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Original Research

Survival and mortality rates of Wilms tumour in Southern and Eastern European countries: Socioeconomic differentials compared with the United States of America

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Abstract ***Background:*** Despite recent therapeutic advancements, Wilms tumour (WT) presents remarkable survival variations. We explored mortality and survival patterns for children (0–14 years) with WT in 12 Southern and Eastern European (SEE) countries in comparison with the United States of America (USA).
Methods: A total of 3966 WT cases (0–14 years) were registered by a network of SEE childhood cancer registries (N:1723) during available registration periods circa 1990–2016 and surveillance, epidemiology, and end results program (SEER) (N:2243; 1990–2012); mortality data were provided by the respective national statistical services. Kaplan–Meier curves and Cox proportional hazards models were used to assess the role of age, sex, year of diagnosis, urbanisation and Human Development Index (HDI) on overall survival (OS).
Results: Persisting regional variations shape an overall 78% 5-year OS in the participating SEE countries, lagging behind the USA figure (92%, $p=0.001$) and also reflected by higher SEE mortality rates. Worth mentioning is the gradually escalating OS in SEE (hazard ratio $[HR]_{5\text{-year increment}}$:0.67, 95% confidence interval [CI]:0.60, 0.75) vs. a non-significant 10% improvement in the SEER data, which had a high starting value. OS differentials [two-fold less favourable among children aged 10–14 years, boys and those living in rural SEE areas (HR:1.37; CI:1.10–1.71) or countries with inferior HDI (2–3-fold)] were minimal in the USA.
Conclusions: Children with WT residing in SEE countries do not equally enjoy the substantial survival gains, especially for those living in rural areas and in lower HDI countries. Noteworthy are steep and sizeable survival gains in SEE along with the newly presented Greek data pointing to achievable survival goals in SEE despite the financial crisis.

1. Introduction

Wilms tumour (WT) or nephroblastoma is an embryonal kidney tumour, slightly more common among girls representing around 6% of childhood (0–14 years) cancer cases [1,2]. Incidence rates in Europe (8.2/million) present significant regional differences (Automated Childhood Cancer Information System [ACCIS]) [1] being higher (9.2/million) in the participating Southern and Eastern European (SEE) countries [3].

Management of children with WT represents a success story in paediatric oncology [1]; over 90% of cases are successfully treated [4,5] in developed countries, and the challenge has lately shifted towards minimising short- and long-term toxicity [6]. Conversely, survival rates are still relatively poor in most developing countries [7].

In the present study, we aimed to calculate WT survival and mortality patterns during the last decades in 12 SEE countries, including Greece where the Nationwide Registry for Childhood Hematological Malignancies has been extended to include solid tumours. The role of gender and age, place of residence and Human Development Index (HDI) on overall survival (OS) was also examined in comparison with figures in the United States of America (USA), a country with higher HDI.

2. Materials and methods

An informal network initiated in the context of EUROpe against Cancer: Optimisation of the Use of Registries for Scientific Excellence in research project and comprising 12 population-based cancer registries in 11 SEE countries (Belarus, Croatia, Cyprus, Greece,