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ORIGINAL ARTICLE

Hospitalizations and deaths due to pertussis in children from 1996 to 2013☆

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KEYWORDS
Pertussis;
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Abstract
Objectives: To assess temporal trends of hospitalizations and deaths from pertussis in Brazilian children in the period of 1996–2013.
Methods: This was a descriptive ecological study of temporal trends, based on the DATASUS database. The number of hospitalizations and deaths from pertussis in children up to 19 years of age from January 1996 to December 2013 was obtained. Descriptive statistics were applied for data analysis.
Results: During the study period, a total of 19,047 hospital admissions from pertussis were recorded, of which 88.2% occurred in infants younger than 1 year. In the period 1996–2010, the mean annual number of admissions was 755, ranging from a maximum of 1179 in 2004 to a minimum of 400 in 2010. There was an increase of admissions in the last three consecutive years (2011, 2012, and 2013) with 1177, 2954 and 3589 hospitalizations, respectively. There were 498 deaths from pertussis throughout the study period, of which 96.8% occurred in children younger than one year. There was an increase in the number of deaths from pertussis in children in the years 2011, 2012, and 2013, with 40, 93, and 87 recorded deaths, respectively. The increase in hospitalizations and deaths from pertussis in children occurred in all regions of the country, with the highest increase observed in the Southeast, North and Northeast regions.
Conclusions: There was a substantial increase in hospitalizations and deaths from pertussis in children for three consecutive years (2011, 2012, and 2013) in all Brazilian regions. The most affected age group was that of children younger than one year.

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PALAVRAS-CHAVE
Coqueluche;
Internação;
Óbito;
Estudo ecológico

Internações e óbitos por coqueluche em crianças no período entre 1996 e 2013

Resumo
Objetivos: Avaliar tendência temporal de internações e óbitos por coqueluche em crianças brasileiras no período de 1996 a 2013.
Métodos: Trata-se de um estudo ecológico descritivo de tendência temporal, baseado no banco de dados DATASUS. Foram extraídos os números de internações e de óbitos por coqueluche em crianças até 19 anos de idade no período de janeiros de 1996 a dezembro de 2013. A estatística descritiva foi aplicada para análise de dados.
Resultados: No período estudado foram registradas 19.047 internações por coqueluche, das quais 88,2% foram lactentes menores de um ano. No período de 1996 a 2010, o número médio anual de internações foi de 755, oscilando entre o máximo de 1179 em 2004 e o mínimo de 400 em 2010. Houve um acréscimo de internações nos últimos três anos consecutivos (2011, 2012 e 2013), com 1177, 2954 e 3589 registros, respectivamente. Ocorreram 498 óbitos por coqueluche em todo o período estudado, dos quais 96,8% eram menores de um ano. Houve acréscimo no número de óbitos por coqueluche em crianças nos anos 2011, 2012 e 2013, com 40, 93 e 87 registrados, respectivamente. O aumento de internações e óbitos por coqueluche em crianças ocorreu em todas as regiões do país, havendo maior acréscimo nas regiões Sudeste e Norte-Nordeste.
Conclusões: Houve um aumento substancial de internações e de óbitos por coqueluche em crianças por três anos consecutivos (2011, 2012 e 2013) em todas as regiões brasileiras. A faixa etária mais atingida foi a de menores de um ano.

Introduction

Pertussis is a highly infectious and contagious human respiratory disease caused by the coccobacillus *Bordetella pertussis*. Although it is a vaccine-preventable disease, pertussis remains an important cause of child morbidity and mortality worldwide, and a source of public health concern, even in countries where vaccination coverage is high.[1–3] According to the World Health Organization (WHO), there were approximately 16 million cases of pertussis in the world in 2008, with 95% occurring in developing countries, causing about 200,000 infant deaths.[1]

In many developed countries with high vaccination coverage, pertussis has re-emerged in the last two decades with increasing incidence, especially among young infants not yet fully immunized, as well as adolescents and young adults who are potentially capable of transmitting the disease to younger children.[2–5] Some hypotheses have been considered for the resurgence of the disease, such as loss of acquired immunity during the time after vaccination, reduced vaccine effectiveness, use of new diagnostic methods, improved epidemiological surveillance systems, and genetic changes in bacteria.[2,5,6]

In Brazil, data from the Ministry of Health's epidemiological surveillance show an increase in the incidence of pertussis since 2011, after over a decade of stability.[7] Approximately 70% of cases were children younger than 1 year, with most younger than 3 months.

Due to the difficulties in the clinical diagnosis and lack of availability of sensitive and specific laboratory tests, pertussis remains an underdiagnosed and underreported disease.[6,8,9] Accurate data on the incidence rate of this disease are difficult to obtain, particularly in developing countries. Therefore, studies on hospital morbidity and mortality from pertussis can provide important additional information in assessing the current national epidemiological situation of the disease.

This study aimed to describe temporal trends in hospital admissions through the Brazilian Unified Health System (Sistema Único de Saúde [SUS]) and deaths from pertussis in Brazilian children up to 19 years of age, from 1996 to 2013. The direct costs of hospitalization from pertussis through SUS in 2013 were also calculated.

Methods

This was a descriptive ecological study of temporal trends, based on the database of the Brazilian Unified Health System Informatics Department (DATASUS). This study involved only public-domain data that do not identify the participants and, therefore, did not require approval by the Research Ethics Committee.[10] The numbers of hospitalizations and number of deaths from pertussis, as well as the number of hospitalizations from all causes in children aged up to 19 years were obtained from January 1996 to December 2013. The choice of the studied period, 1996–2013, is justified as the Tenth Revision of the International Classification of Diseases (ICD-10) was implemented in Brazil in 1996. Data on the total amount paid by SUS for hospitalizations from pertussis in 2013, the mean amount paid per admission, and the length of hospitalization (in days) for this disease were also obtained.