In Sickness and in Health: the Role of Marital Partners in Cancer Survival

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Abstract

Cancer mortality is associated with marital status, with married persons having a survival advantage relative to others. Underlying mechanisms appear unclear, but some research suggests that persons with partners have better general health at diagnosis which is favorable for tolerating cancer treatment and thus prolongs survival, that having a partner is associated with earlier contact with health personnel in general and when one suspects something is wrong, and that having a partner at time of diagnosis will help ensure more optimal treatment and follow-up care, which in turn affects survival positively. All these suggested mechanisms invoke the mere presence of partners, but it is likely that partners bring varying amounts of resources into the household and that these resources of various types may produce differentials in survival net of own resources.

The present study examines the role of marital partners' sociodemographic characteristics for cancer survival. Data on complete birth cohorts were obtained from the Cancer Registry of Norway, with other variables linked from different national registers through personal identification numbers. Data on the patients' spouses at time of diagnosis were linked through unique family numbers. Altogether, more than 280,000 patients diagnosed with their first cancer after age 50 during 1975-2008 were included. We studied gross differences in survival by partners' education and age. Next, we assessed the impact of these partner characteristics net of stage differences at diagnosis and other illness characteristics. Lastly, we simultaneously studied the impact of the resources of patients and their partners.

Our results clearly indicate that partners' characteristics matter for survival. The relative survival of patients with highly educated partners, net of their own education, is significantly higher than that of patients with lesser-educated partners. Thus, the naïve perspective of only considering the presence of partners will conceal important differences in survival among cancer patients.

Introduction

It is well known that cancer mortality is associated with marital status, with married persons having a survival advantage relative to others (Fossa et al., 2011;Kravdal and Syse, 2011;Kravdal, 2001;Pinquart and Duberstein, 2010). Underlying mechanisms appear unclear, but some research suggests that persons with partners have a better general health at diagnosis which is favorable for tolerating cancer treatment and thus prolongs survival, that having a partner is associated with earlier contact with health personnel in general and when one suspects something is wrong, and that having a partner at time of diagnosis will help ensure more optimal treatment and follow-up care, which in turn affects survival positively (DiMatteo, 2004;Kravdal, 2000). All these suggested mechanisms invoke the mere presence of partners, but it is likely that partners bring varying amounts of resources into the household and that these resources of various types may produce differentials in survival net of own resources.

The present study examines the role of marital partners' sociodemographic characteristics for cancer survival. First, we studied gross differences in some of the prognostic factors (stage, cancer form, first course of treatment etc.) depending on own or partner's educational level. Next, we looked at gross differences in survival by partners' education and age. Thereafter, we assessed the impact of these partner characteristics net of stage differences at diagnosis and other illness characteristics. Lastly, we simultaneously studied the impact of the resources of patients and their partners.

Material and Methods

Register data encompassing the entire Norwegian population were obtained, and information on all married persons with a first diagnosis of a cancer tumor above age 50 during the period 1975-2007 were retrieved from the Cancer Registry of Norway. End of follow-up was December 31 2008. Cancer characteristics such as cancer form, stage, histological features and first course of treatment were extracted. Individual level characteristics such as age, sex, number of children, marital status, educational level were linked to these data at Statistics Norway by means of the unique personal identification number assigned all residents from 1960 onwards. Next, data on the patients' spouses at time of diagnosis were linked through unique family numbers.

Altogether, 280 456 married patients diagnosed with their first cancer after age 50 during 1975-2007 were included. Around 63% of the patients were male. A spouse at time of diagnosis was identified for 99.2% of the married cancer patients.

Descriptive statistics were used to assess cancer form and stage distributions at diagnosis across the different patient and spousal characteristics. Next, gross differences in survival by partners' education and age were studied by means of all-cause discrete-time hazard regression models with one-month intervals. Thereafter, we assessed the impact of these partner characteristics net of stage differences at diagnosis and other characteristics of the

illness. Lastly, we simultaneously studied the impact of own resources and partner's resources. The statistical significance level was set at 5%.

Results

Descriptive analyses

Persons were followed for an average of 4.3 years, and altogether more than 162 000 deaths occurred during the observation period. The most common cancer forms were breast (women), prostate (men), colorectal and lung cancer. A strong socioeconomic gradient was seen in the distribution of cancer forms known to be associated with smoking, like for instance lung cancer (Lindstrom, 2010). Around 41% of the cancers were localized at diagnosis, 35% regional, 10% distant, whereas it was unknown for the remaining 14%. Also the distribution of stage was strongly related to the educational level of both spouses, with the better educated presenting at an earlier stage (Kravdal, 2003).

Modeled estimates

Our study suggests that partners' characteristics matter for survival. The relative survival of patients with highly educated partners, net of their own education, is significantly higher than that of patients with lesser-educated partners. This remains true also after controlling for some of the important prognostic factors such as stage at diagnosis. Only considering the presence of partners will conceal important differences in survival among cancer patients.

Models in progress address potential gender differences in the effects we observe, and also attempt to look at differences in the effects between younger and older patients. Lastly, we will briefly estimate possible changes over time in the effect of the resources of oneself and one's partner, as cancer treatment and care patterns have changed quite a bit over the more than 30 year time period this study examines.

Discussion

Our results clearly indicate that partners' characteristics matter for survival. The net relative mortality of patients with highly educated partners, net of their own education, is significantly lower than that of patients with lesser-educated partners. Thus, the naïve perspective of only considering the presence of partners will conceal important differences in mortality among cancer patients.

Partners bring resources into a relationship/household and these resources shape survival prospects during treatment (Lai and Stotler, 2010;Nayeri et al., 1992;Osborne et al., 2005). Partners' education represents a manifold of directly available resources such as more knowledge and higher social status, as well as indirect resources available through the

partners' social network. The differences observed could also be related to differences in treatment provided or adherence, or the ability to follow-up over time.

The result of having these resources available is that cancer is diagnosed earlier (Lai and Stotler, 2010;Nayeri et al., 1992;Osborne et al., 2005). Those with highly educated partners have different stage distributions than others, and this may in part be related to the sociodemographic pattern observed in for instance partaking in cancer screening programs (Bowen et al., 2011;Seo and Lee, 2010). However, even when stage at diagnosis is controlled, those with highly educated partners enjoy a markedly lower mortality than those whose partners have less education.

The remaining of this discussion will be completed prior to the European Population Conference.

Conclusions and outline of further analyses

All effects suggested here as potentially producing a change in the relationship between partners' characteristics and cancer survival should be broadly relevant, so it is reasonable to expect similar trends in many other countries. Should that be confirmed in later studies, an important next step is to learn more about the relative importance of the various mechanisms. One could for instance explore mechanisms related to treatment types, e.g. study potential differentials in type of surgery, use of radiation therapy or differences in chemotherapeutic drugs offered. Perhaps even more important is to investigate possible differentials in treatment compliance, e.g. the taking of medication, meeting to consultations, following the doctors' advices, and so on. Findings from such research may have important implications for future cancer treatment and care.

In the complete paper, we will report detailed analyses of differences in cancer survival net of a large number of factors related to the two spouses, their relationship, and resources. Moreover, we will include a theoretical discussion of selection into marriage, matching patterns of spouses, and these processes potential implications for cancer development and survival.

Acknowledgements

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