Incidence of second malignancies for prostate cancer

Mieke Van Hemelrijck[1], Anita Feller[2,3], Hans Garmo[1], Fabio Valeri[4], Dimitri Korol[4], Silvia Dehler[4], Sabine Rohrmann[5]

[1]King's College London, School of Medicine, Division of Cancer Studies, Cancer Epidemiology Group, London, UK; [2]Foundation National Institute for Cancer Epidemiology and Registration (NICER), Zurich, Switzerland; [3]Institute of Social and Preventive Medicine, University of Bern, Bern, Switzerland; [4]Cancer Registry Zurich and Zug, Zurich, Switzerland; [5]Institute of Social and Preventive Medicine, University of Zurich, Zurich, Switzerland

Introduction

The number of men living with prostate cancer (PCa) is growing rapidly. In Switzerland, the prevalence rate of PCa was estimated to be 580.5 per 100,000 in 2010, accounting for 45,421 men living with the disease. It is therefore of public health importance to assess the risk of second primary cancers in these men, especially since it is thought that PCa treatment may also be associated with an increased risk of second primary tumours.

Methods

- Study population: all men diagnosed with primary PCa between 1980 and 2010 in the canton of Zurich, Switzerland, as registered by the Cancer Registry Zurich and Zug (n=20,559)
- Analysis: calculation of standardized incidence ratios (SIRs; ratio of the observed numbers of primary tumours to the expected numbers) for second primary tumours comparing men diagnosed with PCa and the general male population in the Canton of Zurich

Table 1. Baseline characteristics of men with primary PCa in the canton of Zurich, Switzerland, 1980-2010.

	PCa men with second primary tumour (N=1,718)	PCa men without second primary tumour (N=18,841)
Age (years)	N (%)	N (%)
<65	328 (19.09)	4690 (24.89)
65-74	848 (49.36)	7228 (38.36)
75-84	480 (27.94)	5424 (28.79)
85+	62 (3.61)	1499 (7.96)
PCa Grade		
I	464 (27.01)	3260 (17.30)
II	788 (45.87)	8445 (44.82)
III	307 (17.87)	4987 (26.47)
IV	159 (9.25)	2149 (11.41)
Primary PCa Treatment		
Surgery	554 (32.25)	4827 (25.62)
Radiotherapy	179 (10.42)	1398 (7.42)
Androgen deprivation therapy	288 (16.76)	2906 (15.42)
Missing or Surveillance	697 (40.57)	9710 (51.54)
Year of diagnosis		
<1995	797 (46.39)	6723 (35.68)
1995+	921 (53.61)	12118 (64.32)

Figure 1. SIR and 95%CI (Y-axis) for all cancers occurring after PCa diagnosis by time (years) since time of PCa diagnosis stratified by treatment: surgery (blue), radiotherapy (red), and androgen deprivation therapy (green)

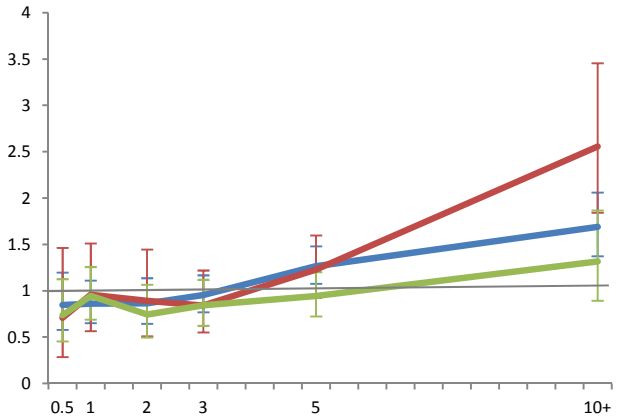

Table 2. Standardized Incidence Ratios (SIRs) and 95% confidence intervals (CI) for second primary cancer diagnosed after primary PCa diagnosis.

Type	Observed	Expected	SIR	95% CI
All	1718	1545.67	1.11	1.06-1.17
lip	42	31.45	1.34	0.96-1.81
oesophagus	32	20.81	1.54	1.05-2.17
stomach	70	53.59	1.31	1.02-1.65
colon	216	124.66	1.73	1.51-1.98
anus	78	55.54	1.40	1.11-1.75
liver	47	31.65	1.49	1.09-1.97
gallbladder	21	13.57	1.55	0.96-2.37
pancreas	79	46.12	1.71	1.36-2.13
lung	262	219.94	1.19	1.05-1.34
testis	2	1.87	1.07	0.12-3.85
kidney	86	35.70	2.41	1.93-2.98
bladder	197	94.26	2.09	1.81-2.40
melanoma	108	60.39	1.79	1.47-2.16
brain	27	16.22	1.66	1.10-2.42
thyroid	15	5.19	2.89	1.62-4.77
NHL	107	53.28	2.01	1.65-2.43
leukaemia	76	41.71	1.82	1.44-2.28

Results

- 1,718 men developed a second primary tumour after PCa diagnosis, with lung and colon cancer being the most common.
- SIR for overall second primary cancer was 1.11 (1.06-1.17).
- Increased SIR for urologic tumors (bladder, kidney, testis, penile cancers: 2.10, 1.87-2.35) and for insulin-like growth factor-related tumors (colon, rectum, thyroid, and haematological cancers: 1.36, 1.23-1.50).
- Stratification by time since PCa diagnosis showed a lower risk of cancer for men with PCa compared to the general population for the first four years, but then a steep increase in risk was observed.

Conclusion

- In the Canton of Zurich, there was an increased risk of second primary cancers among men with PCa compared to the general population.
- Increased diagnostic activity after PCa diagnosis may partly explain increased risks within the first years of diagnosis, but time-stratified analyses indicated that increased risks remained and even increased over time.

Correspondence: sabine.rohrmann@ifspm.uzh.ch