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EDITORIAL

Cancer survivorship and work loss – what are the risks and determinants?

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Cancer survivorship is a field of growing clinical and scientific interest. Two circumstances logically contribute to this development; a general increase in cancer incidence, and an improved cancer survival [1,2], both leading to a higher prevalence of cancer survivors. In the European Union in 2012, the number of individuals diagnosed with cancer within the past five years totaled 7.2 million [3]. In this context, it has been stressed that the challenge in overcoming cancer is not only to find efficient therapies for the disease, but also to minimize its medical and social hazards [4,5]. Although cancer is more likely to occur among the elderly, a considerable number of people will be affected in their working ages, with potential consequences for work ability, self-identity and living conditions for the individuals and their families, but also for society. Investigations of risk of work loss among cancer patients therefore shed light on important aspects of cancer care and rehabilitation. The current issue of Acta Oncologica features two large and comprehensive register-based studies of patients with hematological malignancies [6] and colorectal cancer [7], showing significantly increased risks of sick leave and disability pension among patients compared to matched population groups, which persists for several years after diagnosis. These studies call for increased awareness and better tools among cancer care givers to deal with long-standing sequelae manifesting through reduced work ability. The studies also raise additional questions regarding the underlying reasons for work loss and how to prevent it.

Already in the 1970s and 1980s, studies of labor force participation in young adult cancer patients with a favorable prognosis (mainly Hodgkin lymphoma) [8] indicated a considerable long-standing work impairment among survivors. However, these older studies showed disparate results, and relied on cross-sectional designs and self-reported data without comparison to the general population, limiting the generalizability of the findings (reviewed in [8]). Also, given the considerable modifications in treatment schedules for Hodgkin lymphoma patients [9], results are difficult to apply today. In the 21st century, several studies of work ability in patients with different cancer types compared with reference individuals have been performed [10–13]. Importantly, the results indicate that the majority of cancer survivors are able to continue working after diagnosis, but that a subgroup of the patients suffer from impaired health leading to work constraints and sometimes even permanent work disability. Although large numbers have been assembled, analyses of cancer patients overall [10,12,13], as well as cancer-specific studies [14,15], have so far mainly provided insight for patients with common cancer forms, such as breast and prostate cancer. This is further exemplified by the prospective questionnaire-based study of prostate cancer patients treated with radiotherapy and short-term return to work by Dahl et al. [14], also published in the current issue of Acta Oncologica. In view of large variations in cancer treatments, prognosis and clinical course, as well as age and sex distributions, the extent of sick leave and disability pension during follow-up could be expected to vary greatly by cancer type [10,12,13], and thus remains to be robustly assessed for large groups of patients by specific cancer diagnoses.

In this issue, Horsboel and colleagues report on the risk of disability pension among individuals

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diagnosed with hematological malignancies including acute and chronic myeloid leukemia, multiple myeloma, Hodgkin lymphoma and non-Hodgkin lymphoma subtypes [6]. Horsboel et al. have assembled a cohort of more than 3000 patients diagnosed in Denmark 2001 to 2007, and compare the patients with close to 30 000 age- and sex-matched comparators from the general population. Prospectively registered data on disability pension during a median follow-up of six years was retrieved from administrative authorities. Risk of disability pension varied by type of hematological malignancy and ranged from 2.6-fold increased among patients with Hodgkin lymphoma to more than 12-fold increased among patients with multiple myeloma. As discussed by the authors, the differences in risk by hematological malignancy subtype may be explained by the large variation in clinical course and prognosis, myeloma being a chronic progressive disease with essentially no possibility of cure [16], whereas the cure rate among young patients with Hodgkin lymphoma in the 21st century approaches 90% [9]. The authors further considered a range of personal and socioeconomic factors, and use of antidepressants or anxiolytics after diagnosis, as determinants of disability pension, and found that such effect modifying factors were less important among the cancer patients than in the population. Taken together, the results plausibly indicate that cancer treatment and progression/relapse are important drivers in risk of disability pension among hematological malignancy patients, although more detailed information about such clinical determinants was not available in this study.

The study by Hauglann et al., also presented in this issue [7], investigates colorectal cancer survivors. They report on risk of sick leave and disability pension among 740 patients with colorectal carcinoma diagnosed 1992–1996 in Norway, and compare with a matched population group of the same size. Maximum follow-up after diagnosis was 14 years. Among employed individuals, an increased likelihood and duration of sick leave was noted during the first $2-3$ years following diagnosis, but not thereafter. Patients with regional or distant disease at diagnosis were more likely to be sick-listed than patients with localized disease. The rate of disability pension was also elevated in all patient groups compared with the population sample, and ranged from an increase of approximately 1.7-fold among patients with localized disease to 10-fold among patients with distant disease at diagnosis. Among the patients, rates of disability pension varied by education level, employment at diagnosis and pre-diagnostic sick leave, as well as number of children in the household. Clinical information beyond stage, such as treatment and relapse was not available. In a previous report of cancer patients overall, a three-fold increased risk of sick leave and disability pension combined was observed among rectal cancer patients compared with the population, although follow-up did not extend beyond the first year post-diagnosis [13]. In two previous studies of work loss specifically among colorectal cancer patients [17,18], higher degrees of sickness absence [17] and labor force departures [18] were observed among stage III patients compared with patients diagnosed in stage I and II, as well as among patients with lower education level and income [17].

The current studies by Horsboel et al. and Hauglann et al. provide excellent insight into the burden of decreased work ability and permanent work loss/disability pension among patients with colorectal cancer and hematological malignancies compared with the population, and indicate a long-standing social impact for subgroups of these patients that should be recognized by care givers at the oncology/hematology as well as at the primary care levels [19]. Strengths of both studies include large sample size, population-based setting, the use of a relevant comparison group, and of prospectively recorded work loss data reducing the risk of selection and reporting bias. Additional assets were the ability to address effect modifying factors such as education level, sick leave and unemployment prior to diagnosis. The generalizability of these findings to other countries may be questioned since the extent of work loss granted to patients is heavily dependent upon the generosity of national systems of welfare and social security. While the absolute proportions of patients on sick leave and disability pension will be heavily dependent on the generosity of the system, the validity of the relative comparison of patients to a reference population where both groups reflect the same social security system will not be affected. Therefore, the findings reported herein, of an increased risk of work loss among subgroups of cancer survivors compared to population samples, is likely to be valid at least for other affluent countries.

The usefulness of studies of work ability among cancer survivors may be viewed from different perspectives. In terms of health economics, the study results serve the purpose of providing estimates of the total burden of work loss following a cancer diagnosis. In terms of guidance for cancer rehabilitation efforts, the results suggest channeling of interventions by cancer stage at diagnosis and clinical course, as well as by socioeconomic predictors. However, so far, available studies provide limited insight into potential associations with specific treatments and treatment complications among patients not experiencing cancer progression or relapse. In the presence of cancer progression and/or relapse, an

improvement of work ability may not always have high priority. In the absence of relapse, an increased risk of work loss may be viewed as a proxy for severe side effects of treatment, as in the study by Dahl et al. [14], which potentially could be prevented. Therefore, a key question to address in the future is to what extent the reported increased risks of sick leave and disability pension among patients with hematological and colorectal malignancies can be attributed to cancer relapse followed by salvage or palliative therapy, or to preventable treatment toxicity in patients likely to have been cured. In view of the growing number of cancer survivors worldwide, this research area should receive high priority.

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