ORIGINAL RESEARCH

Socioeconomic Inequalities in Colorectal Cancer Survival in Southern Spain: A Multilevel Population-Based Cohort Study

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Background: Colorectal cancer (CRC) is the most frequently diagnosed cancer in Spain. Socioeconomic inequalities in cancer survival are not documented in Spain. We aim to study the association of socioeconomic inequalities with overall mortality and survival among CRC patients in southern Spain.

Methods: We conducted a multilevel population-based cohort study, including CRC cases for the period 2011–2013. The study time-to-event outcome was death, and the primary exposure was CRC patients' socioeconomic status assessed by the Spanish deprivation index at the census tract level. We used a mixed-effects flexible hazard model, including census tract as a random intercept, to derive overall survival estimates by deprivation.

Results: Among 3589 CRC patients and 12,148 person-years at risk (pyr), 964 patients died before the end of the follow-up. Mortality by deprivation showed the highest mortality rate for the most deprived group (96.2 per 1000 pyr, 95% CI: 84.0–110.2). After adjusting for sex, age, cancer stage, and the area of residence, the most deprived had a 60% higher excess mortality risk than the less deprived group (excess mortality risk ratio: 1.6, 95% CI: 1.1–2.3).

Conclusions: We found a consistent association between deprivation and CRC excess mortality and survival. The reasons behind these inequalities need further investigation in order to improve equality cancer outcomes in all social groups.

Keywords: socioeconomic inequalities, colorectal cancer, survival, population-based epidemiology, epidemiological methods, multilevel

Introduction

In 2018, there were 9.6 million deaths caused by cancer worldwide, with cancer being the second leading cause of death.[1] Mainly due to global aging, the incidence of cancer is expected to increase in the coming decades in Europe. The economic and societal costs of cancer are rising sharply, affecting the economic growth of western countries.[2] Population-based cancer registries are an essential public health resource for epidemiological surveillance and cancer control.[3] Cancer registries provide population-based cancer survival estimates as a general indicator of the natural history of the disease and the effectiveness of the health system.[4] In northern European countries, cancer registries have a long tradition of using indices of deprivation to characterize cancer socioeconomic inequalities at a geographical level.[5]

Socioeconomic inequalities in cancer survival are well documented worldwide.[6–10] In the United Kingdom, cancer patients living in wealthier areas have higher survival

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