1.1. Documentation sheet

Description	Proportion of patients with early testicular cancer (stage I) receiving adjuvant treatment after orchiectomy (%)
Calculation	**Numerator**: number of patients receiving adjuvant treatment after surgery **Denominator**: number of patients with testicular cancer clinical stage I treated with orchiectomy
Rationale	Testicular cancer is an uncommon cancer (435 new cases in 2021 in Belgium[a]) which generally affects men in the 20-39 age category (76.6% in 2021).[1] Good clinical practice recommendations advise surveillance after surgical removal of the testis (not to be confused with lymphadenectomy) in case of stage I disease (i.e. localised tumour), especially in absence of risk factors (i.e. rete testis invasion and tumour size in case of seminomas and vascular invasion in case of non-seminomas).[2] Alternatively, adjuvant treatment (i.e. chemotherapy or radiotherapy or retroperitoneal lymph-node dissection) can be offered. The guidelines recommend surveillance (follow-up) after surgery for a stage I testicular tumour: KCE guidelines[3] (2010) and ESMO guidelines[2] (2013). The current analysis distinguishes three periods: before the ESMO guidelines (2004-2012), the period shortly after (2013-2016), and the most recent period (2017-2020). The rationale of the guideline is to limit unnecessary long-term side effects of radiotherapy and chemotherapy.
Data source	Belgian Cancer Registry (BCR): incidence years 2004-2020. IMA – AIM
Technical definitions	Selection of patients: • Patients with new diagnoses of cancer registered in the BCR in the period 2004-2020, with ICD-10 code C62 (testicular cancer) • Clinical Stage I The following exclusion criteria have been applied: • Patients without official residence in Belgium at date of diagnosis • Patients with no NSSN known • Patients with no IMA – AIM data available in incidence year • The Region of the hospital where surgery was performed is taken into account for the analyses The following interventions (nomenclature) have been identified for patients in the GZSS (health care) IMA – AIM database: • Surgery: 261111-261122, 261096-261100, 262570-262581, 241312-241323, 241334-241345, 241872-241883, 241894-241905, 241113-241124, 241150-241161, 260750-260761, 611796-611800, 260713-260724, 260853-260864, 260875-260886, 260890-260901, 262172-262183, 684213-684224, 154932-154943 • Curative external radiotherapy: 444135-444146, 444150-444161, 444172-444183, 444113-444124

[a] https://kankerregister.org/Statistiques_tableaux%20annuelle

	• Retroperitoneal lymph node dissection: 240450-240461, 240472-240483, 243751-243762, 243773-243784, 240494-240505, 240516-240520
	• Chemotherapy has been identified by ATC codes « L01 » with the exception of some CNK codes (710566, 1092857, 1174481, 1174499, 38521 and 706044) in the Pharmanet-Farmanet IMA – AIM database
	  ○ Carboplatin: L01XA02
	  ○ BEP (bleomycin + etoposide + cisplatin): L01DC01, L01CB01, L01XA01
	Testicular tumours were classified as seminomas and non-seminomas using the definition of the EUROCARE-5 study[4]:
	• seminomas: ICD-O-3 morphology codes 9060-9062
	• non-seminomas: ICD-O-3 morphology codes 9080-9083; 9085; 9100-9102; 9065; 9070-9072
	
	Tumours were classified as seminomas and non-seminomas using the definition of the EUROCARE-5 study. As there is no direct link between the cancer diagnosis (in the BCR database) and the treatments found in the IMA data, time frames around the incidence date are used to select treatments:
	• A surgery is considered as related to the cancer if it occurs within 1 month before and 6 months after the incidence date
	• A treatment is considered to be adjuvant if it is given within 3 months after the date of surgery[5]

International comparability	N/A
Limitations	The BCR database does not have information on risk factors (i.e. rete testis invasion and tumour size in case of seminomas, vascular invasion in case of non-seminomas) readily available for patients with testicular cancer. Therefore it is not possible to identify the tumours with presence of risk factors. The calculated indicator on adjuvant treatment serves as a proxy for de ESMO clinical practice guidelines.[2] The BCR database does not have information on risk factors (i.e. rete testis invasion and tumour size in case of seminomas, vascular invasion in case of non-seminomas) readily available for patients with testicular cancer. Therefore, as it is not possible to identify the tumours with presence of risk factors, the calculated indicator on adjuvant treatment serves as a proxy for the ESMO clinical practice guidelines. In comparison, a Spanish publication from 2011 reported 47% rete testis invasion in stage I seminoma[6] and another publication reported 18% vascular invasion.[7]
Dimension	Quality, appropriateness
Related indicators	N/A
Reviewer	Lien van Walle (BCR)

1.1.2. Results

Belgium

Over the period 2004-2020, 6543 testicular tumours clinical stage I were studied (clinical stage I = localised tumour which can be surgically removed), diagnosed in 5530 patients.

Seminomas

Most Belgian patients diagnosed with a seminoma stage I (N=2952 tumours in 2894 patients) receive surgery as primary treatment (i.e. orchiectomy) (95.7%, N=2826 tumours in 2770 patients). Since the publication of the ESMO guidelines in 2013, surveillance is recommended following primary orchiectomy, especially in absence of certain histological risk factors (i.e. rete testis invasion and tumour size in case of seminomas) instead of adjuvant. The results show that during the period 2004-2012, the majority of the patients with stage I seminomas (72.3%) received an adjuvant treatment (i.e. chemotherapy or external radiotherapy), compared to only 45.2% for the 2013-2016 period, and 40.4% for the 2017-2020 period (Table 1). When looking at the proportion of patients receiving adjuvant external radiotherapy (with or without chemotherapy), there has been a remarkable decrease between the 2004-2012 period (29.3%) and the following periods (3.0% for the 2013-2016 period and 1.2% for the 2017-2020 period). The evolution is different when considering chemotherapy as adjuvant therapy (with or without radiotherapy): the observed decrease is rather modest (43.3% of the patients with a stage I seminoma received adjuvant chemotherapy during the 2004-2012 period, 42.2% during the 2013-2016 period and 39.2% during 2017-2020).

Non-seminomas

There were 2431 non-seminoma stage I testicular cancers (diagnosed in 2406 patients) included over the period 2004-2020; 94.3% (2292 cases) were treated with surgery (i.e. orchiectomy) as primary treatment.

The observed evolution in adjuvant treatment between the 3 periods in non-seminoma is smaller than for seminoma (Table 2): in 2004-2012, 67.3% of the operated patients received an adjuvant therapy compared to 59.2% in 2013-2016 and 55.1% in 2017-2020.

Regional comparison

Seminomas

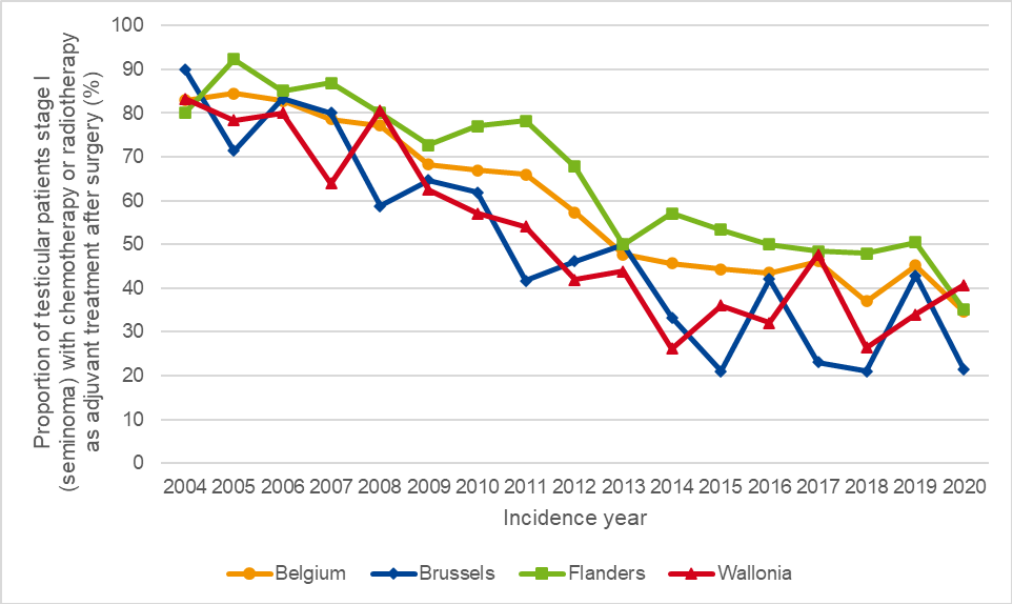
Regional variations are observed (Table 1), in 2017-2020 a quarter of the patients (25.1%) in Brussels received adjuvant treatment, compared to almost half of the patients in Flanders (45.5%) and about a third of patients (35.9%) in Wallonia; annual figures are presented in Figure 1.

Table 1 – Proportion of stage I testicular cancer patients (seminoma) treated with surgery who received adjuvant therapy (chemotherapy or radiotherapy)

Period	Belgium			Brussels			Flanders			Wallonia		
	N op	N adj	%	N op	N adj	%	N op	N adj	%	N op	N adj	%
Before ESMO guidelines (2004-2012)	1045	756	**72.3**	131	86	**65.7**	534	422	**79.0**	378	246	**65.1**
Shortly after ESMO guidelines (2013-2016)	657	297	**45.2**	68	24	**35.3**	376	198	**52.7**	213	75	**35.2**
After ESMO guidelines (2017-2020)	681	275	**40.4**	74	19	**25.7**	389	177	**45.5**	217	78	**35.9**

N op: number of patients with stage I seminomia with surgery, N adj: number of patients with stage I seminoma with an adjuvant treatment (chemotherapy or radiotherapy) after surgery. Source: Belgian Cancer Registry (BCR) , Intermutualistic Agency (IMA – AIM)

Figure 1 – Proportion of testicular cancer patients (stage I, seminoma) treated with surgery who received adjuvant treatment (chemotherapy or radiotherapy), by region (2004-2020)



Source: Belgian Cancer Registry (BCR) , Intermutualistic Agency (IMA – AIM)

Non-seminomas

There are regional variations, with the highest rate of adjuvant treatment observed in Flanders, followed by Wallonia, and the lowest rate in Brussels. The observed decrease of adjuvant treatment over time is of similar order of magnitude in the 3 regions (Table 2).

Impact of COVID-19 pandemic

It is too early to make a judgement.

Table 2 – Proportion of stage I testicular cancer patients (non-seminoma) treated with surgery who received adjuvant therapy (chemotherapy or retroperitoneal lymph node dissection) after surgery

Period	Belgium			Brussels			Flanders			Wallonia		
	N op	N adj	%	N op	N adj	%	N op	N adj	%	N op	N adj	%
Before ESMO guidelines (2004-2012)	731	492	**67.3**	92	53	**57.6**	422	304	**72.0**	217	135	**62.2**
Shortly after ESMO guidelines (2013-2016)	434	257	**59.2**	62	34	**54.8**	243	152	**62.6**	127	69	**54.3**
After ESMO guidelines (2017-2020)	461	254	**55.1**	50	24	**48.0**	293	170	**58.0**	118	60	**50.9**

N op: number of patients with stage I non-seminomia with surgery, N adj: number of patients with stage I non-seminoma with an adjuvant treatment (chemotherapy or radiotherapy) after surgery
Source: Belgian Cancer Registry (BCR) , Intermutualistic Agency (IMA – AIM)

Key points

- **Patients with early testicular cancer (stage I, localised cancer) have a primary surgical treatment (i.e. orchiectomy) which can be followed within 3 months by an adjuvant treatment or surveillance; since 2013, ESMO guidelines recommend surveillance after orchiectomy for stage I seminomas and non-seminomas rather than adjuvant treatment, especially in absence of risk factors; when comparing with the period before the publication of the guidelines (2004-2012), a clear decrease in proportion of adjuvant treatment has been observed for the 2013-2016 period (shortly after guidelines publication) and the 2017-2020 period (after guidelines publication) in case of seminoma, and to a lesser extent in case of non-seminoma; these trends are observed in all regions.**
- **Regional variation regarding adjuvant treatment for stage I testicular seminoma shows the highest rates for Flanders, both before (79.0%) and after (45.5%) the publication of new guidelines; Wallonia and Brussels had similar rates before publication of the 2012 guidelines (65.1% and 65.7%, respectively), but in Brussels the observed decrease after publication of the guidelines was more pronounced that in Wallonia (25.7%, and 35.9% respectively).**
- **Regional variation regarding adjuvant treatment for stage I testicular non-seminoma shows the highest rates for Flanders, followed by Wallonia and lastly Brussels, both before and after the publication of new guidelines.**

References

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