

Gathering Medicine: Is Pneumococcal Vaccination Useful to Prevent Pneumonia in Elderly Pilgrims to Mecca?

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Abstract

Introduction: The Hajj pilgrimage in Mecca is an annual mass gathering event with high risk of infectious diseases.

Method: In this short communication we try to check clinical evidence comforting pneumococcal vaccination to prevent pneumonia in elderly pilgrims to Mecca.

Results and discussion: Current medical researches focused on microorganism portage and pathogens responsible of epidemic infectious diseases. In this context, and since the epidemic meningitides declared among Mecca pilgrims in 1987, vaccination procedures were developed. However recommendations for prevention of respiratory tract infection, mostly faired when Influenza H1N1 or Middle East Coronavirus are suspected, are still under health professional expectations.

Conclusion: Since many countries published clinical expert reports, we recommend an international clinical survey to provide evidence based practice of pneumococcal vaccination for elderly pilgrims to Mecca.

Keywords: Vaccination; Infectious diseases; Pilgrims

Every year, around 3 million people attend the Hajj pilgrimage in Mecca, Saudi Arabia, from all over the world. There is an annual mass gathering with the aggregation of people coming from different environments, particularly with high rates of infectious diseases, into small and geographically confined areas. During Hajj, infectious diseases and hot weather conditions associated with heat stroke and dehydration represent the major health problems. Additionally, most pilgrims are elderly and have chronic diseases, which make them more susceptible to health risks associated with pilgrimage. However, the widespread use of air conditioning in the last few years has reduced the risk of heat stroke and dehydration. So, infectious diseases remain the major problem during the pilgrimage with acute respiratory tract infections (ARTI) as the most common cause of attending primary healthcare centers and admission to hospital [1]. The most commonly etiology of ARTI at the Haj is viral. Nevertheless, bacterial superinfection often occurs. More than 200 viruses can cause ARTI but viruses which are most frequently isolated from symptomatic patients during the Hajj are rhinovirus (5.9 - 48.8% prevalence), followed by Influenza virus (4.5-13.9%) and coronaviruses (2.7-13.2%), with most infections due to coronavirus 229E. Other types of viruses are less frequently isolated[2]. To reduce the risk of viral ARTI, the ministry of health in Saudi Arabia recommends the seasonal influenza vaccine for all Hajj pilgrims, particularly for those who are at a higher risk of severe complications. However, despite vaccination, influenza is described among Hajj pilgrims. The mismatch between the vaccine strains choices and circulating strains which are likely to impact Hajj pilgrims is attributed to vaccine failure [3]. This mismatch is due to Hajj advance by 11 days each year. Indeed, Hajj takes place in the last month of the lunar calendar, which is about 11 days shorter than the Gregorian calendar. So, when the Hajj takes place in the summer season of the northern hemisphere, pilgrims will not have an opportunity to be vaccinated before traveling.

The ARTI and particularly pneumonia are also caused by bacterial agents. A recent cohort survey shows that Hajj pilgrimage is associated with a statistically significant increase of nasal acquisition of *S. pneumoniae* [4]. Furthermore, many studies have identified *S. pneumoniae* as a most common cause of community acquired pneumoniae in Gulf States [5]. During Hajj, *S. pneumoniae* is noted very

likely to be an important cause of morbidity and mortality in pilgrims, especially with the presence of the risk factors for pneumococcal disease such as overcrowding, air pollution, old age, and the underlying diseases. It is one of the leading causes of vaccine preventable diseases. Indeed, pneumococcal polysaccharide vaccine 23 (PPV23) and 13-valent pneumococcal conjugate vaccine (PCV13) are recommended for the prevention of pneumococcal disease in different countries. Currently, pneumococcal serotype distribution at Hajj is not known. However, a recent cohort survey identified 52 different serotypes of *S. pneumoniae* in nasal carriage among pilgrims during the 2011 and 2012 Hajj seasons, with the most commonly being serotype 3, 19F and 34 [6] The same study demonstrated that PCV13 serotypes constituted 38% of all pneumococci, 40% of antibiotic non-susceptible pneumococci and 66% of multiple non-susceptible pneumococci. Similar figures for PPV23 were 54%, 53% and 67%, respectively [6]. Although PPV23 covers more serotypes than PCV13 and demonstrated efficiency against invasive pneumococcal disease for adults, it does confer short-lived protection and its efficiency against community acquired pneumonia is uncertain [5,7]. Recent assessments indicate that PCV13 may offer advantages over PPV23. Indeed, many studies have highlighted that pneumococcal conjugate vaccine are more effective than the polysaccharide vaccine in preventing invasive and non-invasive infections for children less than 5 years old and for adults (>65 years old), and for preventing pneumococcal disease in immunocompromised patients of [7]. It may also reduce vaccine-serotype carriage leading to a reduction in disease transmission and confer more prolonged immunity [7]. At present, neither the PPV23 nor PCV13 is recommended locally or nationally

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Received February 25, 2019; **Accepted** March 05, 2019; **Published** March 12, 2019

Citation: Hamouda C, Najja H (2019) Gathering Medicine: Is Pneumococcal Vaccination Useful to Prevent Pneumonia in Elderly Pilgrims to Mecca? *Emergency Med* 9: 391. doi: [10.4172/2165-7548.1000391](https://doi.org/10.4172/2165-7548.1000391)

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for pilgrims. However, the polysaccharide pneumococcal vaccine is strongly recommended for adults older than 65 years. The general vaccination for Hajj pilgrims has been discussed and acknowledged in the literature and adopted by some countries. In terms of evidence based practice, we need more studies before highly recommending pneumococcal vaccination for all pilgrims as a mandatory requirement for Hajj and then which type of vaccine to choose (polysaccharide, conjugate, or both).

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