



Re-emergence of Pertussis- A Global Perspective

Rajasree Pai R^{1*} and Raghesh Varot Kangath²

¹MD, Resident, Department of Internal Medicine, University of Connecticut, Farmington, USA

²MD, Fellow, Department of Infectious Diseases, Texas A & M University, USA

Pertussis also known as whooping cough is a bacterial infection of the upper and lower respiratory tract caused by the Gram negative bacterium namely *Bordetella Pertussis*. The disease mainly affects children, but also can affect adolescents and adults. Symptoms include bouts of cough leading to shortness of breath at times followed by a “whooping” sound created by sucking in air.

Pertussis became a reportable disease in 1922. The disease is transmitted by air borne droplets, prevented by DTaP (Diphtheria, Tetanus and acellular Pertussis) vaccination and treated with erythromycin. Children receive up to 5 vaccinations by age 5 to complete the vaccination series. Whole Cell Pertussis vaccine was established in 1940s in most industrialized countries and as a result there was a 99% decline in the disease in the United States in the subsequent decades reaching its lowest in 1976.

Despite the presence of an effective vaccine for primary prevention, Pertussis is the only vaccine preventable disease on the rise in the last twenty years in the United States. Most of the outbreaks begin in adolescent and adult groups and then get transmitted to infants by air, killing infants who are not yet old enough to receive the entire vaccine series. There is a reported increase in percentage of infants affected going up by 6 fold in the post immunization era as compared to the pre-vaccination era. CDC reports 7,867 confirmed cases worldwide in the year 2000 as opposed to 1,010 cases in 1976 [1]. 9143 cases were reported in California in 2010 with ten infant deaths and 2092 cases in Washington in 2011 still on the rise as reported by the Center for Diseases Control.

Is this re-emergence real or is it an impact of the increase in surveillance, improvement in diagnosis in the adult population? Several studies indicate that the number of cases occurring every year is clearly in excess of the expected fluctuations from reporting of cases and diagnosis.

The reason for re-emergence of pertussis as a public health problem in the last 2 decades since 1990 is mostly unclear. There are some reports about isolate polymorphism and antigenic divergence between vaccine and wild strains [2] in the highly vaccinated populations like the Netherlands leading to the unexpected outbreak of the disease in 1996. However, there is no clear data to support the same. The other possible explanations include alterations in the epidemiology and transmission patterns of the disease and possible waning of protective immunity in adults as reflected by the rise in the disease among the adolescent and adult populations. The immunity levels are questionable after the first decade of procuring the vaccine. Pertussis in adults is often underdiagnosed due to presence of subclinical disease and difficult diagnosis by culture methods.

Another concern is refusal of Pertussis vaccination by parents of young children under the assumption that their children are not at risk of developing a vaccine preventable disease in an industrialized country. There are reports suggesting that non-immunized children are at 23 fold risk of developing Pertussis than vaccinated children in the industrialized countries.

Several studies have suggested that the most important source of infection to infants is from mothers, followed by adolescents, grandparents and health care workers. There were a few initial concerns about risks to adults outweighing the benefits from the vaccine. After clinical trials, some of which are still underway regarding vaccine safety, acellular pertussis component was added to diphtheria and tetanus vaccination for adults to receive it every decade. There are some encouraging results about boosting of pertussis immunity by re-vaccinations in the adolescent and adult groups influencing the epidemiology of the disease and its transmission to infants.

CDC is now recommending “cocoon” vaccination to parents and immediate care givers of infants in an attempt to protect the infants from Pertussis until they are old enough to complete the vaccination series. The recommendation also involves vaccination with a booster of DTaP instead of DT vaccination for adults to raise partial herd immunity. Newer vaccines might need to be developed to cover the antigenic variabilities of the bacterial strains if the studies on the same suggest antigenic polymorphism as a major cause of concern in the coming years. Educating health care workers on re-emergence of the disease and prompt diagnosis of Pertussis might help to prevent the disease earlier before spreading the airborne disease in the community.

Reference

1. CDC Pink Book, 7th Edition of Epidemiology and Prevention of Vaccine-Preventable Diseases.
2. Pertussis--United States, 1997-2000, “Morbidity and Mortality Weekly Report.

*Corresponding author: Rajasree Pai R, Department of Infectious Diseases, Texas A & M University, USA, E-mail: drrajashree.pai@gmail.com

Received June 14, 2012; Accepted June 14, 2012; Published June 16, 2012

Citation: Rajasree Pai R, Kangath RV (2012) Re-emergence of Pertussis- A Global Perspective. Air Water Borne Dis 1:e114. doi:[10.4172/2167-7719.1000e114](https://doi.org/10.4172/2167-7719.1000e114)

Copyright: © 2012 Rajasree Pai R, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.