

# The Knowledge Levels of Pediatricians about the Vaccination against Pertussis

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## Abstract

**Objective:** This study aimed to assess the knowledge and attitude levels of pediatricians in terms of the pertussis vaccine.

**Materials and Methods:** A survey study was carried out to evaluate the knowledge and attitude levels of pediatricians working in Istanbul in terms of the pertussis vaccine between May 1, 2015 and July 1, 2015.

**Results:** A total of 104 pediatricians who comprised of 53 male and 51 female physicians, participated in this study. It was found that 35.6% of them at low-level, 51% at middle-level and 13.5% at a high-level of knowledge. The knowledge-level scores of the pediatricians who had children were significantly higher than those of pediatricians who had not a child on pertussis vaccine. Moreover, the knowledge-level scores of the specialist doctors in terms of the pertussis vaccine were significantly higher than those of the assistant doctors. It was significant that pediatricians who had children suffering from chronic diseases had greater knowledge-level scores in terms of the pertussis vaccine than those who had children without any disease.

**Conclusion:** The knowledge and awareness of physicians in terms of the pertussis vaccine should be increased with in-service trainings, as the surveyors presented an insufficient knowledge level.

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## Introduction

Pertussis is an acute respiratory infection characterized by persistent and spasmodic coughing attacks<sup>1</sup>. Sydenham had firstly used the term pertussis (intense cough) in 1670; it is preferred to the term "whooping cough"<sup>2</sup>. Across the world, there are more than 60 million cases of pertussis on a year-to-year basis, resulting in more than 500,000 deaths. Before the vaccination, between the years of 1922 and 1948 pertussis was the leading cause of infectious diseases in children under the age of 14 years in the United States. The common use of pertussis vaccine has led to more than 99% reduction in cases. The frequency of pertussis and recurrence in developing countries where vaccination rates were low remained to be high<sup>2</sup>. Pediatricians consider pertussis as a childhood disease and the possibility of pertussis in adolescents and adults is often not taken into account<sup>3,4</sup>.

In this study, we aimed to assess the knowledge level of physicians who work at the department of pediatrics in terms of the vaccine against Pertussis, which still poses an important public problem. We aimed to raise awareness about pertussis and to reveal that the pertussis can occur not only in children, but also in all age groups.

## Material and Methods

A survey study was carried out to evaluate the knowledge levels of pediatricians working at hospitals that belongs to the Beyoğlu General Secretariat of Public Hospitals Association in Istanbul in terms of the pertussis vaccine between May 1, 2015 and July 1, 2015. The study was carried out with the permission of the Ministry of Health Istanbul Okmeydani Education and Research Hospital Ethics Committee dated 03.02.2015 and numbered 278. The pediatricians were informed about the aim and content of the study and those who wanted to be volunteer were included in the study.

The socio-demographic characteristics such as age, gender, marital status, smoking status, and chronic illness status as well as pertussis vaccine were asked to of physicians who work at the department of pediatrics in the questionnaire. These questions were as follows;

### *General Questions about the Pertussis Vaccine;*

- Do you know the type of the pertussis vaccine?
- Do you know how to apply the pertussis vaccine?
- Do you know how many times children get acellular pertussis vaccine until they start school in our country?
- Do you know in which months acellular pertussis vaccine is applied based on the current vaccination calendar of the Ministry of Health?

### *Questions about Adult Pertussis Vaccination;*

- Do you think adult-type pertussis vaccine should be included in the vaccination program of the Ministry of Health?
- Should an adult who got completely vaccinated in the childhood get pertussis vaccines periodically?
- Do you know which way the adult-type pertussis vaccine is implemented?
- Do you think there is an adult-type pertussis vaccine in Turkey?
- Do you think pregnant women can get an adult-type pertussis vaccine?

### *Questions about Pertussis Disease;*

- Do you think the frequency of pertussis disease has increased in recent years?
- Have you heard of the current 'cocoon strategy' about pertussis?

The data obtained has been assessed based on NCSS (Number Cruncher Statistical System) 2007 (Kaysville, Utah, USA). The Mann-Whitney U test has been utilized to compare the parameters of two groups that showed the abnormal distribution in the comparison of descriptive statistical methods (average, standard deviation, median, frequency, and rate, minimum, maximum) as well as the comparison of quantitative data. Spearman's correlation analysis has been used for the inter-parameter relationship assessment. Significance has been evaluated at the levels of  $p < 0.05$ .

## Results

A total of 104 pediatricians who comprised of 53 (51%) male and 51 (49%) female physicians,

participated in this study. The mean age of physicians was  $31.25 \pm 7.05$  years (Range: 24- 56 years). The mean vocational time of 104 physicians was  $4.49 \pm 6.26$  years (Range: 0.08 - 27 years). The knowledge level of physicians ranged from 5.6 to 88.9 points. The mean points were  $45.30 \pm 19.85$  among surveyors and the median value was 44.4 points. The knowledge level of physicians was found to be low in 37 physicians (35.6%), moderate in 53 (51%) and high in 14 (13.5%) in terms of the pertussis vaccine.

The physicians answered the question of whether they know on which months acellular pertussis vaccine is applied based on the current vaccination calendar of the Ministry of Health with yes by 63.5% (n = 66) of them and no by 36.5% (n = 38). The physicians answered the question of whether they know which way the pertussis vaccine is implemented with intramuscularly by 76% (n= 79) of them, intravenously by 2.9% (n= 3), intradermal by 6.7% (n= 7), subcutaneously by 12.5% (n= 13) and oral by 1.9% (n= 2). It was recorded that 39 (37.5%) of the physicians said yes, and 65 (62.5%) physicians said no to the question of whether there is an adult-type of pertussis vaccine in Turkey. The question of whether they had heard of the current 'cocoon strategy' about pertussis was responded by the physicians with yes by 43% (n = 45) and no by 57% (n = 59).

The physicians answered the question of whether they know how many times children get acellular pertussis vaccine until they start school in our country with 3 times by 32.6% (n = 34) of physicians, 4 times by 49% (n = 51), 5 times by 16.3% (n = 17) and 6 times by 1.9% (n = 2).

The mean knowledge-level score of the pediatricians was  $52.45 \pm 20.25$  points (n=34) and of the childless pediatricians was  $41.82 \pm 18.84$  points (n=70). A significant difference was found statistically between the knowledge-level scores of the pediatricians and having of a child (p= 0.010).

The mean knowledge-level scores of the pediatric specialists and pediatric assistants were  $42.24 \pm 19.40$  points and  $57.40 \pm 17.16$  points in terms of pertussis vaccine, respectively. There was found a statistically significant difference between

knowledge-level scores and being a pediatric specialist (p = 0.001).

The mean knowledge-level score of the physicians with no chronic disease was  $44.51 \pm 19.92$  points, while of those suffering from chronic disease were  $49.64 \pm 19.51$  points. There was no statistically significant difference between those scores (p = 0.304).

The mean knowledge-level score of the married physicians in terms of pertussis vaccine was  $49.90 \pm 19.49$  points on average, while of single/divorced physician assistants was  $40.13 \pm 19.15$  points on average. A statistically significant difference was determined between knowledge-level scores and a marital status of physicians (p = 0.008). A statistically significant correlation was observed between the age of physicians and the knowledge about pertussis vaccine (the knowledge-level increases with age) (r = 0.197, p = 0.045).

## Discussion

The knowledge level and attitudes of pediatricians play a crucial role in the prevention and treatment of pertussis. When the knowledge level of the pediatricians participating in the survey on influenza vaccine conducted by Ciblak and et al<sup>5</sup> was examined, 4.1% of surveyors was determined to have low-level, followed by 20.6% with middle-level score and high score with 75.3%. The development of strategies, such as the close follow-up of immunization rates and implementation of childhood vaccination schedule as well as a cooperation between family physicians and pediatric physicians that provides the right communication with the parent, are important to achieve the targeted rates in the vaccination.

Some pediatricians failed to know how to apply the pertussis vaccine, so that might cause a harm whilst working life as a result of the wrong implementation. On the one hand, reducing the error rates as low as possible during vaccination, on the other side, maximizing the compliance rates to expecting levels are crucial to at the participation of the public in the vaccination program<sup>6</sup>. The knowledge levels of pediatric physicians in terms of pertussis vaccine that were not in the upper level in our study should be raised up with the regular in-service trainings. The acellular pertussis vaccine, which is called as "the adult type pertussis

vaccine" was not known by 62.5% of the pediatric physicians participating in our study. A reduction of interest about this vaccine might occur as a result of having a misinformation and perception about pertussis (whooping cough) that occurs only in children <sup>7</sup>. However, infected adolescents and adults could be also a source of infection for infants who are unvaccinated or vaccination processes are in progress <sup>8</sup>.

Pertussis factor in the nasopharyngeal nasal aspirate was found to be positive by PCR in 12 of 26 patients (46%) who were hospitalized with a clinical presentation of whooping cough between February and July 2010 at a pediatric infection clinic in Istanbul <sup>9</sup>. The youngest patient was reported to be 40 days old. When the presence of coughing lasting the minimum of two weeks was questioned in individuals contacting with family members, fathers of three patients, mothers of four patients and both mother and father of two patients and siblings of three patients were determined to have a similar coughing story <sup>9</sup>. A newborn who was 19 days old and from Ankara was admitted to a newborn intensive care unit due to pertussis that the source of the infection was determined to be the mother of the baby <sup>10</sup>. Cocooning is defined as the strategy to protect infants from infectious diseases, especially from pertussis, by vaccinating people in close contact with children <sup>11,12</sup>. It is remarkable that the knowledge levels of physicians about the cocoon strategy were very low. This issue should be brought to the agenda with seminars and information tools to increase the knowledge levels of pediatric physicians.

Half of surveyors correctly responded the question of how many times children get acellular pertussis vaccine until they start school in our country. The fact that pediatric physicians could not respond as much as expected in the question of how many times and in which months the pertussis vaccines are implemented on the children, is pointing out that the education of pediatric physicians should to be questioned and improved eliminating deficiencies.

As a result, the fact that the knowledge levels and awareness of pediatric physicians should be raised up in terms of pertussis vaccine and disease that can affect all age groups in spite of a childhood disease and

causes a severe morbidity, by in-service trainings and other programs.

### Conflict of Interest

There is no conflict of interest.

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