

consequences has been registered last years. High level of chromosome aberrations in somatic cells can be considered as biomarker of cancer risk and therefore cytogenetical studies of radiation-induced chromosomal damages are actual today.

Materials and methods: Radiation epidemiology methods and metaphase analysis of radiation-induced aberrations in chromosomes of peripheral blood lymphocytes (PBL) of liquidators were used.

Results: It was established that in the group of liquidators (17000 persons) with documented doses of irradiation cancer takes the fourth place in the structure of case rates. Tumors of digestion system (33.7%) occupy the first place among cancer cases, lung cancer (25.3%) takes the second place and genitourinary cancer (13.1%) – the third. Analysis of the information significance of the character of work fulfilled by the liquidators has shown that sarcophagus treating, transport driving, deactivation of territories and evacuation of the population were the most dangerous factors in the origin of cancer. All dates of the entrance in accident zone since April 26, 1986 are the factors of cancer risk and the tendency of the risk increasing (in time) was observed. The inverse dependence of the frequency of cancer formation and level of irradiation was shown: the highest values are registered at low doses (1–5 cGy). Cancer frequency decreases with the increase of the irradiation dose (up to 85 cGy).

Cytogenetical study showed that correlation coefficients of radiation markers (dicentric and centric rings) and dose of exposure were 0.59 and 0.56 respectively. They essentially exceeded relevant coefficients in groups with other pathologies. This fact testifies to the conservation of the dependence (dose-effect) for radiation cytogenetical markers in the remote periods (10–15 years) among the liquidators with cancer. Results obtained show that low levels of absorbed radiation represent statistically significant factors of cancer risk. It is shown that frequency of chromosome fragments and chromatid aberrations in PBL are the most informative parameters in the formation of groups of high cancer risk.

Conclusions: The correlation between degree of radiation effects, cytogenetical data and case rates at the liquidators of the Chornobyl accident is established.

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POSTER

Half of the treatment costs for fatal breast cancer accrue during the last year of life: results from the Turku screening programme

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Background: The aim of the study was to assess the treatment costs due to fatal breast cancer spent in the course of the last year of life during population based mammography screening.

Material and methods: Population based mammography screening for women aged 40–74 years in the city of Turku, Finland was launched in 1987. The current study included 556 invasive breast cancers diagnosed among women aged 40–74 years between 1987 and 1993: 427 in the screening group (which included screen-detected and interval breast cancers) and 129 in the non-screening group (which included breast cancers detected before initial screening and those detected in patients who chose not to undergo screening). The numbers of inpatient days and outpatient visits due to breast cancer for each patient were followed up until the end of the year 2001, or until death, whichever occurred first. Treatment costs were based on the average costs calculated for inpatient days and outpatient visits at the different hospitals, in a hospice and at a cancer clinic of the Cancer Society.

Results: During a median follow-up of 10 years, 96/556 women died of breast cancer, 58/427 (13%) in the screening group and 38/129 (29%) in the non-screening group, while 50/427 (12%) versus 23/129 (18%) died of other causes, respectively. Median survival from diagnosis to death was 3.9 years for those who died from breast cancer. Hospital was the most common place of death: 28 (29%) patients died at the University Hospital, 29 (30%) at the City Hospital, 32 (33%) in a hospice and 7 (7%) at home. In the 96 patients who died of breast cancer, 52% (Euros 1,383,000/2,646,000) of the treatment costs were spent during the last year of life. The mean treatment costs during the last year of life were Euros 14,405 (95%CI: 12,271–16,540) per patient: 15,915 (CI: 12,855–18,976) in the screening group versus 12,101 (CI: 9,405–14,796) in the non-screening group ($p = 0.063$). Inpatient care accounted for 81% of the total costs during

the final year, 65% of these costs being incurred at the University Hospital, 18% at the City Hospital and 17% at the hospice. Costs were highest during the last three months before death (Figure 1).

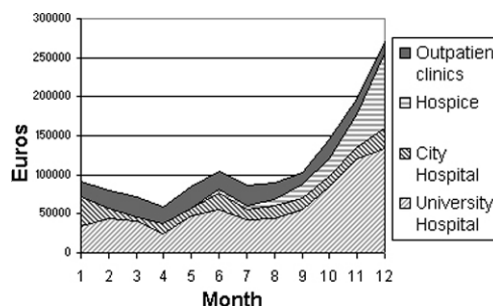


Fig. 1

Conclusions: For those who died of breast cancer half of the treatment costs accrued during the last year of life and the costs were highest during the last three months. The costs were substantial and of the same order of magnitude irrespective of the screening status.

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POSTER

Long-term risk of cardiovascular disease in 5-year survivors of testicular cancer

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Background: To assess long-term risk of cardiovascular disease (CVD) in 5-year survivors of testicular cancer (TC).

Patients and methods: We conducted a nation-wide cohort study comprising 2,512 men who were treated for seminomatous or nonseminomatous TC between 1965 and 1995 and had survived for at least 5 years. Information on CVD was available for 93% (N = 2339) of the survivors. We evaluated CVD risk by calculating standardized incidence ratios (SIRs) and absolute excess risks (AERs) based on comparison with general population rates. Multivariate Cox regression analysis was used to quantify treatment effects on CVD risk.

Results: After a median follow-up of 18.4 years, 694 cardiovascular events were observed, including 141 acute myocardial infarctions (MIs). The SIR for MI and angina pectoris combined was 1.17 (95%CI: 1.04–1.31), with an AER of 14 excess cases per 10,000 person-years. The SIR of MI following treatment with chemotherapy and radiotherapy was elevated 2.06 (95%CI: 1.17–3.35). The SIR of MI was 1.00 (95%CI: 0.80–1.23) following RT alone and 1.46 (95%CI: 0.91–2.21) following chemotherapy alone. In nonseminoma patients the risk of MI was increased in survivors with attained ages ≤ 45 and 45–54 years, with SIRs of 2.06 (95%CI: 1.15–3.41) and 1.86 (95%CI: 1.20–2.74), respectively, while the SIR decreased to 0.53 (95%CI: 0.25–0.98) for survivors aged 55 years or older. Cox models showed that mediastinal irradiation was associated with 3.7-fold (95%CI: 2.2–6.2) increased risk of MI, while infradiaphragmatic irradiation only was not associated with increased risk of MI, compared with surgery alone. PVB chemotherapy was associated with 1.9-fold (95%CI: 1.7–2.0) increased risk, while BEP chemotherapy was not associated with increased risk of MI, compared with surgery alone. Recent smoking was associated with 2.6-fold (95%CI: 1.8–3.9) increased risk of MI.

Conclusion: Survivors of nonseminomatous TC have a moderately increased MI risk at young ages. So far, no increased risks of CVD were observed after BEP chemotherapy. Mediastinal radiotherapy, PVB treatment, and recent smoking are important risk factors for CVD in TC survivors. Especially in young TC survivors with these risk factors, physicians should consider appropriate risk reducing strategies such as treatment of hypertension and hypercholesterolemia, and lifestyle advice to refrain from smoking, to maintain a healthy body weight and to exercise regularly.