Exploration of Asthma & Allergy

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Rising cases of pertussis in Albania: should we review our vaccination strategies?

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Academic Editor: Michele Miraglia Del Giudice, University of Campania, Italy
Received: January 22, 2025 **Accepted:** April 21, 2025 **Published:** May 14, 2025

Cite this article: Borici S, Hyseni B, Akshija I. Rising cases of pertussis in Albania: should we review our vaccination strategies? Explor Asthma Allergy. 2025;3:100982. https://doi.org/10.37349/eaa.2025.100982

Abstract

Since January 2024, in Albania, we have noted an increased number of visits because of *Bordetella pertussis* affecting all age groups. The increased numbers reflect increased circulation of *Bordetella pertussis* in Albania. Increasing cases of *Bordetella pertussis* are noticed in different European countries (European Centre for Disease Prevention and Control. Increase of pertussis cases in the EU/EEA. 2024.), and its appearance represents a public health problem to be addressed correctly such as introducing the booster dosage of *Bordetella pertussis* vaccine in the preschool, teenagers and pregnancy, identifying the contacts and early beginning of post-exposure prophylaxis are very important for preventing the burden of *Bordetella pertussis* and its fatalities.

Keywords

Bordetella pertussis, children, vaccination

Methods

This observational study included 172 consecutive outpatients suspected of having pertussis in Albania. The period of the study is from January 2024 to mid-August 2024. The patients presented with a protracted-paroxysmal cough, which didn't respond to therapies as inhaled corticosteroids, antihistamines, or augmentin; furthermore, it got worse. The patients were referred to the respiratory consultant by the family doctor because of the protracted cough. Based on the clinical signs of the disease, the patients were suspected of having pertussis, and they underwent blood serology for *Bordetella pertussis*. The serology was performed for all the patients over 4 months old, meanwhile, the children under 4 months old suspected of pertussis were investigated by doing *Bordetella pertussis* serology on the suspected close contacts. Serology was considered positive in patients who had positive IgG or IgM, and both IgM and IgG. The tests are done using the chemiluminescence immunoassay (CLIA) method. *Bordetella pertussis* IgG

were considered positive > 100 IU/mL and/or *Bordetella pertussis* IgM ≥ 12 IU/mL. *Bordetella pertussis* IgG 40–100 IU/mL are considered borderline (or grey). In infants who received three doses of the vaccine, elevated levels of IgG and IgM were attributed to infection rather than immunization when they had identified close contacts and clinical data of pertussis infection.

Statistical analysis is performed using the statistical software package IBM SPSS version 26.0. Data is summarized as frequencies and percentages for categorical variables, and for continuous variables is used mean and standard deviation (mean ± SD), binary logistic regression, Pearson's correlation coefficient (r), and ANOVA test. A p-value of < 0.05 is considered statistically significant.

Results

A total of 82 cases were confirmed by serology. The distribution of cough duration until they presented at the specialist ranged 1.5–4 weeks, mean of 2.96 weeks and, median of 3 weeks. It is noted a relatively even spread of cough durations, with most values clustered between 2 to 4 weeks.

Figure 1 shows the frequency of *Bordetella pertussis* cases according to sex and age. It is observed the presence of *Bordetella pertussis* in all age groups: infants, preschool-school age, adolescents, and adults for both sexes. The interquartile range of the patients: 1 month–61 years, median age was 10.58 years.

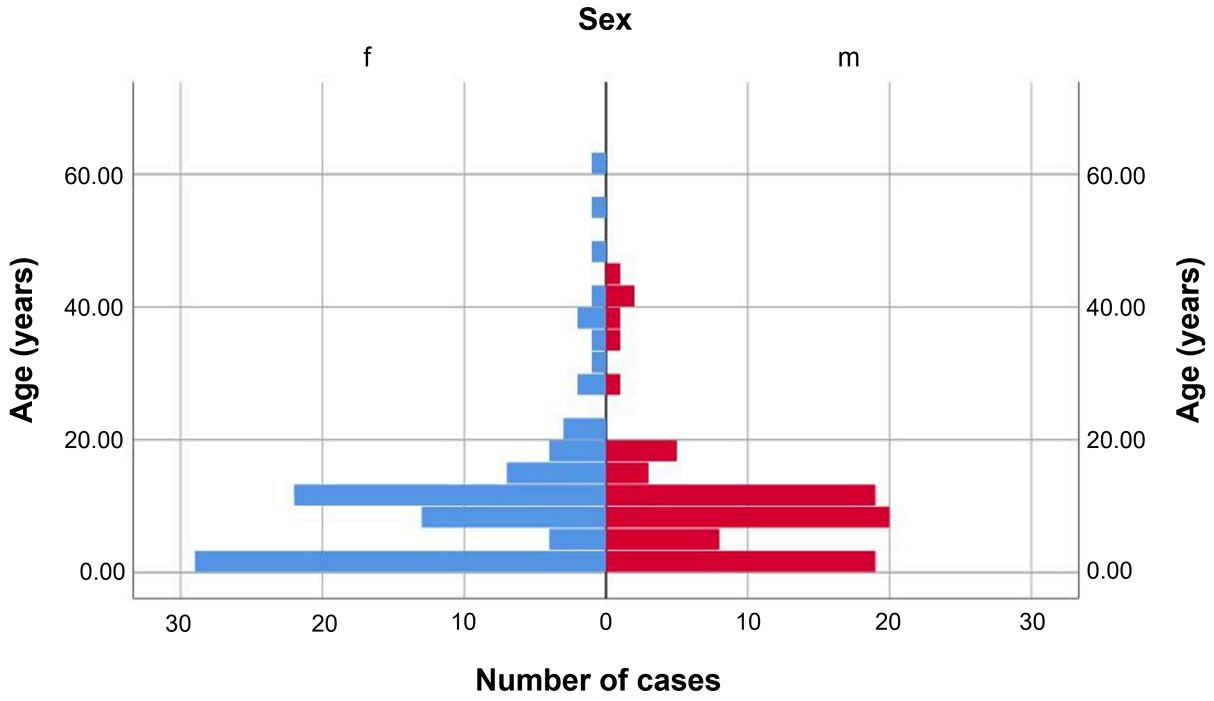

Figure 1. Distribution of *Bordetella pertussis* cases according to sex and age. f: females; m: males

The distribution of cases according to months is shown in Figure 2. The incidence of *Bordetella pertussis* was higher in February, March, and April. Females were 53%, and 47% were males.

We studied whether it exists any correlation between age and cough duration (Figure 3), resulting in a small negative correlation, but unsignificant: $N = 44$, $r = -0.23$, $p = 0.881$. We didn't find any relationship between age and duration of cough with sex.

Age and cough days were tested for normality. Kolmogorov-Smirnov test: age (statistic = 0.216, $p > 0.01$) and cough days (statistic = 0.239, $p > 0.01$). Both variables were normally distributed.

82 patients resulted in having a positive serology: 22.3% IgM positive, 58.9% IgG positive, 18.8% IgM and IgG positive.

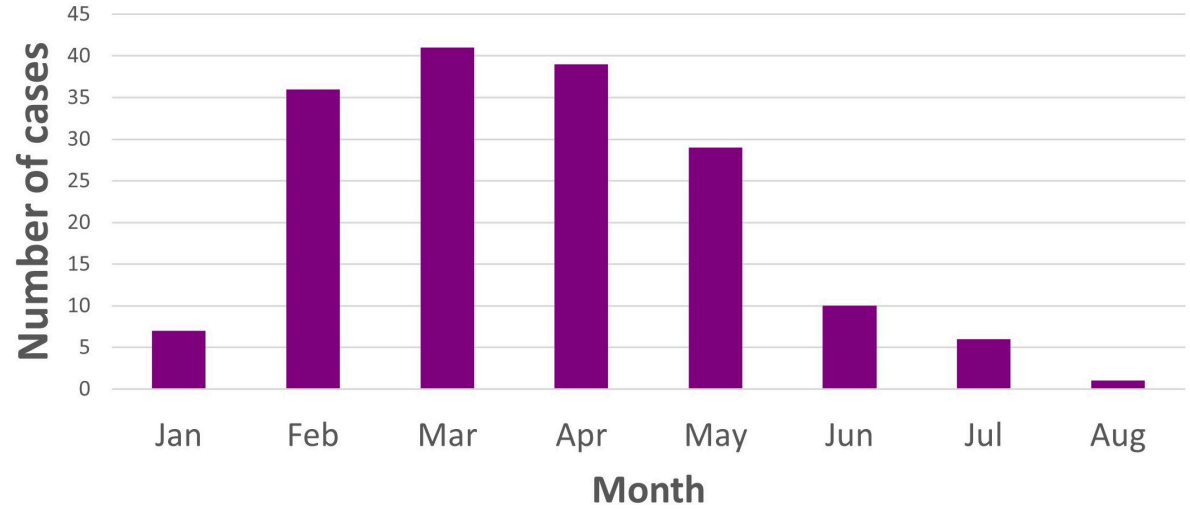

Figure 2. Distribution of *Bordetella pertussis* cases according to months

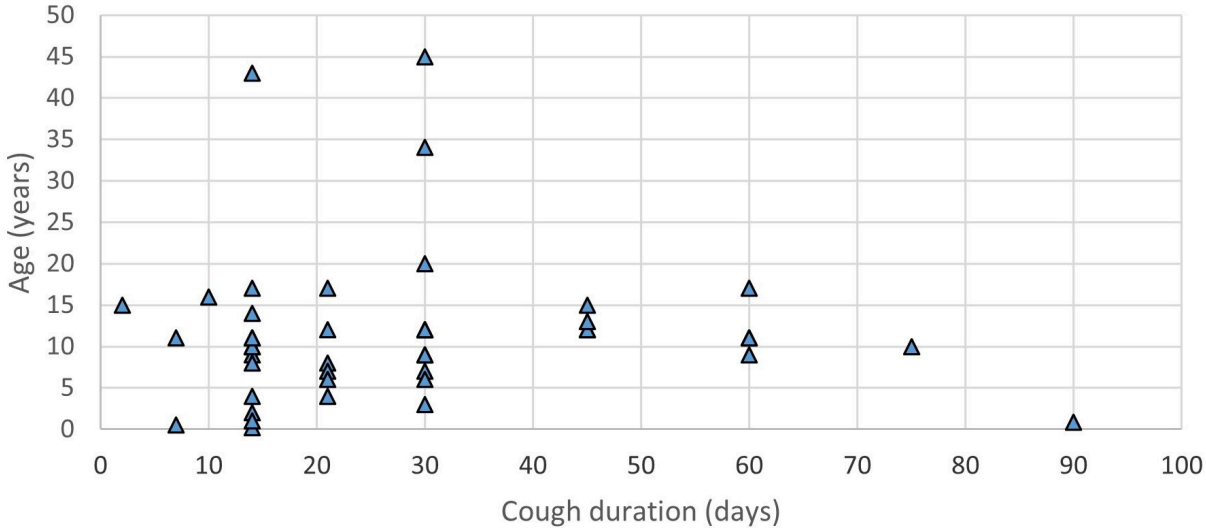

Figure 3. The relation between age and cough duration

Binary logistic regression was performed to study the correlation between *Bordetella pertussis* IgM and age, sex, and cough duration days, which resulted statistically unsignificant, $p = 0.545$. Females have 1.7 more chances, but it's unsignificant, $p = 0.445$.

ANOVA test was performed to study the correlation between *Bordetella pertussis* IgM and IgG with age and cough duration days, which resulted in no correlation between them (Figure 4a and 4b). Respectively, $F = 2.156$; $p = 0.130$; $F = 1.329$; $p = 0.268$. Maybe greater numbers are needed.

Discussion

Whooping cough is a bacterial infection that affects the respiratory tract. In the first days after infection, the patients may have nonspecific symptoms as nose congestion and sore throat. Several days later begins the cough which gradually progresses to cough paroxysms, which get worse during the night [1]. In small babies, the cough may have the characteristic "whoop" or may experience breathing difficulty or apnea. The diagnosis of pertussis in this age group may be challenging.

Pertussis is an infectious disease that circulates and peaks every 3–5 years [2]. During the pandemic period were noticed low numbers of pertussis, may be because of the strict measures of social distancing. Peak numbers of *Bordetella pertussis* after pandemic may also be because of reduced immunity in all age groups. In Albania, we perform whole-cell vaccines against *Bordetella pertussis* in children at 2, 4, and 6 months of age and at 2 years [3]. We don't perform *Bordetella pertussis* vaccines in pregnant women, and

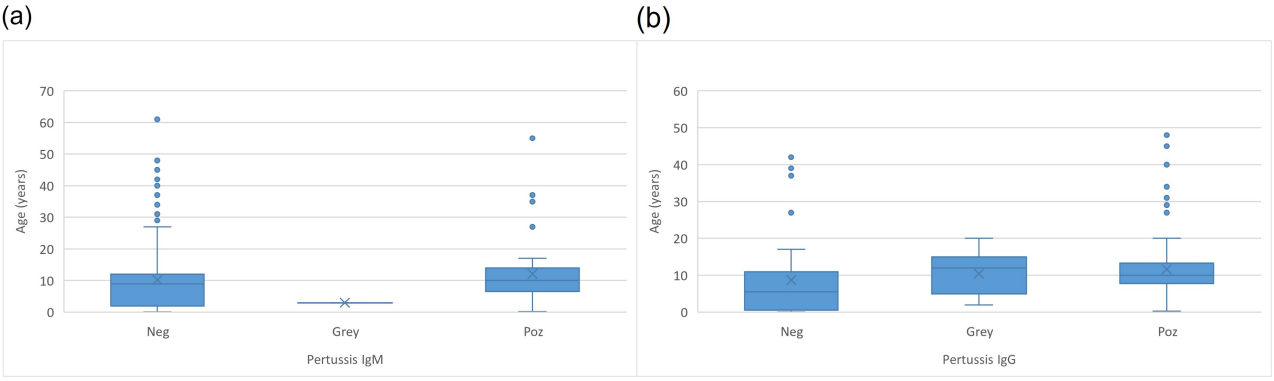

Figure 4. The correlation of *Bordetella pertussis* IgM and IgG with patients' age by ANOVA analysis. (**a**) The relation between *Bordetella pertussis* IgM and the age of the patients. (**b**) The relation between *Bordetella pertussis* IgG and the age of the patients. Grey means IgG levels from 40–100 IU/mL. Solid blue circles represent outliers

we don't perform booster dosages in school-age children and adolescents. *Bordetella pertussis* can affect all age groups, but this infection may be life-threatening for small babies. Vaccination is the best defense against *Bordetella pertussis*, and it is very important to include the vaccine for pregnant women in the national immunization schedule, and also to include the booster dosages for school-age, adolescents, and adults. In order to prevent the spread of the disease, it is recommended for patients diagnosed with *Bordetella pertussis* to stay home 5 days after starting antibiotics, or three weeks after the beginning of the symptoms in case they have not used antibiotics, and also early treatment of the contacts [4].

Declarations

Author contributions

SB and BH: Conceptualization, Investigation, Writing—original draft, Writing—review & editing. IA: Validation, Writing—review & editing, Supervision. All authors read and approved the submitted version.

Conflicts of interest

The authors declare that they have no conflicts of interest.

Ethical approval

Ethical approval was not required for the study on human participants in accordance with the local legislation and institutional requirements.

Consent to participate

Informed consent to participate in the study was obtained from all participants or guardians of underage participants.

Consent to publication

Not applicable.

Availability of data and materials

The data of this manuscript could be available from the corresponding authors upon reasonable request.

Funding

Not applicable.

Publisher's note

References

1. Cherry JD, Tan T, Wirsing von König CH, Forsyth KD, Thisyakorn U, Greenberg D, et al. Clinical Definitions of Pertussis: Summary of a Global Pertussis Initiative Roundtable Meeting, February 2011. Clin Infect Dis. 2012;54:1756–64. [DOI] [PubMed] [PMC]
2. Pertussis (whooping cough) [Internet]. Centers for Disease Control and Prevention; [cited 2025 Mar 10]. Available from: http://www.cdc.gov/pertussis/surv-reporting.html
3. National Vaccination Program [Internet]. Institute of Public Health; c2017 [cited 2025 Mar 10]. Availabe from: https://www.ishp.gov.al/departamenti-i-kontrollit-te-semundjeve-infektive/programi-kombetar-i-vaksinimit/
4. American Academy of Pediatrics. Pertussis (whooping cough). In: Kimberlin DW, Banerjee R, Barnett ED, Lynfield R, Sawyer MH, editors. Red Book: 2024–2027 Report of the Committee on Infectious Diseases. 33rd ed. American Academy of Pediatrics; 2024. p. 656.