1207 POSTER

Does cancer affect the divorce rate?

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Background: Cancer strikes the population in developed countries heavily. In Norway, between one-third and one-half of the population will ever be diagnosed with a malignant disease, and one-fourth of the deaths are reckoned as due to such diseases. Society's efforts are naturally directed towards improvements in cancer treatment and care, as well as prevention. Survival is, of course, the key issue for a cancer patient and his or her family. However, the quality of life among those who are about to fight the disease, or those who have apparently won the battle and survived, is also a legitimate concern. How are cancer survivors' chances of finding a spouse or partner, becoming parents, or having more children? Will their marital relationships take a turn for the better or worse? Knowledge of common responses may help individual patients and families plan their lives, and serve as an important basis for any societal attempts to assist. Our analyses explore how various cancer forms affect the probability of divorce in Norwegian couples. A malignant disease is an example of a completely unforeseen event that may change a marital relationship in many different ways, with a total impact that could go in either direction. We have not been able to find register-based studies of the probability of divorce following cancer illness, and our results may therefore be an important contribution in this field.
Materials and Method: Discrete-time hazard regression models were employed to register and census data on 1.4 million Norwegian married couples from 1974–2001 to explore the probability of divorce following cancer illness. Divorce rates for around 215 000 persons diagnosed with cancer were compared to divorce rates in otherwise similar persons (gender, age, period, educational level, number of children, and duration of marriage).
Results and Conclusions: No overall harmful influence of a cancer diagnosis was observed. Most cancer forms resulted in small, immediate declines in divorce rates the first years following diagnosis. Exceptions were a significant 40% increase in divorce probability for women diagnosed with cervical cancer, and a 20% immediate increase for men diagnose with testicular cancer. Cervical and testicular cancers are illnesses encountered relatively early in adult life. At the same time, they are closely linked to intimacy and sexuality. Further research is needed to better understand the reason for the increased divorce risks seen for survivors of these cancer forms.

1208 POSTER

Age variation in cancer avoidability among European adults

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Introduction: Of the 1.4 million adult cases of major cancers in Europe, 50% could be potentially avoided. In this study we examined the proportion of avoidable cancers by age-group hence giving insight on causes of cancer and its preventability.
Methods: We estimated the potential in avoidable numbers and proportions of 11 cancers amenable to prevention (cancers of the oral cavity, oesophagus, stomach, colorectal, pancreas, laryngeal, lung, female breast, endometrium, kidney and bladder) in 28 European countries. We assumed that the aggregated rate of 3 countries with lowest incidence to be attainable throughout Europe. The difference between the age- and gender-specific national cancer incidence rates and the lowest rate observed in 2002 was determined and defined as "avoidable".
Results: Of the 684,000 adult male cases of selected cancers and countries within our study, 17,400 (74%), 53,800 (67%), 98,400 (60%) and 234,300 (56%) cases for males aged 15−44, 45−54, 55−64 and 65+, respectively, were hypothetically avoidable. The corresponding numbers for females were 24,900 (49%), 52,500 (50%), 71,900 (51%) and 212,700 (54%) of 687,000 female adult cases. Although the number of avoidable cases was largest in the oldest age group (447,500 cases among those aged 65 years or more), the younger age groups (15−44 and/or 45−54 years) harboured the highest relative proportions of avoidable cancers, 74% and 67% in males and 63% and 57% in females (excluding breast cancer), respectively. Among the younger age group, smoking-related cancers, such as oral cavity, larynx, lung and bladder cancer, exhibited the highest proportion of avoidability, ranging from 65% to 86%. Furthermore, we also observed a large variation in avoidable cancers for colorectal cancer among men, ranging from 81%, 52%, 54% and 52% for males aged 15−44, 45−54, 55−64 and 65+, respectively. This contrasts the observation for the female colorectal cancers where age variation in cancer avoidability was small.
Discussion: Cancer incidence among younger adults may be related to higher cancer susceptibility and its interaction with risk-increasing factors may be reflected in shorter latency times. In the excess of the smoking-related cancers adolescent exposure to smoking must play an important role. Hence early behavioral intervention is at utmost importance to reduce a large proportion cancer in all age groups including a significant proportion of cancers among the younger adults.

1209 POSTER

Dietary micronutrients in prediagnostic blood and survival from breast cancer

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Background: Little is known regarding how prediagnostic levels of circulating micronutrients (total cholesterol, retinol, retinyl palmitate, alpha-tocopherol, gamma-tocopherol, lutein, beta-cryptoxanthin, lycopene, alpha-carotene, beta-carotene and total carotene) affect survival of women subsequently diagnosed with breast cancer.
Material and Methods: 292 white women from either the CLUE I or CLUE II cohorts diagnosed with first incident breast cancer between 1975 and 1994 was followed up through October 2001. CLUE I and II cohorts were established in 1974 and 1989, respectively, when volunteers in Washington County Maryland donated a blood sample to establish a research specimen bank. Out of 165 observed deaths, 63 were due to breast cancer. Cox proportional hazard models were used to estimate relative risks (hazard ratios HR) of breast cancer death associated with fourths of each micronutrient. Dummy variables were used to compare risk in second, third and upper fourths to the lowest fourth (based on cutpoints determined separately for 1974 and 1989 cohorts). Models were adjusted for age and cancer stage at diagnosis. Additional adjustment for other potential confounders (time between blood draw and diagnosis, hormone receptor status, cigarette smoking, marital status, menopausal status, age at first live birth, age at menarche, number of months lactation, family history of breast cancer, estrogen replacement therapy use, oral contraceptive use, and alcohol consumption) did not substantially change relationships between survival and micronutrient levels.
Results: No statistically significant associations between risk of dying and micronutrients concentration were found. However the HR estimates are suggestive of decreasing breast cancer mortality risk with increasing of pre-diagnostic beta-cryptoxanthin concentration (unadjusted and adjusted HR were 0.98, 0.78, 0.61; and 0.90, 0.67, 0.60 respectively). The dose dependant relationship, nonetheless, was not significant (p for trend=0.14 for unadjusted and p = 0.153 for adjusted).
Conclusions: We did not observe any strong association between ten measured micronutrients and survival from breast cancer. Week inverse association between risk of dying and beta-cryptoxanthin concentration raise the necessity of further researches which may clarify whether the dietary habits affect breast cancer progression in all stages.
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1210 POSTER

Delay in cancer diagnosis – is there a problem?

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Background: Delay in cancer diagnosis is the period between the patient's first cancer symptoms and onset of treatment and can be divided into patient delay, doctor delay and system (hospital) delay. A short diagnostic delay is a prerequisite for a better cancer prognosis. However, there is only little knowledge about the duration of and factors associated with diagnostic delay.
Materials and Methods: We conducted a cohort study in the County of Aarhus and included all newly diagnosed cancer patients during a 1-year period (about 3000 patients). Data were collected from administrative health care databases, hospital medical records and patient and general practitioner questionnaires (dates of diagnostic investigations, patient symptoms, specific patient and GP characteristics and GP-patient relationship).
Results: The median total delay was 100 days [95% CI: 95;105]. 25% of the patients experienced a median total delay of 173 days. Patient and system delay accounted for most of the delay (median 21 [21;28] and 57 days [55;60]). The median doctor delay was 0 days [0;0], but with

long delays corresponding to the 4th quartile of patients. Patients with ovarian and breast cancer experienced the shortest total delay (median 60 [50;89] and 65 days [52;74]) while patients with bladder and prostate cancer had the longest total delay (median 126 [98;159] and 136 days [120;181]). Associations between specific patient and GP characteristics (e.g. socio-demographic factors, risk factors, social network, GP-patient relationship, coping style, mental health, practice type and organization, GP continuing education, GP job satisfaction) and the different delay stages will be presented.
Conclusions: This study showed that patient and system delay account for the major part of the delay in cancer diagnosis, but in all stages many patients had unacceptably long delays. Hence, interventions should be tailored to improve each delay stage. Further research is needed in relation to patient, GP and system characteristics associated with delay.

1211 POSTER

Temporal trends in age-specific incidence and mortality of breast cancer in 38 countries

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Background: Since 1985 considerable changes in breast cancer detection and management have occurred. We quantified temporal trends in breast cancer incidence and mortality in 38 European, North American and Asian countries.
Materials and Methods: Joinpoint regression was used to analyse in a systematic manner incidence data from 31 countries and mortality data from 38 countries.
Results: Since 1960, steep increases in incidence often in the order of 2 to 4% per year occurred in all countries, mainly in the 50−69 age group whose incidence often came close or surpassed the incidence in women $\geqslant$70 years old. In most countries mortality started to decrease between 1985 and 1995 about simultaneously in all age-groups. Between 1990 and 2002, decreases in mortality of more than 20% were observed in Australia, Austria, Canada, England and Wales, Scotland, Spain, Switzerland and the United States while decreases of less than 10% were observed in Belgium, Bulgaria, Denmark, Finland, France, Greece, Hungary, and Poland. Decreases were more pronounced among 35−49 years old women. After 2000, mortality continued to increase in several Eastern European countries, in Korea, Japan and Singapore.
Conclusions: While increases in breast cancer incidence mainly concerned women 50 years old and more, decreases in mortality were more marked in women 35−49 years old. Disparities in changes in mortality rates probably reflect differences in detection and management with lower economic resources being another cause in some Eastern European countries. In Asian countries, increases in mortality paralleled increases in incidence, reflecting strong modifications in underlying risk factors.

1212 POSTER

Testicular germ cell tumour and testicular microlithiasis; a familial association?

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Background: Testicular Germ Cell Tumour (TGCT) is the most common cancer in men aged 15−45 years. Family history (FH) is a strong risk factors for TGCT with relative risk to brother of case 8−10, higher than for most other cancer type, and suggests that predisposition genes are important in this disease. Other risk factors include previously diagnosed germ cell tumour, a history of undescended testis (UDT), infertility, atrophy, and gonadal dysgenesis. Testicular microlithiasis (TM) is the presence of multiple small deposits of calcium within the testis. It shows characteristic sonographic findings of multiple, intratesticular, nonshadowing echogenic foci. A number of studies have reported an association between TGCT and TM and individuals with testicular germ cell tumour (TGCT) have a higher frequency of TM than men without TGCT. We have undertaken a prospective cohort study to investigate the relationship between TM and susceptibility to TGCT.
Methods: As part of a wider study to evaluate testicular abnormalities; TGCT patients with and without a family history of disease, an unaffected male relative and healthy male controls were recruited and underwent testicular ultrasounds on all testes available. TM was counted and classified into five groups.
Results: Ultrasound data were analysed from 328 men; 169 (51.5%) had a history of TGCT (41 with a FH), 58 (17.7%) were unaffected male relatives of TGCT cases and 101 (30.8%) were healthy male controls. TM was more frequent in TGCT cases than controls (36.7% vs 17.8%, age adjusted $p < 0.0001$) and in unaffected male relatives than controls (34.5% vs 17.8%, age adjusted $p = 0.02$). There was some evidence of a higher frequency of TM in patients with a FH of TGCT compared with patients with no FH (18/41, 43.9% vs 44/128, 34.4%, age adjusted $p = 0.3$). and in men with two or more relatives with TGCT than men with only one affected relative [11/24 (45.8%) vs 9/34 (26.5%) age adjusted $p = 0.1$). TGCT case and matched relative pairs showed greater concordance for TM than would be expected by chance ($p = 0.05$). This association is similar in both sib and non-sib first degree relatives suggesting shared environment is unlikely to be responsible for this association.
ConclusionsWe demonstrate that TM is not only more frequent in TGCT cases than controls, but importantly show that TM is more frequent in unaffected male relatives of TGCT cases. This would suggest that genetic factors which predispose to TGCT may also predispose to other testicular abnormalities such as TM and hence TM may a common genetic susceptibility to TGCT. This may have implications for mapping and identification of TGCT genes.

1213 POSTER

Tamoxifen adherence and its relationship to mortality in women with breast cancer

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Background: Tamoxifen remains a key adjuvant therapy in breast cancer. While the duration of tamoxifen therapy on survival has been studied relatively little is known about the effect of adherence to tamoxifen. This study investigated whether women prescribed tamoxifen as adjuvant therapy for breast cancer collected their medication from pharmacies and whether adherence to prescribed tamoxifen influenced survival.
Materials and Methods: A retrospective cohort was derived from record linkage of existing clinical and administrative databases for all women with incident breast cancer in Tayside, Scotland between 1993 and 2002. Encashed prescription records were used to calculate adherence to Tamoxifen. Clinical audit and cancer registry records were used to define characteristics of the presenting tumour. Hospital admission and co-prescribing records were used to define co-morbidity. Socio-economic status was also assessed for all patients. Survival analysis was used to determine the effect of the co-variates on all-cause mortality.
Results: There were 2,080 patients in the study cohort of whom 1,633 (79%) patients were prescribed tamoxifen as adjuvant therapy. The median duration of tamoxifen therapy was 2.42 years (interquartile range = 1.04−4.89 years) and the median adherence to Tamoxifen was 93% (interquartile range = 84–100%).
Adjusting for all factors, increasing age, increasing tumour grade, positive or unknown pathological node status and negative or unknown oestrogen receptor status increased the risk of death. A Charlson Index score of 6 or more also increased the risk of death, hazard ratio = exp (0.17 + 0.17∗time). Increased duration of Tamoxifen use was associated with better survival, hazard ratio = exp (−0.058∗time). Poor adherence of less than 80% showed an increased hazard ratio approaching significance at the 0.05 level [hazard ratio = exp (0.03∗time), $p = 0.084$]. Changing the cut-off for poor adherence to below 70% suggested that survival began to reduce [hazard ratio = exp(0.06∗time), 95% CI 0.02−0.10, $p = 0.009$].
Conclusions: This study confirms that tamoxifen use and increased duration of therapy reduces the risk of death from breast cancer. Adherence to Tamoxifen is high but there are a significant proportion of women with lower adherence who are at greater risk of death.