Survival of adolescent and young adults with cancer in Europe

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Rationale for the study

Adolescent and young adults (AYAs: 15 to 39 years of age) [1] with cancers are an emerging problem in oncology [2].

Cancer incidence in the AYAs group is higher than in children [3;4]. Survival in AYAs is worse than in children and in adult with biologically similar cancers [3;5] and only modest survival improvement [3;5;6] has been reported at the end of the nineties probably because AYAs have not been considered any differently from their elderly and childhood counterparts.

Survival data for young Europeans (below age 25) diagnosed with cancer are available in various EUROCARE publications [5;7] but are updated to the 2002.

Historically, little attention and few resources have been devoted to studying incidence, biology, and treatment outcomes in AYAs. Therefore, relatively little is known about biologic, genetic, epidemiologic, therapeutic factors that affect incidence, survival and quality of life of AYAs diagnosed with cancer. This proposal will contribute to increase epidemiological information on this specific age group of people with cancer supporting their clear clinical need.

Aim of the study

To estimate 5 year survival for AYAs diagnosed with cancer between 2000 and 2007 and to monitor survival changes in the period 1990-2007.

Methods of the proposed analysis

We will focus on all cancer combined and on the major cancers relevant for AYAs. An evident difference between malignant diseases in AYAs and those affecting both younger and older persons is the distinctive array of cancer types that occur in AYAs including: lymphomas, leukaemias, sarcomas and brain tumours (in the 15-19 years old), lymphomas, melanoma, thyroid cancer and testicular cancers (in 20–29 year olds) and breast and colorectal carcinomas which begin to occur with measurable proportionality in 20–29 year olds [8]

These cancers will be classified using both the ICCC and the ICD-O-3 classifications as reported in the table 1 below:

Table 1: AYA cancers included in the analyses

ICCC Ia	Lymphoid leukaemias
ICCC Ib	Acute myeloid leukaemias
ICCC IIa	Hodgkin lymphomas
ICCC IIb	Non-Hodgkin lymphomas
ICCC Xc	Germ cell (testis; ovary)
ICCC III b	Astrocytomas (including and excluding pilocytic astrocytoma)
ICCC III c	Medulloblastomas
ICD-O3	Brain (C71) excluding meningioma (9530-9539) and haematological tumours (9590-9989)
ICCC VIIIa	Osteosarcoma

ICCC VIIIc	Ewing tumour and related sarcomas of bone
ICCC IX	Soft tissue and other extraosseous sarcomas
ICCC IXa	Rhabdomyosarcomas
ICD-O3	Melanoma of skin (morphology 8720-8790 and topography C440-449)
ICD-O3	Thyroid carcinomas (C739)
ICD-O3	Breast (C500-509)
ICD-O3	Colon (C18)

Survival

We will estimate 1 and 5 year relative survival for all cases diagnoses diagnosed in the period 2000-2007, irrespective of the potential follow-up time, using the complete survival approach [9]. Survival for Europe as a whole will be estimated by weighting the country specific survival estimates with weightings proportional to the population of 15-19 and 20-39 years old in each country in 2000-2007. One and 5 year relative survival will be provided by age group (15-19; 20-29; 30-39; 20-39), sex, all cancers combined, major cancers listed in Table 1.

Because survival in AYAs is worse than in children and in adult with biologically similar cancers [3;5], a Cox proportional hazard model will be applied to each of the cancer listed in Table 1 to estimate the RR of death for 15-39 years old versus 0-14 (Lymphoid leukaemias, Acute myeloid leukaemias, Hodgkin lymphomas, Non-Hodgkin lymphomas, Astrocytomas, Brain, Osteosarcoma, Ewing tumour and related sarcomas of bone, Soft tissue and other extraosseous sarcomas, Rhabdomyosarcomas, medulloblastoma) and for 15-39 years old versus 40+ years old (Melanoma of skin, Thyroid carcinomas, Breast, Colon, Soft tissue and other extraosseous sarcomas, Rhabdomyosarcomas).

It could be useful to verify the availability of the information on stage (extend of disease) for the major cancers listed in Table 1. In case, cancer registries with at least the 75% of information available will be selected to study this important prognostic factor.

Survival time trend

To asses changes in survival over time, we will estimate 5-yer relative survival by the period approach for patients under observation in 1999-2001 (diagnosed 1995-2001), 2002-2004 (diagnosed 1998-2004), 2005-2007 (diagnosed 2001-2007).
Survival trends will be provided by age group (0-14, 15-19; 20-29; 30-39; 20-39), sex, all cancers combined, major cancers listed in Table 1.

EUROCARE data items requested

Cancer registry
Date of birth
Date of diagnosis
Date of death/last follow-up
Vital Status
Sex
ICD-O3 topography and morphology
Extend of disease
Life table
Population data

Proposed time schedule for the study

We would like to prioritise this article of the EUROCARE5 phase 3 publication plan. We are aiming at completing the analyses by march 2014, circulate the first draft by April 2014, revised the paper and submit it by June 2014.

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