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Congenital Syphilis in Ecuador is a still unsolved problem?

La sífilis congénita en Ecuador ¿un problema aún sin resolver?

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Abstract

Congenital syphilis represents a public health problem. Despite the increases in prenatal care coverage, the actions implemented still show low effectiveness in their prevention. An epidemiological, observational, cross-sectional study is presented, in which data were obtained from the National Institute of Statistics and Censuses (INEC) with the purpose of establishing the current situation of congenital syphilis in Ecuador, taking into consideration the data throughout the last years. According to the registries, no cases of late syphilis have been reported for 6 years. The reports prior to 2004 are irregular, the data recorded from 2005 on are more reliable due to the mean and standard deviation data. There is a slight downward trend from 2003 to 2011 showing an increase of 200 reported cases in 2013. No detailed data was found as of 2016. Congenital syphilis still prevails, with a slightly higher prevalence in men, although the ratio (male / female) is kept at 1: 1. Since 2005 there is no significant variation. A downward slope is evident, but the mean values would indicate a plateau during the last 7 years. This fact will determine a blockage of the expected decrease in the number of cases. There is no proper official data record. The prevalence in Ecuador for the year 2019 shows 320 reported cases, but it remains stationary, with Guayas being the most affected province. The prevention, control and monitoring guidelines must be reviewed by the health authorities.

Keywords: syphilis, congenital, epidemiology, disease prevention.

Resumen

La sífilis congénita representa un problema de salud pública. A pesar de los incrementos en la cobertura de atención prenatal, las acciones implementadas aún exhiben baja efectividad en su prevención. Se presenta un estudio epidemiológico, observacional, transversal, en el cual se obtuvieron datos del Instituto Nacional de Estadística y Censos (INEC) con el propósito de establecer la situación actual de la sífilis congénita en el Ecuador tomando en consideración los datos a lo largo de los últimos años. De acuerdo con los registros no se han reportado casos de sífilis tardía desde hace 6 años. Los informes anteriores al año 2004 son irregulares, los datos registrados a partir de 2005 son más fiables debido a los datos de media y desviación estándar. Existe una ligera tendencia a la baja desde 2003 hasta 2011 que muestra un aumento de 200 casos notificados en 2013. No se encontraron datos detallados a partir del 2016. Aún existe predominio de sífilis congénita, con una prevalencia levemente mayor en los hombres, aunque la proporción (hombre / mujer) se mantiene en 1:1. Desde 2005 no hay una variación significativa. Se evidencia una pendiente descendente, pero los valores medios indicarían una meseta durante los últimos 7 años. Este hecho determinará un bloqueo del descenso esperado del número de casos. No existe un registro oficial de datos adecuado. La prevalencia en Ecuador para el año 2019 muestra 320 casos reportados, pero aún se mantiene estacionaria, siendo Guayas la provincia más afectada. Las directrices de prevención, control y seguimiento deben ser revisadas por las autoridades sanitarias.

Palabras claves: sífilis, sífilis congénita, epidemiología, prevención de enfermedades.

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Introduction

Congenital syphilis (CS) is still a major public health problem, according to World Health Organization WHO [1]. Researchers estimate that congenital syphilis is a complicating factor in about 1 million pregnancies every year worldwide. CS has a largely contributed toward infant death and has been responsible for 305,000 perinatal deaths worldwide annually [2].

While the prevalence of CS remains low in most developed countries, it has been a subtle remerging of the disease in some European countries including Spain, and South America. For 2006 in Latin America was overall reported 8.423 cases of CS, more than 164.000 children were born with CS in Latin American and Caribbean countries since 2007. By 2013 the overall reported cases were 13.831, Colombia reports 287.3 cases per 100,000 live births, Venezuela 4.6 cases per 100,000 live births, Argentina 99 cases per 100,000 live births, Honduras 14.7 cases per 100,000 live births, Cuba reports less than 2.4 by per 100,00 live births and Brazil 388.4 per 100,000 live births [3].

Despite the increase in prenatal care coverage in Ecuador, the actions implemented exhibit low effectiveness in its prevention [4]. This disease without treatment, it is lethal [5]. The disease can manifest according to severity, such as late abortion, stillbirth, and low birth weight. The first manifestations of syphilis in the neonatal period include aseptic meningitis, seizure, rash, and neonatal death. It can also manifest as a latent infection leading to subsequent sequel [6]. Syphilis is a systemic an exclusive human sexually, sanguineous, and perinatal transmitted disease caused by the spirochete Treponema pallidum [7,8].

CS´s transmission occurs transplacentally at any time during gestation. The risk of transmission to the fetus depends on the stage of maternal infection. Usually, the longer before the pregnancy occurred the primary infection, the more benign the result regarding the rate and severity of infection. Untreated primary or secondary syphilis in pregnancy results in a 25% risk of stillborn, a 14% risk of neonatal death, a 41% risk of giving birth to a live but infected infant and only a 20% chance of giving birth to a healthy, uninfected infant [9]. Cohort studies have been consistent in finding that substantial proportions (40 to 81%) of syphilis-exposed fetuses are severely affected, with stillbirth neonatal death being the most significant consequences [10].

However, fetal compromise is generally not manifested until later in the second or third trimesters with maturation of the fetal immune system [11]. As syphilis remains an easily treatable disease, most cases of CS are seen in women who did not receive proper prenatal care or receive improper treatment. Treatment of early maternal syphilis at least 30 days before delivery is the most important factor influencing the risk of congenital infection. Seventy to 100 percent of infants born to untreated mothers will be infected compared to 1 to 2 percent of those born to women adequately treated during pregnancy [12].

WHO estimates most maternal syphilis infections are untreated and of sufficiently high-titer (RPR≥1: 8) [13] and 71 % of the syphilis diagnoses occurred when the patient requested care for symptoms [3]. Routine screening of newborns sera or umbilical cord blood is not recommended, as diagnosis at this time does not prevent symptomatic congenital syphilis in some newborns [14]. Effective prevention and detection of CS depends on the identification of syphilis in pregnant women and, therefore, on the routine serologic screening of pregnant women during the first prenatal visit. Additional testing at 28 weeks of gestation and again al the delivery is warranted for woman who increased risk or live-in communities with increased prevalence of syphilis infection [15]. The mother has untreated syphilis, or the treatment is undocumented or inadequate (four weeks before delivery or with any nonpenicillin G regimen), a complete evaluation consisting of cerebrospinal fluid analysis, long bone radiographs, and complete blood cell and platelet counts should be performed to guide optimal therapy [16].

However, infection rates are shown also among women, especially pregnant women. This group needs special attention due to the importance for the incidence and the prevalence of congenital syphilis. Active syphilis in pregnant women presents fetal or perinatal death and serious neonatal infection. CS elimination as a public health problem will be achieved through reduction on prevalence of syphilis of pregnant women and reducing mother to child transmission of syphilis [17]. The economic burden associated with the treatment of CS affects not only families, but society. The hospitalization cost for an infant affected by CS is as much as 7 times higher, and the length of hospital stay is approximately 8 days longer than for a healthy infant. These cost increase estimates do not include post discharge medical expenses related to late CS. In comparison, prenatal screening offers a long-term cost-benefit for public health entities [18].

In this paper, it analyzes the prevalence of the disease in Ecuador through the time, to set the evolution and the situation of the same, and its implications to reduce child mortality through reductions in perinatal deaths and low-birth-weight infants.

Methods

Study design: epidemiological, observational, and cross-sectional study.

Data source: National Census and Statistics Institute (INEC) of Ecuador. Data was obtained from birth, annual reports, death reports and hospital bed occupation, during the years 2000 to 2016. The statistics are of national, urban, rural, regional, provincial, cantonal, and parochial coverage. The information was collected in all the establishments that provide hospitalization at the national level and the patients diagnosed according to the clinical and laboratory parameters were taken into consideration.

Specific methods: it used an information collection sheet, to gather all information required.

Statistical analysis: data collection, analysis and evaluation were collected in an Excel database to be analyzed with the SPSS© software version 22, licensed; appropriate descriptive statistics were used for the analysis.

Avoided biases: it was verified that all the information was complete; the information was always collected by the same operator.

Limitations: being a purely descriptive work based on databases, there were limitations such as, for example, validating the cases individually with the patient directly to confirm the diagnosis, it could not fully establish if there were cases of re-admissions even when each of the cases was verified through clinical records, and there is a general sub-registry in the country that could vary the study.

Ethical criteria: no approval was required. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards [19].

Result

It analyzed 2701 cases corresponding to Congenital Syphilis (CS), Early Syphilis (ES), Late Syphilis (LS) and other types of Syphilis (OS) according to the ICD 10, during the years 2000 to 2016. The annual average of cases reported with CS was 124.12 (SD 42.41), ES 11.41 (SD 8.10), LS 10.47 (SD 12.50), and finally, OS 12.88 (SD 6.49). Distribution of cases of CS between 2000 and 2003 shows an increase of 43.38 cases per year with an average of 167.5 cases reported in four years, similar to the period 2012 to 2016 with an average of 150.8 cases per year and an increase of 26.68 cases during that period. The highest rate of reported cases of CS was 59.45 cases per 100,000 live births in 2013 (Table 1). The provinces of Pichincha and Guayas show most reported cases to be provinces of national reference; however, the province of Los Rios also reports a significant increase with 31 cases of CS in 2002, with an average of 19 cases per year compared with other provinces. Some data indicate that during the years 2017 and 2018 of every 293,139 and 291.39 live births, 261 and 129 cases were diagnosed, respectively (data not revealed).

Table 1. Syphilis infection prevalence in Ecuador (2000-2016)

Year	Congenital Syphilis			Early Syphilis			Late Syphilis			Other Syphilis			Total
	N	%	Rate	n	%	Rate	n	%	Rate	N	%	Rate	
2016	117	55.18	36.70	14	6.60	4.39	13	5.38	4.00	6	2.83	1.88	150
2015	140	66.03	43.92	26	12.26	8.15	29	12.01	8.92	8	3.77	2.50	203
2014	155	73.11	48.63	27	12.74	8.47	0	0.00	0.00	30	14.15	9.41	212
2013	193	80.08	59.45	24	9.96	7.39	9	3.73	2.77	15	6.22	4.62	241
2012	149	81.87	43.17	16	8.79	4.64	12	6.59	3.48	5	2.75	1.45	182
2011	72	77.42	20.70	6	6.45	1.73	0	0.00	0.00	15	16.13	4.31	93
2010	87	86.14	24.75	8	7.92	2.28	0	0.00	0.00	6	5.94	1.71	101
2009	84	80.77	23.25	7	6.73	1.94	0	0.00	0.00	13	12.50	3.60	104
2008	118	83.69	31.92	5	3.55	1.35	0	0.00	0.00	18	12.77	4.87	141
2007	74	72.55	20.02	6	5.88	1.62	0	0.00	0.00	22	21.57	5.95	102
2006	71	78.89	20.60	8	8.89	2.32	0	0.00	0.00	11	12.22	3.19	90
2005	81	73.64	25.34	9	8.18	2.82	13	11.82	4.07	7	6.36	2.19	110
2004	99	55.62	32.39	19	10.67	6.22	46	25.84	15.05	14	7.87	4.58	178
2003	192	83.12	57.68	9	3.90	2.70	15	6.49	4.51	15	6.49	4.51	231
2002	157	83.07	49.91	3	1.59	0.95	20	10.58	6.36	9	4.76	2.86	189
2001	172	88.21	51.69	4	2.05	1.20	10	5.13	3.01	9	4.62	2.70	195
2000	149	83.24	43.10	3	1.68	0.87	11	6.15	3.18	16	8.94	4.63	179
	Mean	SD		Mean	SD		Mean	SD		Mean	SD		Mean
	124.12	42.41		11.41	8.10		10.47	12.50		12.88	6.49		158.88

Rate calculated by 100.000 live births
Data source: INEC
Overall prevalence in male reported was 50.45% and female 49.54%.
SD: standard deviation

The global predominance of syphilis is attributed to the male population. In general, statistics within CS syphilis group men appear with greater prevalence. Nevertheless, this is not decisive. There is the need to observe data during the years 2001, 2004, 2005, 2010 and 2011. During those years female prevalence is shown (Table 2). Some records indicate that during 2017, 69 cases of congenital syphilis were diagnosed in males and 60 in females, while in 2018 the figure increased to 142 cases of congenital syphilis in males and 119 in females.

Regarding the prevalence first years of registry (2000 to 2003) shows cases as higher as the end of the baseline (2012 to 2016) (Figure 1).

Table 2. Sex distribution of Syphilis in Ecuador (2000-2016)

	Congenital Syphilis			Early Syphilis			Late Syphilis			Other Syphilis		
	Men n= (%)	Women n= (%)	Total	Men n= (%)	Women n= (%)	Total	Men n= (%)	Women n= (%)	Total	Men n= (%)	Women n= (%)	Total
Total	958 (51.70)	895 (48.30)	1853	81 (52.60)	73 (47.40)	154	62 (44.93)	76 (55.07)	138	112 (52.58)	101 (47.42)	213
Mean	64.35	59.76	124.11	5.40	4.87	10.27	4.13	5.07	9.2	7.467	6.73	14.2
SD	23.73	20.14	45.10	3.79	4.47	7.61	5.04	7.41	12.32	4.44	3.61	7.08

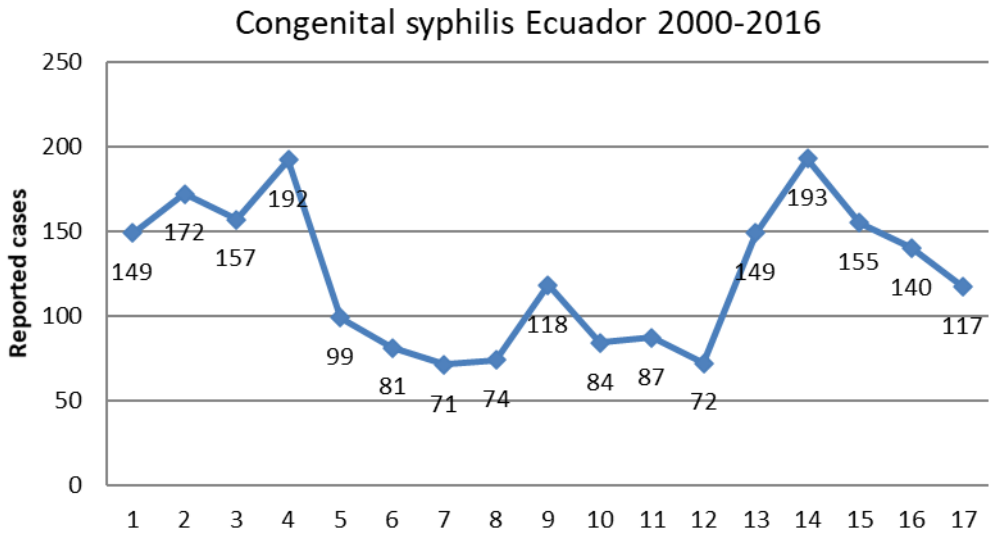

Figure1. Cases distribution by year

Discussion

Prevalence of CS is higher over the rest of groups showed early, late, and other forms of syphilis. This fact was due to lack of prevention around those years in Ecuador. Records presented in year 2008 have a peak that should be analyzed considering the way of registry. Presence of false positive could be questioned due to new diagnostic technics. There should be special attention to the fact data was reviewed over 12 years, 2000 to 2016. This range of time could have higher dispersion of cases number. Statistics analysis of the mean values compared with standard deviation data supports greater reliability of registry from year 2005 (Figure 1).

Since 2006 and forward no report of late syphilis was made. That finding could mean progression of the illness has been stopped giving those records are persistent. That would be ideal, but there is the possibility the cases have been registered somewhere else like other syphilis. In that scenario it would not show diminished prevalence. Other syphilis refers to all survival people who have had illness control. Those people have regular follow up by health personnel. It has not been established if cases presented belong just to people who have been born in Ecuador or come from another country. This is a circumstance that must be presented because of recent immigration to Ecuador [20].

The global predominance of syphilis is attributed to the male population, however the female population stood out in other years. This finding reproduces the analysis of late syphilis until 2005. Considering the previous discussion on reliability, no one can be made. Categorical statement about a higher prevalence. In general terms, although the number of cases in men is higher, the ratio is almost 1: 1 for both sexes [21]. Prevalence in Ecuador regarding to male/female ratio is about the same as published by other countries. In Colombia, in 2020, 777 cases of congenital syphilis were registered, representing an increase of 19% compared to the previous year, with 192 cases of patients from or residents of Venezuela [22]. In 2018 in Peru the incidence of congenital syphilis ranged from 0.3 to 0.5 cases per 1000 live births [23]; in 2019, an incidence of congenital syphilis (including stillbirths) was reported at 0.5 cases or less per 1000 live births, however there are no detailed official data available in recent years.

Most common cause of CS is a deficiency of pregnancy control. Even in largest cities some women do not access to an adequate medical control during pregnancy. Those who get attention not always have the number of medical controls required [24]. There is educational factor involved also related with a low impact in the strategies to accomplish the standards of care. Venereal Disease Research Laboratory (VDRL) is not always performed during pregnancy [25].

The number of cases has an irregular tendency downward. However, analysis made covers 12 years of reports with shortcoming about information and registry. If only statistically reliably data is considered, variation from year 2005 is not significant. It maintains a slight slope declined but media values presented would indicate a plateau during last 7 years. Considerations previously explained should be taken for year 2008 data. The data obtained confirm the proposed plateau on syphilis in Ecuador. Despite the fact that the absolute number of cases has presented an annual rate of decrease in prevalence, it has not undergone such a change in recent years [26].

This determines a blockage on expected descent of cases. Real effectiveness of existing prevention and treatment of congenital syphilis programs is questionable. Possibly, there is not yet adequate follow up of all pregnant women. Perhaps, follow up by health professionals is still deficient [27]. Reasons to explain the unchanged prevalence during specially the last 8 years are initially due to lack of adequate registry of data [28]. There are still some ethnic groups as Native Amerindians, poverty, and lack of enough education, to whom information regarding sexual education and pregnancy control is still insufficient [29]. Other problem is the health promotion is not well understood. To assure prevention, there is a need of better planning and management in public health. Physicians, nurses, medical students, and people related to health system should be involved. Authorities should have a program and monitor its effectiveness [30].

There are many physicians who still gather only at the main hospitals. If the goal to lower cases of syphilis is based on prevention the work remaining will not be at the hospital only. There should be emphasis to go out, educate and make sure it has had an impact on target population. Coordination will be expected from health authorities [31]. CS registry requires background research, clinical abilities to detect characteristic signs and symptoms and adequate diagnosis tests opportunely [32].

Cases reported and presented by the INEC are official. Data is approved by the Ecuadorian government. It was possible to find archives from year 2000 giving that previous information is not complete. Archives in some cases have been eliminated from the virtual database. Although there is some information published in other papers even in Ecuador, only records part of national reference has been taken in consideration for this paper. The rate of CS in the United States reached a low of 8.4 cases per 100.000 live births in 2012 compared with our study Ecuador CS rate was 43.17 cases per 100.000 live births for the same year. In Ecuador, there have been reports on the number of cases in different publications. There are some variations in the numbers presented here. Causes to find some cases which do not coincide with different sources researched can be explained by and inadequate registry of cases or misreport in official sources. Nonetheless, data maintain stated distribution. It is due to this reason analysis don´t vary overall, albeit it could show variations from the statistical point of view [33].

In September 2010, WHO member countries in the region of the Americas approved the Strategy a Plan of Action for Elimination of Mother-to-Child Transmission of HIV and Congenital Syphilis in the Americas (resolution 50/12. 50 Directive Council Meeting); the proposed goals until 2015 were (i) to reduce HIV maternal-to-child transmission to 2% or less (ii) to reduce the incidence of pediatric HIV cases to 0.3 or less per 1000 live births; and (iii) to reduce congenital syphilis incidence including stillbirths) to 0.5 or less per 1000 live births until 2015 [34].

In 2007 the WHO launched a global initiative for the elimination of CS. Furtherly. WHO estimated that in countries with high antenatal syphilis burden allowed to focus efforts in strengthening existing maternal and child health systems infrastructure, an small investment could substantially reduce this global perinatal scourge. Elimination of CS requires a combined commitment of governments and other partners to mount an effective and sustained response [35,36].

WHO has outlined a strategic plan of action for the global elimination of CS is a public health problem. The four-pillar strategy for elimination CS is ensure advocacy and sustained political commitment for a successful health initiative, increase access to, and quality of maternal and newborn health services, screen and treat pregnant women and partners, and establish surveillance, monitoring, and evaluation systems [37].

The global initiative emphasizes that congenital syphilis elimination can contribute directly to three of the Millennium Development Goals by reducing child mortality through reductions in perinatal deaths and low-birth-weight infants; improving maternal health through reductions in late fetal losses and stillbirths and through a decreased burden of syphilis in pregnant women, and combating HIV/AIDS, malaria and other diseases through combined systematic screening for HIV and syphilis in pregnancy with an emphasis on strengthening antenatal and postpartum health systems [12].

Unfortunately, Ecuador is far of this reality. Several barriers currently exist that limit maternal syphilis screening and treatment efforts [38]. Promote maternal syphilis screening and treatment as part of basic antenatal health services its mandatory [39]. In addition, promotes strategies such as incorporating integrated professional training and curricula for health care providers or integrating data systems monitoring [40] it will support to build capacities and it will improve antenatal outcomes.

Current prevalence of CS in Ecuador shows a slight drop, but it is still stationary. Prevention, control and follow up guidelines must be reviewed by health authorities in Ecuador. Standard of care must be known by patients and health personnel. Ecuador will probably not reach the millennium development goals if syphilis remains stationary.

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Conflict of Relations and Activities

The authors declare not to present conflicts of interest and relationships during the conduct of the study.

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