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Original article

Vaccination coverage against pertussis in pregnant women of Catalonia in the first year of implementation of the immunisation program☆

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ABSTRACT

Introduction: The re-emergence of pertussis and the severity of its complications in infants younger than 3 months were determining factors for starting a vaccination program for pregnant women in the third trimester of gestation in Catalonia in February 2014. This was the first autonomous community to introduce it in Spain. The aim of the study was to estimate the coverage of the program in its first year of implementation.
Methods: A retrospective analysis was performed on the data from the Primary Care Centre computerised medical records of pregnant women attending Sexual and Reproductive Health Care centres of the Metropolitan Nord area of the province of Barcelona, part of the Catalan Institute of Health. The overall coverage was estimated, as well as the sociodemographic variables of Tdap vaccination of women who had registered a delivery of a live birth between August 2014 and August 2015.
Results: A total of 6697 deliveries of live births were recorded, and 1713 pregnant women were vaccinated, which represented an overall coverage of 25.6% (95% CI; 24.1–26.1). Vaccination coverage was higher in pregnant women under 18 years and Spanish women ($p = 0.018$ and $p = 0.036$, respectively).
Conclusion: The estimation of vaccine coverage against pertussis in pregnant women in the third trimester of pregnancy, after the first year of implementation of the program in a health area of Catalonia was lower than the objective set. Strategies need to be designed in order to improve program coverage.

Cobertura vacunal frente a tos ferina en gestantes de Cataluña en el primer año de implantación del programa de inmunización

Palabras clave:
Vacunación tos ferina
Embarazo
Cobertura vacunal

RESUMEN

Introducción: La reemergencia de la tos ferina y la gravedad de sus complicaciones en lactantes menores de 3 meses de edad determinó el inicio del programa de vacunación de las mujeres embarazadas en el tercer trimestre de gestación, en Cataluña en febrero del 2014, la primera comunidad autónoma que la introdujo de España. El objetivo del estudio fue estimar la cobertura del programa en su primer año de implementación.

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Métodos: Se analizaron de forma retrospectiva los registros médicos informatizados de los Centros de Atención Primaria de embarazadas atendidas en centros de Asistencia de Salud Sexual y Reproductiva del área Metropolita Nord de la provincia de Barcelona, dependientes del Institut Català de la Salut. Se estimó la cobertura global y según variables sociodemográficas de vacunación con dTpa de las mujeres que tenían registrado un parto de un recién nacido vivo entre agosto del 2014 y agosto del 2015.
Resultados: Se registraron 6.697 partos de nacidos vivos y 1.713 mujeres embarazadas fueron vacunadas, lo que representó una cobertura global del 25,6% (IC del 95%: 24,1-26,1). La cobertura de vacunación fue mayor en las mujeres embarazadas menores de 18 años y las nativas (p = 0,018 y p = 0,036, respectivamente).
Conclusión: La estimación de cobertura vacunal frente a tos ferina de embarazadas en el tercer trimestre de gestación, tras el primer año de implementación del programa en un área sanitaria de Cataluña, ha resultado inferior al objetivo marcado. Será necesario diseñar estrategias dirigidas a mejorar la cobertura del programa.

Introduction

Pertussis is a highly contagious infectious diseases, which has been re-emerging in recent years in most countries and causing high morbidity and mortality.[1] In most cases the severity of pertussis and its complications in infants requires hospitalisation and the death rate is high.[2,3] Vaccination is the best form of prevention, but the immunity conferred by presenting the disease and by vaccination is of limited duration. In Catalonia, the calendar of systematic vaccinations offers 5 doses of the vaccine (at 2, 4, 6 and 18 months and a booster dose at 4–6 years) with a diphtheria, tetanus and acellular pertussis component since 2002.[4]

The re-emergence of pertussis, with major outbreaks in many countries, such as those in California and England, and causing a notable increase of deaths in infants under the age of 3 months, has led to the introduction of new prevention and control strategies.[5] Contact studies[6,7] show that parents and household members are the principal sources of contagion to infants who have not yet their started primary vaccination course. It is now suggested that pregnant women in the third trimester should be vaccinated as the most effective and efficient strategy to protect newborns who have not yet started primary vaccination. This strategy has been shown to be safe and effective in preventing other infectious, vaccine-preventable diseases, such as tetanus or flu.[8] The transfer of antipertussis antibodies to the foetus via the placenta will protect the neonate until vaccination starts at 2 months old. The mother will also be protected, which will also provide indirect protection to the newborn child. One single intervention will protect mother and newborn without increasing the risk of adverse effects.[9]

In a recent study in Catalonia,[10] more than 94% of the children of mothers who were given a dTpa vaccine dose during the second or third trimester of their pregnancy presented higher levels of antibodies than those of the mothers who were not.

The programme for vaccinating pregnant women with one dose of dTpa between gestation weeks 27–36 was introduced in the United States in October 2011. Vaccine coverage in 2012 was less than 20%,[11] and only 25% of the pregnant women who gave birth in 100 hospitals in California in October 2013 were given a dose of dTpa during pregnancy.[12]

Vaccinating pregnant women between gestation week 28 and 38 was recommended in October 2012, and achieved 64% coverage in the first year it was implemented.[13] The effectiveness of maternal vaccination in preventing pertussis in children under the age of 2 months has been estimated at 91%.[14]

In Spain, the incidence of pertussis increased from 1.9 cases per 100,000 inhabitants in 2010 to 7.17 cases per 100,000 inhabitants in 2014.[15] In children under one year, the incidence reached 226.58 cases per 100,000 inhabitants in 2014.[16] The hospitalisation rate for pertussis did not exceed 100 hospitalisations per 100,000 children under one year of age up until 2000. However, from 2011, there were more than 200 hospitalisations per 100,000 in the majority of the autonomous communities.[15] In Catalonia, the overall incidence rate was 13.5 cases per 100,000 inhabitants in 2014.[17] In the period from 2000 to2013 there were 40 deaths among the cases notified, of 39 of which were children under the age of one year.[15] This situation prompted consideration of the need to implement additional vaccination strategies.[18]

The programme for vaccinating pregnant women was started in Catalonia in February 2014. Catalonia was the first autonomous community to introduce this. The objective was to achieve 50% vaccination coverage in the first year. Information was provided via information sessions, and technical guidelines and information material was given out to the healthcare professionals involved in monitoring the pregnant women. All the professionals involved in prenatal care, midwives and obstetricians, received information on the recommendation to vaccinate expectant mothers in each pregnancy, ideally between gestation weeks 27 and 36.[18]

Because there is no official registry to enable monitoring of the vaccination coverage of pregnant women, we considered it appropriate to use indirect information sources, such as the electronic health records registries available in the sexual and reproductive health centres (ASSIR). The objective of this study was to estimate coverage of the programme in its first year of implementation to assess whether additional strategies are required to improve results.

Methods

Data was analysed retrospectively from the computerised clinical record registries of primary care centres (e-CAP) of pregnant women who attended the 7 ASSIR centres of the province of Barcelona's North Metropolitan Area, which is under the authority of the Catalan Health Institute (ICS). This area includes the 1,383,039 inhabitants of the 71 municipalities of Vallés Occidental, el Vallés Oriental, el Barcelonés and el Maresme. The population of the health area studied is spread over a large geographical area with includes large metropolitan as well as small rural areas, with a proportion of women of fertile age similar to that of the population of Catalonia.[19] During 2014, a total of 18,338 deliveries were recorded in this health area, of which 14,336 (77.7%) took place in Integrated Public Use Healthcare System of Catalonia (SISCAT) hospitals and the remainder in private hospitals. Eleven thousand, four hundred and forty-one expectant mothers were monitored in the area's ASSIR centres, but information was available for only 6697 live births (58.5%) to mothers who attended the postnatal monitoring visit.