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EPIDEMIOLOGICAL DATA OF PERTUSSIS IN BRAZIL IN THE LAST FIVE YEARS – 2007 TO 2011

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Abstract

Pertussis is an acute infectious disease that affects the respiratory tract. Our objective was to analyze the data on pertussis from 2007 to 2011 available online on the National Information System of Notifiable Diseases – SINAN (Sistema de Informação de Agravos de Notificação). Despite being preventable by vaccination, pertussis still has an incidence of 7.9/100,000 among babies under twelve months, with a lethality rate of 2.4% for this age group. There were no significant differences between sexes. Data analyzed demonstrated a seasonal variation with greater number of cases observed on transition from spring to summer months, October through December. The year 2011 recorded the highest number of cases. The national program of immunization has obtained a great decrease of cases of pertussis and other preventable diseases in children. Nonetheless a greater effort of education and orientation for mothers need to be done to prevent unnecessary deaths.

Keywords: Pertussis; Epidemiology; Brazil.

INTRODUCTION

Pertussis is an acute infectious disease that affects the respiratory tract.⁽¹⁾ *Bordetella pertussis*, a Gram-negative coccobacillus, small and pale, is the agent responsible for the classical whooping cough,^(2,3) an important cause of death in children worldwide specially the ones under one year of age.^(4,5) The triple vaccine DPT (diphtheria, pertussis, tetanus) provides 80% protection against pertussis, which, however, is reduced over time⁵ This study aims to analyze the epidemiology of pertussis in Brazil in the last five years and collect data related to vaccination.

MATERIAL AND METHODS

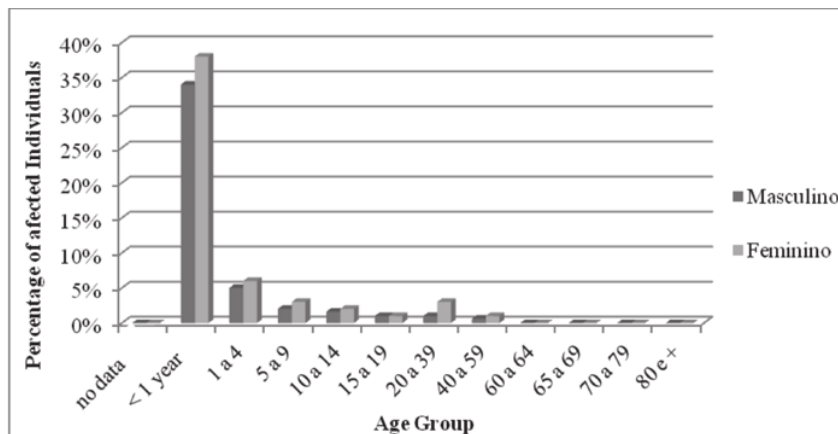
The sample set consists of cases of the disease which were registered in SINAN (Sistema de Informação de Agravos de Notificação)⁽⁶⁾ from January 2007 to December 2011. The data on vaccination were obtained from SI-PNI (Sistema de Informação do Programa Nacional de Imunizações)⁽⁷⁾ and correspond to the period from 2007 to 2010.

Microsoft Excel 2010 software was used to collect and analyze data. Statistical analyzes were performed on GraphPad Prism 5.01, with a confidence interval of 95%.

RESULTS

Between 2007 and 2011, in Brazil, the number of confirmed cases of pertussis was 6058, representing an incidence of 0.79 / 100.000. The incidence was higher in children under one year, reaching 7.9 /100.000. Healing was the result for the majority of reports (88.8%). Higher mortality was found for those under one year of age. The gender difference was not significant ($p > 0,05$) (Figure 1).

Figure 1 – Distribution of Pertussis Cases in Brazil from 2007 to 2011 by Age and Sex.



The highest incidence of cases was in the North Region of Brazil: 4.8/100.000 inhabitants and the smallest one in the Northeast with 2.0 per 100.000 inhabitants. The Southeast presented the highest mortality: (2.6%) and the Midwest the lowest, with 0.5 cases of confirmed pertussis.

There has been a trend of increase in cases over the last four years, and from 2008 to 2011 the increase was over ten times. October, November and December, spring in Brazil, were the months in which there was a greater number of cases, which started to decline in January, a hot summer month.

The data available on the vaccination coverage correspond to the years 2007 to 2010. The resident population in the country, according to the 2010 IBGE sense, was 190.755.799. A total of 29.711.822 vaccines was distributed among the population. Comparing the variation of biological doses applied to the population over the years, the difference was not significant ($p > 0,05$). The region of Brazil that had a greater number of doses distributed was the Southeast, with a percentage of 38%, followed by the Northeast, with 31%, South 12%, North 11% and the Midwest, with 8 %. The percentage of distribution is consistent with the size of the population in each one of these regions.

DISCUSSION

As expected the age group most affected by the disease was infants of one year old or less, since they have not yet completed the basic immunization scheme. With the increase of age, the incidence of the disease tends to decline. There are some reports stating that the immunity conferred by vaccination is not permanent, turning adolescents and adults a group of individuals susceptible to infection, they may present mild or atypical symptoms.⁽⁸⁾ The appearance of mild or no symptoms at all is probably one of the reasons for maintenance of the infection. Asymptomatic persons are without knowing it, a risk for young non vaccinated children, once they are not aware they may have pertussis and yet transmit it.

The clinical course of pertussis is associated with factors such as age and vaccination status.⁽⁹⁾ Among the complications, pneumonia and hypoxic encephalopathy are the ones more associated with lethality; the latter is more frequent in children less than one year.⁽¹⁰⁾

Hyper endemic cycles of the disease occurs approximately every three years, what can explain the significant increase in the number of individuals who became ill in 2011. Regarding monthly variation, it coincides with observations made previously and already described in the literature where there is an increase in cases between spring and summer.^(11,12)

The data of vaccination are useful to monitor whether the goals of the distribution of biopharmaceuticals are being met and if there are people in the population who were not immunized. From the 1990s to the present day vaccine coverage has increased in 2002, the DTP vaccination coverage reached 90%. A household survey showed that rates of vaccine coverage were satisfactory for DTP and Tetravalent.^(13,14) There was a change in the rates of immunization coverage in parts of Brazil, in 1994 it was reported that the lowest rates were in the South and Southeast regions.⁽¹⁵⁾ The pro-

gressive improvement of the system with increasing access to health services through the creation of the SUS has allowed the country to achieve universal coverage for vaccination.⁽¹⁶⁾

CONCLUSION

Epidemiological data have shown a higher incidence of this disease in children under one year, as well as higher mortality in this age group, besides the annual and monthly periods with higher incidence of the disease. These data are consistent with what was found in previous research and elsewhere in the world, after the introduction of the vaccine. The description of cases among Brazilian states, helps direct public health action: children should be the focus of the action immunization against pertussis, since they can progress to a more serious illness and even death. The high prevalence in childhood is an important reason for the implementation of vaccination campaigns and education, in order to alert the public about the symptoms and the need to seek medical assistance for confirmation of diagnosis.

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