RESEARCH ARTICLE

Data Quality of Childhood Cancer in Khon Kaen, Thailand, 1990-2007

Krittika Suwanrungruang[1], Supot Kamsa-ard[1], Surapon Wiangnon[2]*

Abstract

Introduction: Khon Kaen Cancer Registry (KKCR) was established in 1984. KKCR aims to collect all cancer cases in Khon Kaen Province. The poorly qualified data may lead to distort the cancer burden and misinterpretation of policy maker. Objective: To assess data quality in childhood cancer between 1990 and 2007 in Khon Kaen Province, Thailand. Materials and Methods: Data of childhood cancer cases aged less than 20 years diagnosed during 1990-2007 were retrieved from the population-based data set of KKCR. All childhood cancer data were verified before data entry. Internal consistency, percentage of morphological verification (MV%) and cancer cased of the basis of diagnosis by death certificate only (DCO%) were evaluated. The age-adjusted rate (ASR) was calculated by standard method. Results: The data of childhood cancer from KKCR is acceptably qualified which reflects the quality of the whole registration.

Keywords: Population-based - data quality - childhood

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Introduction

Currently, in Thailand childhood cancers become more important cause of death in children while poverty-related causes have been decreasing. KKCR was established for collecting cancer data in 1984. Since 2003 childhood cancers were systematically collected from existing cancer registries (Khuhaprema, 2007). Most of previous studies were concerned with incidence of childhood cancer (Sriamporn, 1996; Wiangnon, 2003).

Basically, incidence of childhood cancer remains unchanged and used as indicator of quality of cancer registration (Shin, 2007). To obtain data quality, it is crucial for registry to perform data surveillance and quality control.

The purpose of this study is to investigate the quality of data by using the childhood cancer in population-based data set of KKCR.

Materials and Methods

All of childhood cancers aged less than 20 years diagnosed during 1990-2007 were retrieved from population-based data set of KKCR. The data were explored and examined by using IARC tool for internal consistency. The internal consistency of data was verified by using IARCcrgTool program (Ferlay, 2005). The likely possibilities of these data were checked by using combination of individual item include age, sex, topology and morphology. The age-standardized incidence rate (ASR) was calculated by standard method (Boyle, 1991). Descriptively, the percentage was used to detail the proportion regarding gender, age at diagnosis and basis of diagnosis.

Results

Initially, 950 records were cross-checked for multiple tumors in the same individual. No identified multiple primaries but 4 duplicated records were found (0.42%). The remained 946 document records were then manually rechecked resulting in deletion of 47 cases according to misdiagnosis. Finally, internal consistency was then checked by using IARCcrgTool resulting in warning results of 49 records (47 individuals) which were 39 records of unlikely age-site-histology combination, 6 records of unlikely diagnostic basis-histology combination and 4 records of site-histology combination.

The study population comprised 899 cases of children cancer cases (493 males, 406 females, ratio 1.2), with the mean (SD) age of 8 (6.3) years, and 9.6 (6.3) years for male and female, respectively. Male affected more commonly than female at all age groups. The most common age-group for childhood cancer was 0-5 years. The age distribution of childhood cancer was shown in Figure 1.

Before 2000, the percentage of morphological verification (MV) varied between 70-80% while this MV increased to more than 80%, thereafter. At 2005, the percentage of MV was 97%. At the beginning, the basis of diagnosis by mean of death certificate only (DCO) was

*[1]Khon Kaen Province Cancer Registry, Cancer Unit, Srinagarind Hospital, [2]Department of Pediatrics, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand *For correspondence: suraponwiangnon@gmail.com*

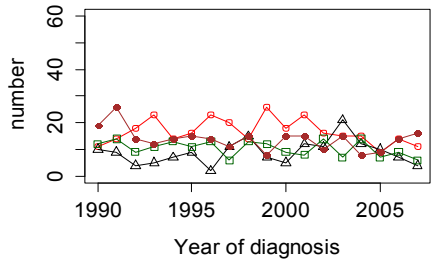

Figure 1. Age Distribution, Childhood Cancer in Khon Kaen, 1990-2007

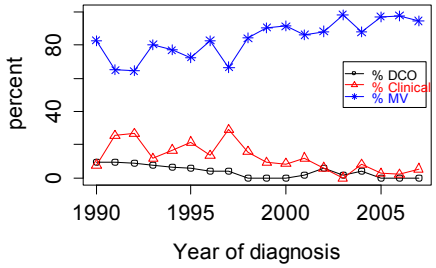

Figure 2. Percentage of Basis of Diagnosis, Childhood Cancer in Khon Kaen, 1990-2007

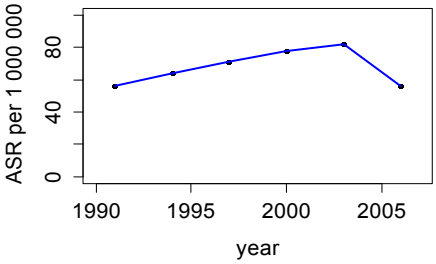

Figure 3. Age Standardized Incidence Rate (ASR), Childhood Cancer in Khon Kaen, 1990-2007

close to 10% and this value was declining and remaining below 5%. Likewise, the diagnosis by mean of clinical manifestation has been decreasing from approximately 10-20% at the initial phase (1990-2000) and remaining below 5% after 2000. The percentage of cases with MV, DCO and clinical-based diagnosis is presented in figure 2. The total percentage of cases recorded as having primary site tumor during 1990-2007 was 83.3%. The DCO rate for individuals with unknown primary site was 4%.

During the initial registration phase the ASR of childhood cancer has been slowly increasing from 56 in 1990 to 82.27 in 2003. Interestingly, the ASR was then abruptly declining without a clear explanation while the number of case was not much changed. The overall ASR of children in Khon Kaen during 1990-2007 is 67.9 per million.

Discussion

Generally, incidence of childhood cancer remains unchanged and used as indicator of quality of cancer registration (Shin, 2007). This is the first study in Thailand that investigates the quality of data of childhood cancer in population-based data set.

Currently, in Thailand childhood cancers become more important cause of death in children while poverty-related causes have been decreasing (Sutra, 2012; Wiangnon, 2012), even though the childhood cancer is less common than those in the western countries (Ries, 1999).

The reported age-standardized incidence rate of childhood cancer in Thailand were 79.3 (Khuhaprema, 2007) and in Khon Kaen 58.7 per million (Sriamporn, 1996). Recently, The Thai Pediatric Oncology Group collected the childhood cancers during 2003-5 from 20 treating centers in the whole country revealing the age standardized rate 74.9 per million (Wiangnon, 2011). The initial short-term ASR of childhood cancer in Khon Kaen (1988-91) was comparatively low when compared to the ASR in this long term registration (Sriamporn, 1996) which possibly explained by incomplete coverage. In addition, the incidence rate in Khon Kaen cannot completely compare with ASRs of the previous reports since the age of children population in this study was extended to 20 years. However, this incidence is very much lower than the one of USA incidence (Ries, 1999).

The children population in Thailand has been decreasing, likewise in Khon Kaen. The birth rate in Thailand is 11.5 births per 1,000 population and the death rate is 7.9 deaths per 1,000 population. Number of new case is slowly decreasing (Thailand population 2013). The quality of data as assessed by DCO (4%), and morphological verification (90%) is in acceptable range according to quality of data by CI5 criteria. (Curado, 2002) In addition, percentage of MV is increasing while the DCO and clinical-based diagnosis have been declining.

Basically, duplication may cause increased incidence. The duplication found in this registration was 0.04%. These records occurred during 1994 which happened before using individual identification number provided by ministry of internal affairs for data entering. The consistency and validity of cancer information data for data abstracting and data entering, these processes require training and monitoring the work of individual coder. After rechecking the consistency with IARCcrgTool, we still found the minimal inconsistency.

By assessing the quality of data by using various parameters, we would conclude that the data of childhood cancer from KKCR is acceptably qualified which reflects the quality of the whole registration.

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