Trends in Incidence and Mortality by Ovarian Cancer in Latin American Countries

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Tendências de Incidência e Mortalidade por Câncer de Ovário nos Países da América Latina

Tendencias de Incidencia y Mortalidad por Cáncer de Ovario en Países de América Latina

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ABSTRACT

Introduction: Ovarian cancer is the seventh most common and the ninth cause of death by cancer in women worldwide. In Latin America, cancer is the second cause of death and projections indicate a probable growth of the number of deaths between 2012 and 2035. **Objective**: To analyze the trends of incidence and mortality by ovarian cancer in Latin American countries. **Method**: Ecological time series study, with incidence data extracted from the International Agency for Research on Cancer, from 1990 to 2012 and mortality data from 17 countries of the World Health Organization, from 1995 to 2013. An incidence trend was analyzed by the Joinpoint regression. The average annual percentage change (AAPC) and the 95% confidence interval were calculated for incidence and mortality. **Results**: The highest incidence rates of ovarian cancer were observed in Cali (Colombia) and Goiânia (Brazil) in the age group older than 60 years. There was a tendency towards stability in most countries, except in Goiânia (Brazil), in the age group from 60-74 years old, with an increasing trend (AAPC: 3.4%; 95% CI: 0.3; 6.6). The highest rate of mortality by ovarian cancer occurred in Uruguay for the age group of 60-74 years and the lowest, in Belize and Guatemala, for the age group of 0-39 years. **Conclusion**: The incidence of ovarian cancer in Latin America has remained stable in most countries. In some, as Brazil, increase of mortality rates was observed.

Key words: Ovarian Neoplasms/epidemiology; Ovarian Neoplasms/mortality; Incidence; Latin America/epidemiology.

RESUMO

Introdução: O câncer de ovário é o sétimo mais comum e a nona causa de morte por câncer em mulheres, no mundo. Na América Latina, o câncer é a segunda causa de morte, e as projeções indicam um provável crescimento no número de mortes entre os anos 2012 e 2035. **Objetivo:** Analisar as tendências de incidência e mortalidade para o câncer de ovário em países da América Latina. **Método:** Estudo ecológico de série temporal, com dados de incidência extraídos da Agência Internacional para Pesquisa do Câncer de 1990 a 2012, e dados de mortalidade obtidos de 17 países da Organização Mundial da Saúde de 1995 a 2013. A tendência de incidência foi analisada pela regressão *Joinpoint*. A variação percentual média anual (AAPC) e o intervalo de confiança de 95% foram calculados para incidência e mortalidade. **Resultados:** As maiores taxas de incidência para o câncer de ovário foram observadas em Cali (Colômbia) e Goiânia (Brasil) na faixa etária acima de 60 anos. Houve tendência de estabilidade na maioria dos países, exceto em Goiânia (Brasil), na faixa etária de 60-74 anos, que apresentou tendência de aumento (AAPC: 3,4%; IC 95%: 0,3; 6,6). A maior taxa de mortalidade por câncer de ovário ocorreu no Uruguai para a faixa etária de 60-74 anos e a menor, em Belize e Guatemala, para a faixa etária de 0-39 anos. **Conclusão:** A incidência do câncer de ovário na América Latina apresentou estabilidade na maioria dos países. Em alguns, como o Brasil, observou-se aumento nas tendências de mortalidade.

Palavras-chave: Neoplasias Ovarianas/epidemiologia; Neoplasias Ovarianas/mortalidade; Incidência; América Latina/epidemiologia.

RESUMEN

Introducción: el cáncer de ovario es el más común y la novena causa de muerte por cáncer en mujeres de todo el mundo. En América Latina, el cáncer es la segunda causa principal de muerte y las proyecciones se consideran un número probable de muertes entre los años 2012 y 2035. **Objetivo**: Analizar las tendencias de mortalidad y mortalidad por cáncer de ovario en los países latinoamericanos. **Método**: Estudio de series de tiempo ecológicas, con datos extraídos por la Agencia Internacional de Investigación sobre el Cáncer, de 1990 a 2012 y datos con mortalidad de 17 países de la Organización Mundial de la Salud, de 1995 a 2013. Se analizó una tendencia de incidencia mediante la regresión de Joinpoint. El cambio porcentual anual medio (AAPC) y el intervalo de confianza del 95% se calcularon para la incidencia y la mortalidad. **Resultados**: Las tasas de incidencia más altas de cáncer de ovario se observaron en Cali (Colombia) y Goiânia (Brasil) en el grupo de edad de más de 60 años. Hubo una tendencia hacia la estabilidad en la mayoría de los países, excepto en Goiânia (Brasil), en el grupo de edad de 60-74 años, con una tendencia creciente (AAPC: 3,4%; IC 95%: 0,3; 6,6). Las tasas de mortalidad más altas debidas al cáncer de ovario no ocurrieron en Uruguay para el grupo de edad de 60-74 años y las más bajas en Belice y Guatemala, para el grupo de edad de 0-39 años. **Conclusión**: La incidencia del cáncer de ovario en América Latina se ha mantenido estable en la mayoría de los países. En algunos, como Brasil, las tendencias de mortalidad pueden aumentar.

Palabras clave: Neoplasias Ováricas/epidemiología; Neoplasias Ováricas/mortalidade; Incidencia; América Latina/epidemiología.

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INTRODUCTION

Ovary cancer is the seventh most common cancer and the ninth cause of death by cancer for women in the world, representing 4.4% of cancer-related deaths[1]. In developed regions, the average risk of dying by ovary cancer before 75 years is twofold higher than in less developed regions with incidence above 7.5 per 100 thousand inhabitants[2].

In Latin America, cancer is the second cause of death and projections show that it can grow considerably between 2012 and 2035. It is estimated an increase of 91% of new cases and 106% of the number of deaths during this period because of ageing and change of fertility patterns in this region although internal differences in the incidence and mortality by cancer are expected, which can be related directly to the standard of development and distinct process of demographic and epidemiological transition experienced by each country of this region[3,4].

Among the ovary cancer associated factors, stand out: family history, reproductive (nulliparity, lactation, oral contraceptive, tubal ligation and oophorectomy) and those related to lifestyle and habits (smoke, increased consumption of meat and fat, physical inactivity)[5-8].

Because of its silent development, nearly ¾ of the ovary cancers are diagnosed at an advanced stage[9]. A factor that hampers the early diagnosis is the lack of strategies of easy access screening since the most practical form to identify the predisposition to the disease are the genetic tests that, further to its high cost, must be customized with the most common pathogenic variants in each population, which makes the access very restricted[10].

Cancer control has become a great challenge in Latin America. The increase of the incidence followed by disproportionally high mortality rates when compared to other world regions reveals the magnitude of the challenge to be faced. Despite the neoplasms are among the main causes of death in this region, the strategies of control deal with issues as organization and development of health services, mechanisms of formulation of policies and programs and even the mobilization of the society[11].

The description of geographical distribution of incidence and mortality of a cancer identifies the profile of the population and consequently its pattern of quality of life. Having in mind the difficulty Latin America countries face while controlling cancer and in consolidating early diagnosis for ovary cancer, it is necessary to know the epidemiology of this cancer in Latin America to help the elaboration of new policies of coping directed to areas and population groups more vulnerable.

Consequently, the objective of this study was to analyze the tendencies of incidence and mortality of ovary cancer in Latin America countries.

METHOD

Temporal series ecological study with secondary data available at the databases of the International Agency for Research on Cancer (IARC)[2] and of the World Health Organization (WHO)[12]. The trends of incidence and mortality of the ovary malignant neoplasm occurred in Latin America countries were analyzed.

Incidence cases of ovary malignant neoplasms during the 22 years period (1990-2012) were obtained from Cancer Incidence in Five Continents (CI5 XI) which included five registries of Population Based Cancer Registries (PBCR): four regional registries, Cali (Colombia), Goiânia (Brazil), Quito (Ecuador), Valdivia (Chile); and one national registry, Costa Rica[2]. For data of mortality, available information of 17 Latin American countries (Argentine, Belize, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Uruguay and Venezuela) were analyzed, representing nearly 90% of the population between 1995 and 2013[13].

The number of cases was extracted and specific age-adjusted rates per age were calculated for three age groups (0-39; 40-59 and 60-74) and for all ages. The division per age ranges proposed in this study had the objective of categorizing the data for better visualization of the groups with high burden of the disease based in the previous reading about age ranges of higher incidence and mortality. And all the ages represent the calculation of the incidence and mortality for the total population without division per age-ranges. The specific age-adjusted rates per age were calculated using the world standard-population according to the countries with data available.

The average annual percent change (AAPC) was estimated for incidence and mortality with confidence interval of 95% (CI 95%) in the period. The exceptions for these analyzes were Belize, Guatemala, Suriname and Uruguay because of missed data in the historical series. The statistical analyzes were performed with the software Joinpoint Regression Program, version 4.5.0.0, according to Kim et al[14].

RESULTS

Between 1990 and 2012, the highest incidence rates for ovary cancer occurred in Cali (Colombia) and Goiânia (Brazil), in the age range of 60 and 74 years with rates of 35.4 and 26.3 cases per 100 thousand inhabitants. Trend of stability was found for most of the countries, except in Goiânia (Brazil) in the age range of 60 to 74 years which increased (AAPC: 3.4%; CI 95%: 0.3; 6.6). The lower rates of incidence occurred in the age range from 0 to

39 years with trend of stability for the historical cohort (Table 1, Figure 1).

From 1995 to 2013, the highest rate of mortality by ovary cancer was registered in Uruguay (21.6 deaths/100 thousand inhabitants) for the age range from 60 to 74 years and the lowest in Belize and Guatemala (0.2 deaths/100 thousand inhabitants) for the age range from 0 to 39 years (Table 2).

In relation to the trends of mortality for the 13 countries investigated (Table 3, Figure 2) in the age range of 60 to 74 years, there was reduction only in Costa Rica (AAPC: -3.04%; CI 95%: -5.27; -0.76), for the others, there was trends of increase and stability. For the age range of 40 to 59 years the trends with significant increase occurred in El Salvador (AAPC: 5.80%; CI 95%: 3.01;8.67) and Panama (AAPC: 5.18%; CI 95%: 1.87; 8.61). No country presented reduction for this age range.

Regarding trends of mortality for the age range from 0 to 39 years, there was significant increase in Argentine (AAPC: 0.28%; CI 95%: 1.00; 1.58) and in Brazil (AAPC: 0.80%; CI 95%: 0.26; 1.35). The other countries kept stable.

DISCUSSION

The incidence of ovary cancer in Latin America kept stable through the series analyzed in the age range above 60 years for most of the countries, except Brazil where it increased. Among the age ranges investigated, the lower incidence rate was for younger women, from 0 to 39 years and the higher rates for older than 60 years that can be justified by the changes of the reproductive patterns (older age in the first delivery and low parity) and increase of life expectancy[4].

Studies corroborate that ovary cancer has high rates of incidence in other countries, not only in Latin America. In Central America, this is the eighth among the most frequent cancers in women in 2012 with incidence of five cases at each 100 thousand women in the less developed regions and 9.1 cases/100 thousand women in the more developed regions. In South America, ovary cancer was

Table 1. Data of Population Based Cancer Registries in Cali (Colombia), Costa Rica, Goiânia (Brazil), Quito (Ecuador) and Valdivia (Chile), period 1990-2012

PBCR	Available data	Group per age	Standardized incidence rate	AAPC (CI 95%)	*p-value*
Cali (Colombia)	1990-2012	0-39	1.7	-1.2 (-3.2; 0.8)	p>0.05
		40-59	16.8	-1.0 (-2.1; 0.1)	p>0.05
		60-74	35.4	-1.3 (-2.6; 0.1)	p>0.05
		Total	8.0	-1.1 (-1.9; -0.4)	p>0.05
Costa Rica	1990-2011	0-39	1.5	-0.1 (-1.5; 1.3)	p>0.05
		40-59	10.4	-0.7 (-1.8; 0.5)	p>0.05
		60-74	20.8	-0.6 (-2.2; 1.0)	p>0.05
		Total	5.2	-0.6 (-1.4; 0.3)	p>0.05
Goiânia (Brazil)	1993-2012	0-39	1.4	5.9 (-1.6; 13.9)	p>0.05
		40-59	13.5	0.3 (-2.2; 2.8)	p>0.05
		60-74	26.3	3.4 (0.3; 6.6)	p<0.05
		Total	6.3	0.9 (-3.1; 5.1)	p>0.05
Quito (Ecuador)	1990-2012	0-39	1.6	0.4 (-2.6; 3.6)	p>0.05
		40-59	15.8	0.5 (-1.8; 2.8)	p>0.05
		60-74	25.3	0.6 (-1.3; 2.5)	p>0.05
		Total	6.8	0.3 (-1.0; 1.7)	p>0.05
Valdivia (Chile)	1998-2012	0-39	1.5	-4.4 (-11.7; 3.4)	p>0.05
		40-59	15.3	-1.6 (-6.4; 3.5)	p>0.05
		60-74	23.9	-3.3 (-8.9; 2.7)	p>0.05
		Total	6.5	-2.8 (-6.2; 0.7)	p>0.05

Captions: AAPC: Average Annual Percent Change; CI: Confidence Interval; PBCR: Population Based Cancer Registries.
Note: Age-adjusted Standard Population (ASW/100 thousand inhabitants).

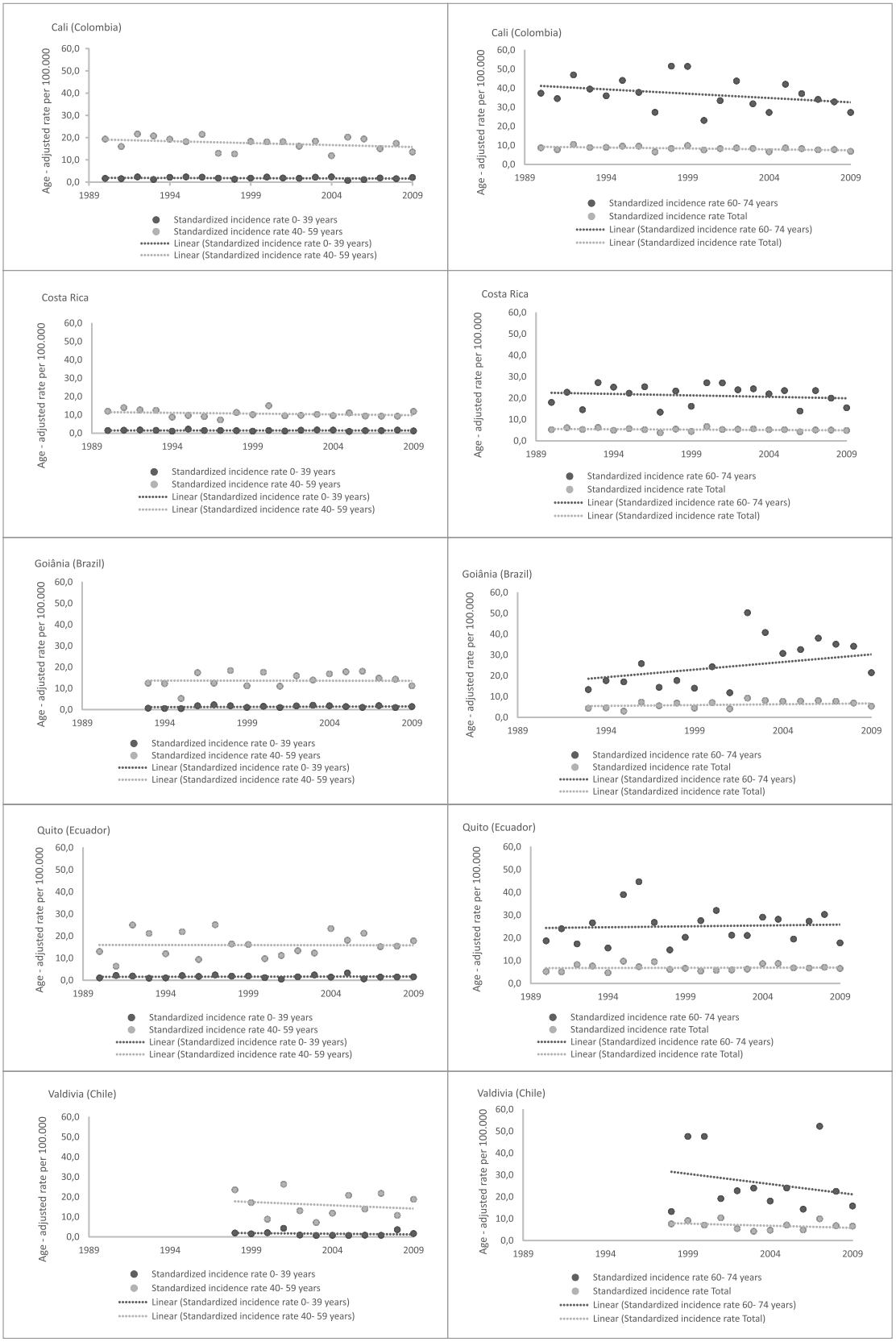

Figure 1. Rate of adjusted incidence rate per age 0-39 and 40-59 years and above 60 years and total for Cali (Colombia), Costa Rica, Goiânia (Brazil), Quito (Ecuador) and Valdivia (Chile) for ovary cancer, period 1990-2012

Source: Data extracted from CI5plus[2].
Caption: CI 95%: confidence interval of 95%.
Note: The gray line represents the trends of the period.

Table 2. Rate of standardized mortality rate per age per 100 thousand women, number of deaths by ovary cancer per age-range for 17 Latin American population, period 1995-2013

PBCR	Available data	Groups per age	Standardized mortality rate
Argentine	1997-2013	0-39	0.3
		40-59	7.1
		60-74	19.3
		Total	3.5
Belize	1997-2013	0-39	0.2
		40-59	2.9
		60-74	3.1
		Total	1.1
Brazil	1996-2013	0-39	0.3
		40-59	4.4
		60-74	12.6
		Total	2.3
Chile	1997-2013	0-39	0.3
		40-59	6.5
		60-74	16.1
		Total	3.0
Colombia	1997-2013	0-39	0.3
		40-59	5.4
		60-74	14.8
		Total	2.7
Costa Rica	1997-2013	0-39	0.3
		40-59	4.2
		60-74	13.1
		Total	2.3
Ecuador	1997-2013	0-39	0.3
		40-59	3.7
		60-74	8.6
		Total	1.8
El Salvador	1997-2013	0-39	0.3
		40-59	3.1
		60-74	6.7
		Total	1.5
Guatemala	2000-2013	0-39	0.2
		40-59	1.8
		60-74	4.0
		Total	0.9
Mexico	1998-2013	0-39	0.4
		40-59	5.3
		60-74	14.8
		Total	3.0
Nicaragua	1997-2013	0-39	0.3
		40-59	3.1
		60-74	7.6
		Total	1.6
Panama	1998-2013	0-39	0.3
		40-59	3.8
		60-74	12.4
		Total	2.2

to be continued

Table 2. continuation

PBCR	Available data	Groups per age	Standardized mortality rate
Paraguay	1996-2013	0-39	0.3
		40-59	4.1
		60-74	9.2
		Total	1.9
Peru	1999-2013	0-39	0.3
		40-59	4.1
		60-74	9.3
		Total	1.9
Suriname	1995-2013	0-39	0.4
		40-59	4.6
		60-74	14.0
		Total	2.5
Uruguay	1997-2013	0-39	0.3
		40-59	7.6
		60-74	21.6
		Total	3.9
Venezuela	1996-2013	0-39	0.4
		40-59	5.9
		60-74	14.8
		Total	2.9

Captions: PBCR – Population Based Cancer Registries.
Note: There were no data registered in 2011 in Uruguay. Age-adjusted standard population (ASW/100 thousand inhabitants).

Table 3. Trends of mortality per ovary cancer per age-range for 17 Latin American population, period 1995-2013

PBCR	Available data	Groups per age	AAPC (CI 95%)	*p-value*
Argentine	1997-2013	0-39	0.28 (1.00; 1.58)	p<0.05
		40-59	0.03 (0.53; 0.60)	p<0.05
		60-74	-0.30 (0.87; 0.27)	p<0.05
		Total	-0.13 (-0.51; 0.25)	p>0.05
Belize	1997-2013	0-39	-	-
		40-59	-	-
		60-74	-	-
		Total	-	-
Brazil	1996-2013	0-39	0.80 (0.26; 1.35)	p<0.05
		40-59	0.34 (0.03; 0.66)	p<0.05
		60-74	0.56 (0.18; 0.94)	p<0.05
		Total	0.48 (0.25; 0.71)	p<0.05
Chile	1997-2013	0-39	-2.10 (-4.18; 0.03)	p>0.05
		40-59	-1.56 (-2.76; 0.34)	p>0.05
		60-74	0.21 (-0.55; 0.98)	p>0.05
		Total	-0.74 (-1.50; 0.03)	p>0.05
		60-74	-0.13 (-0.77; 0.51)	p>0.05
		Total	0.40 (-0.11; 0.90)	p>0.05
Costa Rica	1997-2013	0-39	-0.59 (-5.86; 4.97)	p>0.05
		40-59	0.59 (-1.67; 2.90)	p>0.05
		60-74	-3.04 (-5.27; -0.76)	p>0.05
		Total	-1.31 (-2.47; 0.13)	p>0.05

to be continued

Table 3. continuation

PBCR	Available data	Groups per age	AAPC (CI 95%)	*p-value*
Ecuador	1997-2013	0-39	-1.05 (-2.79; 0.73)	p>0.05
		40-59	0.03 (-1.34; 1.43)	p>0.05
		60-74	3.14 (1.54; 4.76)	p<0.05
		Total	1.22 (0.27; 2.19)	p<0.05
El Salvador	1997-2013	0-39	2.93 (-2.13; 8.25)	p>0.05
		40-59	5.80 (3.01; 8.67)	p<0.05
		60-74	4.11 (0.71; 7.63)	p<0.05
		Total	4.56 (2.02; 7.15)	p<0.05
Guatemala	2000-2013	0-39	-	-
		40-59	-	-
		60-74	-	-
		Total	-	-
Mexico	1998-2013	0-39	0.47 (-0.63; 1.59)	p>0.05
		40-59	0.89 (0.53; 1.25)	p<0.05
		60-74	1.41 (0.90; 1.93)	p<0.05
		Total	1.09 (0.75; 1.42)	p<0.05
Nicaragua	1997-2013	0-39	-1.96 (-6.04; 2.29)	p>0.05
		40-59	3.24 (0.53; 6.02)	p<0.05
		60-74	0.57 (-2.20; 3.42)	p>0.05
		Total	1.17 (-0.56; 2.93)	p>0.05
Panama	1998-2013	0-39	0.82 (-4.61; 6.55)	p>0.05
		40-59	5.18 (1.87; 8.61)	p<0.05
		60-74	1.09 (-1.21; 3.45)	p>0.05
		Total	2.41 (0.17; 4.70)	p<0.05
Paraguay	1996-2013	0-39	0.45 (-5.09; 6.30)	p>0.05
		40-59	0.99 (-0.94; 2.96)	p>0.05
		60-74	3.19 (-0.32; 6.82)	p>0.05
		Total	1.73 (-0.13; 3.63)	p>0.05
Peru	1999-2013	0-39	1.81 (-0.97; 4.66)	p>0.05
		40-59	1.97 (0.58; 3.37)	p<0.05
		60-74	2.88 (0.84; 4.96)	p<0.05
		Total	2.30 (0.97; 3.65)	p<0.05
Suriname	1995-2013	0-39	-	-
		40-59	-	-
		60-74	-	
		Total	7.19 (0.82; 13.95)	p<0.05
-		60-74	-	-
		Total		-
Venezuela	1996-2013	0-39	-0.77 (-2.07; 0.54)	p>0.05
		40-59	0.72 (-0.20; 1.65)	p>0.05
		60-74	0.54 (-0.11; 1.20)	p>0.05
		Total	0.46 (0.01; 0.92)	p<0.05

Captions: AAPC: Annual average percent change; CI: Confidence Interval; PBCR: Population-based Cancer Registries.
Note: Age-adjusted standard population (ASW/100 thousand inhabitants).

the seventh with incidence of 5.8 cases/100 thousand women in the less developed regions and 9.1 cases/100 thousand women in the most developed[15,4].

Ferlay et al.[13] indicate an estimate of the incidence of ovarian neoplasms of 12.9 cases for each 100 thousand women in the European countries in 2018. The higher incidences were observed in Serbia (21.8 cases/100 thousand women) and Belarus (20.1 cases/100 thousand women) and the lower in Albania (5.1 cases for each 100 thousand women). Studies emphasize that countries with

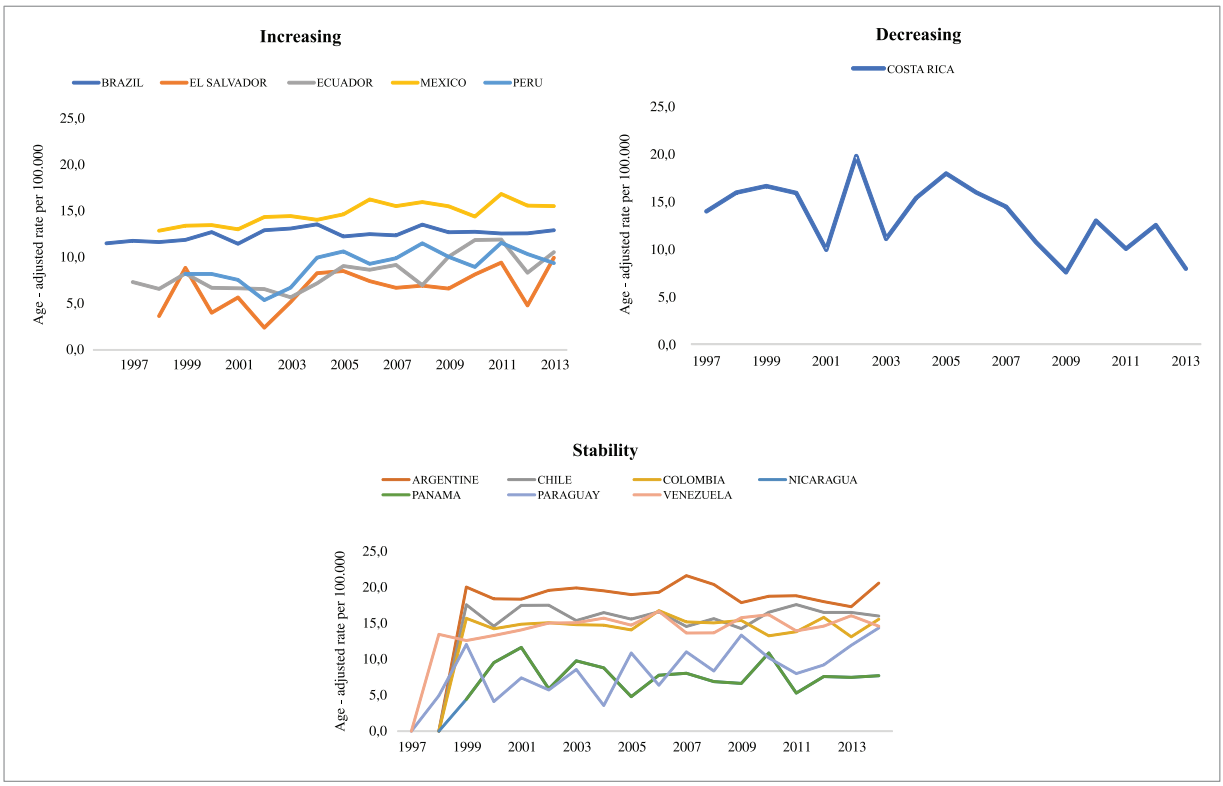

Figure 2. Temporal trend of mortality per ovary cancer for the group of women older than 60 years in 13 countries of Latin America, period 1995-2013.
Source: Data extracted from WHO Mortality Database[12].

high/very high Human Development Index (HDI) have more incidence of ovary cancer when compared with medium/low HDI[1].

According to Souza et al.[15], approximately 70% of the ovarian tumors occur in reproductive age with high incidence between 21 and 40 years old. In the present study, it was found higher number of cases occurring in Latin America for the age range from 40 to 59 years. Based in the data of cumulative prevalence studies show that the likelihood of a woman to have ovary cancer between birth and 85 years is 1.5% and global survival is from 30% to 40% in five years[16-18].

Regardless of the lower incidence of cancer in Latin American compared with European countries and the United States, mortality by this cancer is bigger[19]. The analysis of mortality among the countries investigated indicates the age range older than 60 years as with more deaths by ovary cancer, Uruguay standing out with the higher mortality rate for the age range from 60 to 74 years old.

In Uruguay, ovary cancer is the seventh most prevalent and the sixth that causes more deaths among all the cancers in women[20]. Although studies disclosed in the Economist Intelligence Unit[3] indicate Uruguay as the country that has the best cancer control program in Latin America, it is one of the countries with lower fertility in Latin America.

It is worth mentioning the trends of mortality in the age range from 0 to 39 years with tendency of significant increase in Brazil (AAPC: 0.8%; CI 95%: 0.26; 1.35) and in Argentine (AAPC: 0.28%; CI 95%: 1.00; 1.58).

In a study conducted with data of the Brazilian Mortality Information System (SIM) the investigators indicated that from 1980 to 2014, the mean rate of mortality by ovary cancer was 4.91 deaths per 100 thousand women with progressive increase of the mortality with ageing for all Brazilian regions. In addition, this study showed still a heterogeneous standard in the temporal evolution of the mortality by ovary cancer in the Brazilian geographical regions with significant and positive risk of death for the older cohorts in the South and Southeast and reduced risk for the younger cohorts, the opposite of what happened in the North and Northeast regions[21].

In this sense, it is necessary in Brazil to rethink ovary cancer prevention actions although efforts to fight cancer have been detected from the publication of Directive number 2,439 dated December 8, 2005[22], revoked by Directive number 874, dated May 16, 2013[23] creating the National Policy for Cancer Prevention and Control

(PNPCC) in the Healthcare Network for Persons with Chronic Diseases (RASPDC) within the National Health System (SUS). Health promotion and surveillance are among its components aimed to actions that favor the reduction of risk factors for neoplasms. Still, this measure was not enough to provoke changes in the next decades as the present study showed, which brings the necessity of revising this Directive, and possible gaps in its implementation[22-24].

The outlook of the incidence and mortality by ovary cancer in Latin America allows the reflection about the current status of the health systems, that in general are structurally fragmented providing minimum care and sometimes, only emergencies. Additionally, the current global crisis resonates in health planning and budget. Further, the uneven allocation of human resources, the concentration of health professionals in the large urban centers and underfunding of equipment and infrastructure lead to the replication of socioeconomic inequalities in caring for individuals with cancer, as ovary cancer, contributing for the consolidation of the epidemiologic aspects described in the present study[11].

Based in this, it is possible to infer that the data of incidence and mortality by cancer in Latin America are the consequences of organization issues of the cancer control programs, of the quality of the services offered, the health services infrastructure and the reduced number of specialized professionals; it can also influence the continuation and integration of the care and the return of the patient to the origin health unit resulting in difficulty of early diagnosis and diminishing the chances of cure of some cancers, specially ovary cancer[4].

The possibility of sub-notification is a limitation identified in this study. Although the number of PBCR included in CI5plus has increased in the last years, some countries still do not meet the quality standards and insertion of data as is the case of Belize, Guatemala, Suriname and Uruguay that failed to have mortality tendencies calculated for lack of registered cases in the historical series. The sub-notification of patients with cancer can lead to the underestimation of the incidence and mortality rates and hamper the evaluations of the control programs and cancer fight. In despite of these limitations, the data utilized in the present study were validated by international organizations and can be used to describe the mortality in Latin American countries.

CONCLUSION

High rates of ovary cancer in some countries of Latin America can reflect deficiencies in the early detection and control of the disease. This study analyzed the incidence of ovary cancer from PBCR of four cities and of one country and the trends of 12 Latin America countries.

While analyzing the incidence of ovary cancer, trends of stability for some countries were shown as Ecuador. However, it was observed an increase for women older than 60 years in Brazil. For mortality, there was a propensity to stability in most of Latin America countries as Argentine and in Brazil there as an increasing tendency for this variable.

The present study offers a relevant vision about the epidemiologic profile of ovary cancer and contributed for the identification of the relevance and magnitude of this disease for the Latin America population. These analyzes help the elaboration of policies that can be implemented and targeted to the areas of greater vulnerability.

CONTRIBUTIONS

Maria Aparecida Paulo dos Santos, Fábia Cheyenne Gomes de Morais Fernandes and Isabelle Ribeiro Barbosa contributed substantially for the study conception, design and collection, analysis and/or interpretation of the data. Emelynne Gabrielly de Oliveira Santos and Dyego Leandro Bezerra de Souza contributed for the wording and/or critical review. All the authors approved the final version to be published.

DECLARATION OF CONFLICT OF INTERESTS

There is no conflict of interests to declare.

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