

Is it time to administer the pneumococcal vaccine to healthy unvaccinated children older than 5 years of age?

The conjugated pneumococcal vaccine was approved by the U.S. Food and Drug Administration in 2000. The initial vaccine contained seven pneumococcal serotypes, and in 2024, a 21-valent pneumococcal conjugate vaccine was introduced to the market. Despite significant improvement in the development of an immunogenic and effective vaccine against many invasive and noninvasive forms of pneumococcal disease, few countries have not yet included this vaccine in their National Immunization Program (NIP) primarily due to financial constraints. Iran began to include the 10-valent pneumococcal conjugate vaccine (Pneumosil®) in the Expanded Program on Immunization in 2024. The 13-valent pneumococcal conjugate vaccine (Prevnar® 13) is also available in Iran in private settings.

According to the Prevnar 13, 15, 20, and 21 vaccine schedule, all children under 5 years old should receive the conjugated pneumococcal vaccine. The number of doses needed is determined by the catch-up program based on the age of the individuals at the time of the first vaccine dose and the number of previous doses received. Currently, there is no indication for healthy children without risk factors to receive this vaccine after the age of 5 years. However, once individuals reach the age of 65 years, it is recommended that they receive one dose of the conjugated pneumococcal vaccine. Children aged 6 to 18 years old and adults aged 19 to 64 years old with certain risk conditions are vaccinated according to the available recommendations.^[1]

According to current guidelines, healthy children over the age of five who are unvaccinated and do not have any risk factors are not recommended to receive the vaccine.^[1,2] However, the potential risk of infection caused by this microorganism still poses a threat to children even after they reach five years of age and older.

During the post-COVID-19 era, we have experienced several cases of invasive pneumococcal infections, including complicated pneumonia caused by *Streptococcus pneumoniae* infection, resulting in

morbidity and even mortality. The cultures were negative mainly due to previous antibiotic consumption, and our diagnosis was based on a positive polymerase chain reaction (PCR) test. During this period, many cases of pneumococcal pneumonia were complicated by empyema leading to intensive care unit admission, chest tube insertion, video-assisted thoracic surgery, thoracotomy, sepsis, and even death. Although most patients were under 5 years of age, a significant number of cases were actually over 5 years old. This suggests that even after the recommended age for pneumococcal vaccine administration has passed, healthy children are still at risk of invasive infections and may benefit from vaccination.

According to the most recent vaccine schedule update, children at high risk for the complications of pneumococcal infection must receive the vaccine based on their level of immunosuppression and risk assessment.^[1,2] In addition, children with recurrent otitis media or invasive pneumococcal disease may benefit from vaccination.^[3,4]

Some countries that have been consistently vaccinating their eligible groups with conjugated pneumococcal vaccine for several years may experience herd immunity among the population that has not been vaccinated. However, in countries, where the vaccine has recently been included (e.g., Iran) or has not yet been included in the NIP, nonimmune children over the age of 5 years also remain at risk of contracting the disease.

It is important to note that the potential financial implications of expanding vaccination to older children, which is crucial for policymakers, are a significant issue, especially in countries with financial constraints. In addition to resource allocation, another potential concern regarding the implementation of a new vaccination guideline, is the public health priorities of the countries. A cost-benefit analysis is necessary before making any decision.

A multicenter study is proposed to quantify the incidence of invasive pneumococcal infections in children over 5 years old and collect detailed statistical data. This data will strengthen the argument for vaccination and address potential concerns such as resource allocation and public health priorities. Furthermore, it is advisable to identify the serotypes of pneumococcus isolated from patients over the age of 5 years and assess the burden of the disease in this particular age group. This evaluation should not be limited to Iran; it should also include communities with a long-term history of vaccinating individuals under the age of 5 years.

In conclusion, it may be necessary to establish a new guideline for vaccinating healthy children over the age of 5 years who have not yet received their routine pneumococcal vaccine. This is especially important in communities where the pneumococcal vaccine has recently been introduced or is not included in the NIP for children under the age of 5 years.

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Conflicts of interest

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