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Mortality Trend of Hodgkin Lymphoma in Ecuador from 2000 to 2019

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ARTICLE INFO	ABSTRACT
	Introduction. Globally, the incidence of Hodgkin lymphoma (HL) increased from 1990 to 2017, presenting two incidence peaks regarding age, at 20–39 years, and 60 years or more. However, there is limited information about the mortality of this disease in the Ecuadorian population. This study aims to present the mortality trend of HL in Ecuador from 2000 to 2019. **Methods.** We performed an observational study, reporting the crude death rates by HL in the Ecuadorian population from 2000 to 2019, and its mortality trend analysis. Data were extracted from governmental databases published by the Ecuadorian National Institute of Statistics and Census (INEC). **Results.** From 2000 to 2019, INEC registered 862 deaths of patients with HL. From them, 355 (41.18%) were female, and 699 (81.09%) resided in urban areas, with an average age of 54.61 years. During the period studied, the mortality rates by HL in Ecuador presented a significant increasing trend (p=0.037), in which 2019 and 2018 were the years with the highest death rate (0.38 by 100,000 inhabitants), whereas 2001 and 2007 had the lowest death rate (0.20 by 100,000 inhabitants). Regarding age, we found a bimodal distribution of cases with two peaks in the 2nd and 7th decades of life. **Conclusion.** In this study, we found the highest mortality rate of HL in 2018 and 2019, with a significant increasing trend since 2000. Regarding age, we found two highest mortality peaks, which correspond to the 2nd and 7th decades of life, similar to other studies in the region. **Keywords:** Hodgkin lymphoma, mortality, epidemiology, Ecuador

INTRODUCTION

Hodgkin lymphoma (HL) represents a family of lymphoproliferative neoplasms characterized by the presence of tumoral Hodgkin/Reed-Sternberg cells in nearly 95% of cases [1].

Globally, the incidence of HL cases increased from 72,937 in 1990 to 101,133 in 2017, displaying two incidence peaks regarding age, at 20–39 years, and in patients aged 60 years or more [2].

In Latin America, HL incidence rates have shown a bimodal pattern and presented an increasing trend, which varied 7-fold in males and 11-fold in females, with the highest age-standardized incidence rate in Argentina, Brazil, Costa Rica (males), Cuba (males) and Uruguay (females). In contrast, the lowest rates in Bolivia and El Salvador [3]. Additionally, in the region, the age-standardized mortality rates increased by 4-fold in males and 6-fold in females [3].

Currently, the mortality of HL is lower than previous decades, which may be associated with improvements in diagnosis and new therapeutic strategies [4]. However, this may not be the case for developing countries. In this context,

knowledge of mortality trends is relevant to know how the disease affects our population.

Considering that there is limited information published regarding the mortality of HL in the Ecuadorian people, this study aims to present the mortality trend of HL in Ecuador from 2000 to 2019.

METHODS

We performed an observational and cross-sectional study, reporting the crude death rates by HL in the Ecuadorian population from 2000 to 2019, and its mortality trend analysis.

Data Obtention

Data were extracted from governmental databases published each year by the Ecuadorian National Institute of Statistics and Census (INEC). This information is presented in SPSS format and is freely available on the web site of the institution.

The datasets analyzed during the current study are available on the (Ecuador en Cifras: Camas y Egresos Hospitalarios) page, (https://www.ecuadorencifras.gob.ec/camas-y-egresos-hospitalarios/).
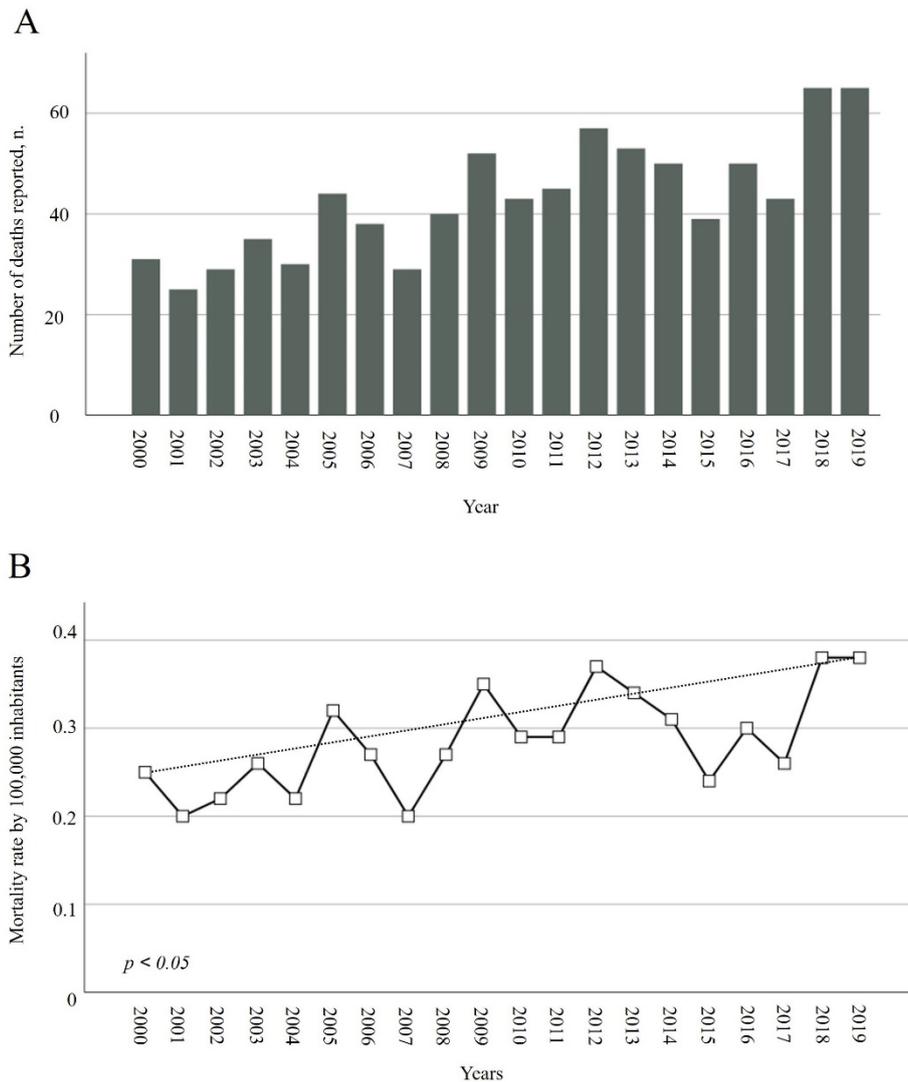
Figure 1. A, Number of deaths of patients with Hodgkin lymphoma in Ecuador, by year or report; B, Mortality trend of Hodgkin lymphoma in Ecuador

As the SPSS record has information on all the deaths reported in the country each year, we used the ICD-10 code C81 to find the patients affected by HL.

For this study, we included the following information: the total number of deaths reported by HL each year, the total number of inhabitants each year, and demographic characteristics including age, sex, area of residence (urban or rural), and ethnic group. We did not report the subtype of lymphoma due to the majority of cases being registered as unspecified HL.

Statistical Analysis

We performed the statistical analysis using the software SPSS V.23 and Excel 2013. Qualitative variables were presented as percentages and quantitative variables as average values with standard deviation.

To calculate the crude mortality rate, we used the equation:

$$Crude\ death\ rate = \frac{Total\ number\ of\ deaths\ in\ a\ calendar\ year\ by\ HL}{Estimated\ mid-year\ population\ that\ year} \times 10^5$$

To analyze the mortality trend significance, we used chi square test.

RESULTS

From 2000 to 2019, the INEC registered 862 deaths of patients diagnosed with HL. Of them, 507 (58.82%) were male, 355 (41.18%) female, and 699 (81.09%) resided in urban areas, with an average age of 54.61 years. The ethnic group was reported between 2009 and 2019, with mestizo ethnicity as the most frequently present.

The years with the highest number of deaths were 2019 and 2018, with 65 cases. In contrast, 2001 had 25 deaths reported (**Figure 1A**). Similarly, 2019 and 2018 were the years with the highest death rate (0.38 by 100,000 inhabitants), whereas 2001 and 2007 had the lowest death rate (0.20 by 100,000 inhabitants).

During the period studied, we found that mortality rates by HL in Ecuador presented a significant increasing trend using chi square test ($p < 0.05$) (**Figure 1B**).
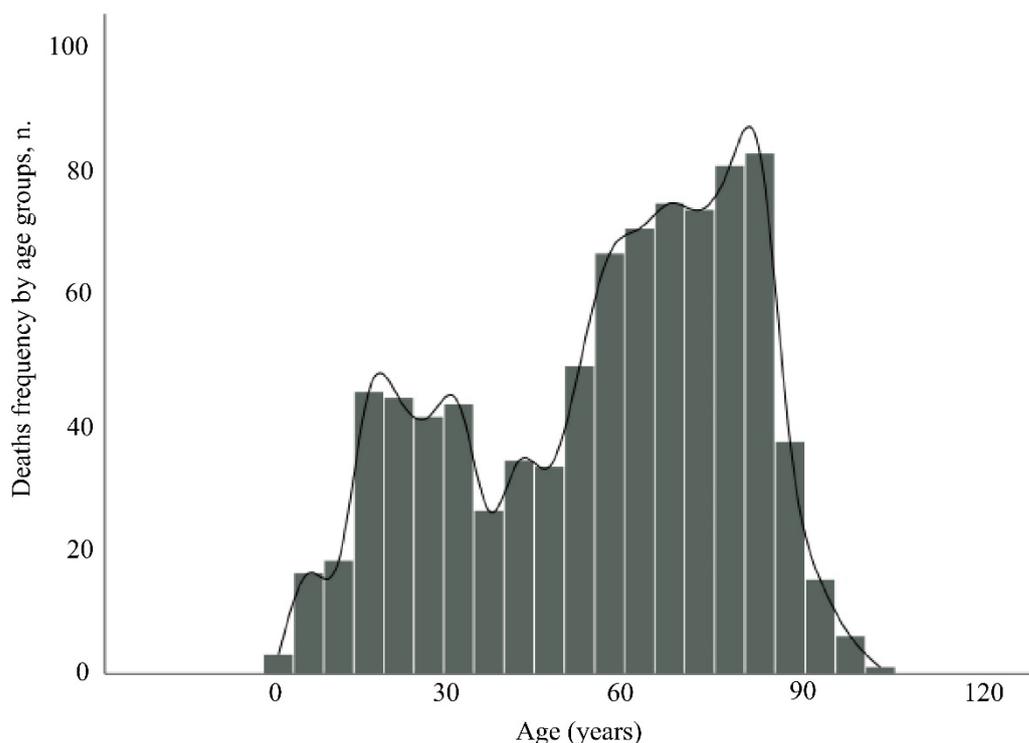
Figure 2. Deaths frequency of patients with Hodgkin lymphoma, by age

Additionally, regarding the age groups affected, we found a bimodal distribution of cases with two peaks in the 2nd and 7th decades of life (**Figure 2**).

DISCUSSION

In this study, we found the highest mortality rate of HL in 2018 and 2019, with a significant increasing trend since 2000, which is congruent with the findings of Kusminsky, et al. [3].

Regarding age, we found two peaks of highest mortality, which corresponds to the 2nd and 7th decades of life, similar as the incidence pattern reported among Hispanics in the United States: with one peak at ages 20–29 years, and a second peak in the elderly (70–79 years) [5].

Higher Morality in Elderly Patients

In this study, we observed that the mortality peak in elderly patients is significantly higher than the younger population. This finding may be explained as HL in elderly patients has a different presentation compared with the younger people. As an example, the more predominant histology is mixed cellularity. Also, more frequently older patients are diagnosed with advanced-stage HL, B Symptoms, and has a low tolerance to treatment due to pre-existing comorbidities, which results in dose reductions, therapy delays, and excessive treatment-related toxicity and mortality [6].

Increasing Trend in HL Mortality

An increasing mortality trend may rely on the fact that HL diagnosis improved during the last decades, and consequently, the register of deceased patients [7]. However, it is necessary to conduct more studies in the Ecuadorian population to compare how the more recent therapeutical approaches benefit the overall survival.

Limitations

This study had limitations, such as it is based in a secondary source, which does not exhibit all the clinical features for each patient and consequently, risk associations cannot be established. Also, national registries had limitations, which in the Ecuadorian population include inequalities by sex, geographical areas, and quality of the mortality registry [8].

CONCLUSION

In this study, we found the highest mortality rate of HL in 2018 and 2019, with a significant increasing trend since 2000. Regarding age, we found two highest mortality peaks, which correspond to the 2nd and 7th decades of life, similar to other studies in the region. We believe that the increasing trend in mortality is associated with the growing availability of diagnosing methods. However, more studies are needed to clarify this finding.

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