

Prostate cancer patient's survival in Lithuania

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Background. The aim of this study was to evaluate changes in the survival of prostate cancer patients during the 12-year period and to analyze differences in survival by period of diagnosis, stage of disease, age and place of residence.

Materials and methods. All newly diagnosed cases of prostate cancer (ICD-10, C61) in men were identified in the Lithuanian Cancer Registry for the period 1994–2005. Five-year relative survival estimates were computed with the Hakulinen method using the STATA software. Five-year relative survival estimates were calculated for three different periods of time when prostate cancer was diagnosed (1994–1997, 1998–2001 and 2002–2005), by age (15–59, 60–74, and 75–99), stage at diagnosis (I, II, III, IV, unknown) and place of residence (cities and towns or rural areas).

Results. The survival of prostate cancer patients in Lithuania has dramatically increased. Five-year relative survival in the period 1994–1997 was 46.92% and in the period 2002–2005 it reached 86.49%. Medium age prostate cancer patients (60–74 years) compared to younger and older patients had better survival rates. Increasing survival was observed for all stages of disease. Lower five-year relative survival rate of prostate cancer patients was reported for men from villages or other rural areas compared to patients from cities and towns in all periods under study.

Conclusions. The five-year survival rate of patients with prostate cancer has increased from 46.92% (95% CI 44.12–49.74) in 1994–1997 to 86.49% (95% CI 84.73–88.22) in 2002–2005 in Lithuania. The study identified survival differences by age and place of residence. Issues, such as access to care, quality of medical care, must be made equally available and accessible for the whole population with special attention to older men and men living in rural areas.

Key words: prostate cancer, relative survival

INTRODUCTION

Prostate cancer is the second most common cancer diagnosed among men (behind lung cancer), and

is the sixth most common cause of cancer death among men. By 2008, prostate cancer was estimated to have become the most commonly diagnosed malignancy in men in Europe, as well as in North and South America (1). In the recent analysis of prostate cancer incidence and mortality trends in European countries the highest ASR was reported in Finland and Sweden (154.9 and 153.9) for the period 2001–2005 (2).

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According to the EURO CARE studies survival varies greatly across Europe for common and rare malignancies (3–5). These variations can be explained by a number of factors, including differences in the quality of cancer treatment facilities, in screening programmes, in evidence-based best practice guidelines, in facilities for surgery and radiotherapy, and in access to new anticancer drugs.

Identifying differences in survival between population groups can help to uncover gaps in systemic policy and health care delivery, and support the planning of enhanced cancer control systems. The aim of this study was to evaluate changes in the survival of prostate cancer patients during the 12-year period and to analyze differences in survival by period of diagnosis, stage of disease, age and place of residence.

MATERIALS AND METHODS

All newly diagnosed cases of prostate cancer (ICD-10, C61) in men were identified in the Lithuanian Cancer Registry for the period 1994–2005. This analysis includes male patients diagnosed with malignant prostate tumors, excluding diagnoses confirmed by autopsy or a death certificate only.

Five-year relative survival estimates were calculated for three different periods of time when prostate cancer was diagnosed (1994–1997, 1998–2001 and 2002–2005), by age (15–59, 60–74, and 75–99), stage at diagnosis (I, II, III, IV, unknown) and place

of residence (cities and towns or rural areas). The survival duration of each case was determined as the time difference between the date of initial diagnosis and the date of death, date of loss to follow-up, or closing date for follow-up. Relative survival estimates were derived as a ratio of the absolute survival of the cancer patients divided by the expected survival of an age-matched group of the underlying male general population. The relative survival rates were calculated using the Hakulinen method with an algorithm written in STATA (StataCorp. 2009. Stata Statistical Software: Release 11.0. College Station, TX, USA) by Paul Dickman (6).

RESULTS

Table 1 displays the characteristics of prostate cancer patients included in the analysis by time of diagnosis. Data analysis included 12 005 prostate cancer cases. 2 306 prostate cancer diagnoses were made in 1994–1997, 3 337 in 1998–2001 and more than half – 6 362 diagnoses were made in the 2002–2005 period.

The highest overall five-year relative survival was estimated in the period 2002–2005 compared to the 1994–1997 and 1998–2001 periods (Table 2). Five-year relative survival in the period 1994–1997 was 46.92% and in the period 2002–2005 it reached 86.49%.

Medium age prostate cancer patients compared to younger and older patients had better survival

Table 1. Study group characteristics: distribution of patients with prostate cancer by period of diagnosis, stage of disease, age and place of residence

	1994–1997		1998–2001		2002–2005		Total	
	N	%	N	%	N	%	N	%
Overall	2 306		3 337		6 362		12 005	
Stage								
I	59	2.6	60	1.8	332	5.2	451	3.8
II	860	37.3	614	18.4	2 361	37.1	3 835	31.9
III	743	32.2	1 784	53.4	2 537	39.9	5 064	42.2
IV	508	22.0	676	20.3	751	11.8	1 935	16.1
not reported	136	5.9	203	6.1	381	6.0	720	6.0
Age								
15–59	190	8.2	302	9.0	549	8.6	1 041	8.7
60–74	1 273	55.2	1 791	53.7	3 622	56.9	6 686	55.7
75–99	843	36.6	1 244	37.3	2 191	34.5	4 278	35.6
Place of residence								
cities and towns	1 365	59.2	2 081	62.4	4 270	67.1	7 716	64.3
rural areas	941	40.8	1 256	37.6	2 092	32.9	4 289	35.7

Table 2. Five-year relative survival (%) of patients with prostate cancer by period of diagnosis, stage of disease, age and place of residence

	1994–1997	1998–2001	2002–2005
Overall	46.92 (44.12–49.74)*	61.81 (59.36–64.25)	86.49 (84.73–88.22)
Stage			
I	79.10 (59.45–96.10)	100.00 (86.66–117.55)	100.00 (98.00–117.24)
II	63.53 (58.61–68.39)	81.06 (75.29–86.54)	100.00 (99.00–107.51)
III	47.47 (42.51–52.50)	70.43 (67.02–73.78)	83.54 (80.65–86.35)
IV	15.82 (12.12–20.07)	17.56 (14.19–21.31)	26.85 (22.90–31.04)
not reported	42.78 (31.38–54.87)	61.98 (51.08–72.75)	78.70 (70.70–86.33)
Age			
15–59	37.75 (30.28–45.34)	55.70 (49.23–61.87)	83.33 (78.85–87.33)
60–74	48.30 (44.83–51.76)	65.00 (61.97–67.97)	87.58 (85.53–89.56)
75–99	47.03 (41.39–52.89)	57.02 (52.15–61.96)	84.62 (80.65–88.54)
Place of residence			
cities and towns	50.76 (47.08–54.45)	67.70 (64.61–70.75)	92.46 (90.38–94.48)
rural areas	41.11 (36.86–45.46)	51.60 (47.66–55.55)	73.76 (70.53–76.92)

* – 95% confidence intervals (CI) in parentheses

rates. The highest survival rates were within 60–74 years age group and in the period 2002–2005 reached 87.58%. In the period 1994–1997 in all age groups five-year relative survival was worse compared to other periods of time.

Increasing survival was observed for all stages of disease. All patients, those were diagnosed with Stage I prostate cancer in the 1995–1999 and 2002–2005 periods, and with Stage II in the 2002–2005 period, survived five years. In the period 1994–1997 relative survival was lower in all stages of disease.

Lower five-year relative survival rate of prostate cancer patients was reported for men from villages or other rural areas compared to patients from cities and towns in all periods under study. The best survival rate was estimated in the 2002–2005 period – 92.46% and it has almost doubled compared to the 1994–1997 year period. In rural areas survival rates were also increasing by diagnosis time (in 1994–1997 – 41.11% and in 2002–2005 – 73.76%).

DISCUSSION

Since the late 1980s and early 1990s, opportunistic screening for prostate cancer among asymptomatic men by means of prostate specific antigen (PSA) testing (7, 8) caused rapid rises in prostate cancer incidence as well as survival in many Western countries (9–12).

Comparative survival studies, such as the EU-RO CARE study of the last two decades, have shown that large between-country and within-country differences in survival were present in Europe, and survival was generally lower in Eastern European countries than elsewhere (13, 14). An analysis of more recent data has indicated a general pattern of lower survival in Eastern Europe (compared to all other regions), in spite of the observation that survival differences between European populations are narrowing (15). Survival differences between countries have been largely attributed to differences in patient's age, stage of disease at diagnosis, and the presence of metastasis.

Analysis of survival of patients diagnosed with prostate cancer in 12 European cancer registries between 2000 and 2004 showed the highest model-based age-adjusted five-year relative survival estimates in Saarland (93%) and Torino (92%), whilst substantially lower ones in Scotland, Lithuania and Estonia (around 75% in 2004), and the lowest survival estimates in Slovenia and Cracow, at 67% and 58%, respectively. Trends between 2000 and 2004 indicated rapid increases in survival in Lithuania from 47.0% to 74.1% (16). The rises in the five-year relative survival of prostate cancer patients have been described in other survival analyses (9–12).

Interpretation of survival rate differences is complicated by the increasing impact of PSA testing.

Increasing survival rates are becoming widespread, although it is not clear whether this is due to earlier diagnosis (PSA testing), improved treatment, or some combination of these or other factors (7). The use of the prostate specific antigen test in clinical practice for the early detection of prostate cancer has been rapidly growing in Lithuania in the years 2000–2004.

The difference between countries is most likely to be due to the use of PSA testing, which leads to earlier diagnosis of patients with asymptomatic metastasis, resulting in a seemingly better survival. However, it is not still clear to which extent PSA testing influences mortality rates. The decreasing mortality from prostate cancer observed in many countries may be attributed to improvements in the treatment and an effect of earlier detection by PSA testing (17, 18). Conflicting conclusions about the actual effectiveness of PSA testing in asymptomatic men were made in the recently published results of randomized trials from USA and Europe. The US trial demonstrated no benefit from PSA testing (19), though was widely criticized for high rates of PSA testing in the control arm. Whereas the European trial suggested that PSA testing reduced prostate cancer mortality by 20% (20) or even more if certain adjustments for non-compliance and contamination were made (21). The Goteborg randomised population-based prostate-cancer screening study showed a much higher mortality reduction through PSA testing than in previous studies (22), then the observation time is longer.

Dramatic increases in survival of prostate cancer patients are very likely mostly due to the increased lead time resulting from rapidly increasing use of the prostate specific antigen (PSA) test in European populations (23–25). Changes in the incidence of prostate cancer according to the clinical stages in Lithuania could reflect the mainstream clinical practice. Up to 2006 opportunistic screening of prostate cancer by PSA test and digital rectal examination was the standard. The proportion of Stage III cases has increased in 1998–2001 not only due to PSA test, because androgen deprivation therapy was supported by funding authorities and became the most popular management form in combination with radiotherapy. Since 2000 the number of radical prostatectomy started to grow and together with more aggressive PSA testing resulting in high-

er proportion of Stage II cases in 2002–2005. Having in mind the observation period not shorter than 9 years needed to report on survival in the group of localized prostate cancer, situation in Lithuania should be closely monitored as even more dramatic changes in incidence of prostate cancer were reported after introduction of the Lithuanian Early Prostate Cancer Detection Program (26). Also advances in hormonal therapy could have contributed to real improvements in patients' five-year survival (27, 28). We hypothesize that the increasing survival observed in prostate cancer patients is influenced by both policy and practices regarding diagnosis and treatment of prostate cancer patients in Lithuania.

CONCLUSIONS

The five-year survival rate of patients with prostate cancer has increased from 46.92% (95% CI 44.12–49.74) in 1994–1997 to 86.49% (95% CI 84.73–88.22) in 2002–2005 in Lithuania. Earlier prostate cancer diagnosis and improved treatment enable to record survival accretion.

The study identified survival differences in prostate cancer patients by age and place of residence. Issues, such as access to care, quality of medical care, must be made equally available and accessible for the whole population with special attention to older men and men living in rural areas.

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SUSIRGUSIŲJŲ PROSTATOS VĖŽIU IŠGYVENAMUMAS LIETUVOJE

Santrauka

Įvadas. Šio tyrimo tikslas buvo įvertinti susirgusiųjų prostatos vėžiu 12 metų išgyvenamumo pokyčius ir išnagrinėti išgyvenamumo skirtumus pagal diagnozės nustatymo laikotarpį, nustatytos ligos stadiją, paciento amžių ir gyvenamąją vietą.

Medžiaga ir metodai. Visi 1994–2005 m. diagnozuoti prostatos vėžio (TLK-10, C61) atvejai buvo gauti iš Vėžio registro duomenų bazės. Penkerių metų reliatyviojo išgyvenamumo rodikliai nustatyti naudojant *Hakulinen*

reliatyvaus išgyvenamumo modelį. Skaičiavimai atlikti statistinės analizės programa STATA. Išgyvenamumas vertintas trimis diagnozės nustatymo laikotarpiais (1994–1997, 1998–2001 ir 2002–2005) pagal amžių (15–59, 60–74 ir 75–99 metų), ligos stadiją (I, II, III, IV, nenurodyta) ir gyvenamąją vietą (miestai ir miesteliai ar kaimai).

Rezultatai. Susirgusiųjų prostatos vėžiu išgyvenamumas Lietuvoje ženkliai padidėjo. Susirgusiųjų 1994–1997 m. penkerių metų išgyvenamumo rodiklis buvo 46,92 %, o susirgusiųjų 2002–2005 m. jau pasiekė 86,49 %. Geriausi išgyvenamumo rodikliai nustatyti 60–74 metų amžiaus prostatos vėžiu susirgusiųjų grupėje. Nustatytas didėjantis išgyvenamumas sergant visų stadijų prostatos vėžiu. Visu tyrimo laikotarpiu kaimo gyventojams buvo būdingi mažesni išgyvenamumo rodikliai, palyginti su miestų ir miestelių gyventojais.

Išvados. Susirgusiųjų prostatos vėžiu 1994–1997 ir 2002–2005 metais išgyvenamumas Lietuvoje padidėjo nuo 46,92 % iki 86,49 %. Tyrime nustatyti susirgusiųjų prostatos vėžiu išgyvenamumo skirtumai pagal amžių ir gyvenamąją vietą rodo sveikatos priežiūros paslaugų ir kokybės suvienodinimo būtinybę visiems Lietuvos gyventojams, ypač vyresnio amžiaus ir gyvenantiems kaimuose.

Raktažodžiai: prostatos vėžys, reliatyvusis išgyvenamumas