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Review article

Sociodemographic, socioeconomic, and clinical determinants of survival in patients with cancer: A systematic review of the literature focused on the elderly

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ABSTRACT

Studies on cancer survival have revealed disparities not only between the elderly and their younger counterparts, but also among the elderly themselves. The aim of this work was to identify sociodemographic, socioeconomic, clinical, and care-related determinants of survival or mortality in older patients with cancer by a systematic synthesis of the literature. Understanding these factors is of great value for guiding health policies and programs aimed at reducing cancer survival disparities.

We conducted a search of MEDLINE and SCOPUS databases under PRISMA guidelines. Results were limited to articles published in English and French from 2005 to 2015, and focused on elderly patients with cancer. The article selection was performed in a stepwise fashion: title, abstract, and full-text selection. Studied determinants and results of each article were synthesized. Forty-five articles were eligible and included in the study. We observed different ways of measuring socioeconomic status, comorbidities, and treatment among studies. Cancer-specific and overall survival were the main studied outcomes. Advanced age, low income, low socioeconomic status, presence of comorbidities, advanced stage, and poor tumor grade were found to be associated with lower survival or higher mortality. On the other hand, female gender and being married were predictive of increased survival or lower mortality.

The next logical step is to carry out studies on elderly patients from different countries and to incorporate pertinent factors in a unique model. Moreover, specific geriatric health impairments should be taken into account in further research because of their association with survival.

Contents

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1. Introduction

Cancer is a major cause of morbidity and mortality worldwide. In 2012, 14.1 million new cancer cases were diagnosed globally and 8.2 million cancer deaths occurred [1]. More than half of all cancer cases and deaths occur in people aged 65 and over, and this trend is likely to increase in the coming years, mainly due to the aging population [2].

Even though chronological age is a risk factor for both cancer incidence and survival, the elderly do not represent a homogeneous group, and the notion of biological age is more relevant. Indeed, due to their biological age, health and the execution of functions can differ widely between two people of the same chronological age.

With the increase of cancer survival rates in recent years, more and more studies are focusing on understanding why some patients with cancer have higher survival than others. Studies have shown disparities in survival between the elderly and their younger counterparts. Screening in the elderly is less frequent, they are diagnosed at a later stage, and they receive less aggressive treatment (or no treatment) than younger people [3–8]. However, some other studies have also reported disparities among the elderly themselves. For example, the oldest and those with a high comorbidity index are diagnosed at a later stage, receive less aggressive treatment or no treatment, and have a lower survival rate [9–15].

Further understanding of these factors is needed to guide health policies and programs aimed at reducing cancer survival disparities. To our knowledge, no systematic review has been published that synthesizes all relevant factors or that reports main associations in cancer survival in the elderly. The aim of this study was to identify sociodemographic, socioeconomic, clinical, and care-related determinants of survival or mortality in older patients with cancer by carrying out a systematic review of the literature.

2. Materials and Methods

The review was conducted under PRISMA guidelines [16].

2.1. Search Strategy and Studies Selection

A search in MEDLINE and SCOPUS databases was performed and limited to articles published in English and French from January 2005 to August 2015 using the following Medical Subject Heading (MESH) terms for MEDLINE: ("Neoplasms/mortality"[Majr]) AND (("Aged"[Majr]) OR ("Aged, 80 and over"[Mesh])) AND (("Socioeconomic Factors"[Mesh]) OR ("Healthcare Disparities"[Mesh]) OR ("Health Status Disparities"[Mesh]) OR ("Health Services Accessibility"[Mesh])) AND ("2005/01/01"[Date - Publication]: "2015/08/31"[Date - Publication]). The gray literature was also searched. We included articles meeting the following criteria: 1) population-based studies, 2) studies about determinants of cancer survival (short-term mortality or survival excluded), 3) studies carried out in patients with cancer (regardless of the cancer site), 4) aged 65 years and over, and 5) studies about sociodemographic or socioeconomic factors. Case reports, clinical trials, and review articles were excluded; included were population-based studies that only focused on samples representative of elderly patients with cancer. The search focused on older patients with cancer only, and was limited to recent articles because the characteristics of the elderly population changed significantly in the past 20 or 30 years (i.e. demographics, health conditions). The article selection was performed in a stepwise fashion. One of the authors (AG) screened all titles and subsequently the abstracts, and made a selection of eligible articles identifying determinants of survival in elderly patients with cancer. The final article selection was presented to other authors and non-eligible articles were discussed with two authors (FD and SMP).

2.2. Data Extraction and Main Analyses

Two authors (AG, SMP) extracted the following data: information on articles (first author, journal, publication year), study characteristics (objectives, design, source of patients, population, setting, sample size, multivariate analysis), studied factors and survival or mortality outcomes. Measures of association and 95% confidence intervals were also extracted. Determinants studied and results were synthesized and presented from forest plots when measures of association were presented in the published article and when the analyses used a common reference class. In the case of binary variables and if the reference class was not the same between studies, the measures of association and their 95% confidence intervals were mathematically inversed to have the same reference class. Since each study could concern several outcomes and could present stratified analyses by cancer site, the results about determinants of survival were presented by analysis. When analyses were done in the entire study population and in the subgroups, only results about the entire study population were considered. In addition, when articles presented univariate and multivariate analyses, only results from multivariate analyses were presented.

3. Results

3.1. Literature Search and Study Characteristics

Out of the 476 articles identified from the literature search, 64 abstracts were identified as potentially related to our research question (Fig. 1). After full text reading of all available articles, we selected 45 studies.

All studies were retrospective cohorts from the United States using medical administrative (Medicare) and cancer registry (Surveillance, Epidemiology and End Results [SEER] program) databases. Studies were mainly on determinants of breast or colorectal cancer survival (n = 12 and n = 9, respectively). Over half of the studies (n = 27) included patients age 65 years and over and the remaining concerned patients age 66, 67 or 68 years and over (n = 16, n = 1 and n = 1, respectively) (Table A.1a).

3.2. Studied Determinants

Studied determinants included patient-, area-, tumor-, treatment-, health-, health care services- and other-related determinants (Table A.2). The most studied determinant was race (n = 35 studies). Authors were especially interested in the survival difference between black and white patients (n = 32). Presence of comorbidity and stage of cancer at diagnosis were also frequently studied (n = 19 and n =

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