



Barriers to Uptake Pneumonia Vaccines among Chinese Elderly

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Dear Editor-in-Chief

Streptococcus pneumoniae infection is an important cause of illness and death in the elderly. In China, the incidence of pneumonia among the elderly over 75 yr is 11.6% (1). As the age increases, the probability of pneumonia infection in the elderly increases dramatically (2). The elderly is not only a high-risk group of pneumonia, but also the major group of people who die from pneumonia. According to statistics from the Chinese Center for Disease Control and Prevention, 89% of patients who died of pneumonia are older than 65 years old, and more than 125,000 Chinese elderly people die of pneumonia infection in 2019 (1). Vaccination is the most economical and effective means of preventing disease. Pneumococcal polysaccharide vaccine (PPSV23) has a good protective effect on pneumonia (3). In view of the fact that PPSV23 is well protected against pneumonia-related diseases worldwide, organizations such as WHO and ACIP recommend that older people should be vaccinated with PPSV23. In developed countries, the vaccination rate of pneumonia vaccine for the elderly is as high as 65% (3), while the vaccination rate of pneumonia vaccine for the elderly is less than 1% in China (1). What causes the low vaccination rate?

Awareness about pneumonia vaccination is a determining factor

From January 2018 to December 2021, we launched a survey and the results showed that Chinese elderly have a few knowledge about the role and necessity of vaccination against pneumonia: 12.2% of respondents support that it is necessary to uptake pneumonia vaccine, 9.8% of respondents believe that pneumococcal vaccination can prevent pneumonia, and only 1.3% of respondents know the prevention mechanism of pneumonia vaccine. The elderly in China mainly get knowledge about pneumonia vaccination through the following ways: physician recommendations, introduction by relatives and friends, and learning on the Internet. However, relatives and friends are not medical professionals, and some of their views may not be completely correct; Chinese physicians have a huge workload and rarely have time to conduct health education for their patients. These unfavorable reasons prevented Chinese elderly from getting enough and correct knowledge about pneumonia vaccination.

Expenditure of pneumonia vaccination act as an important but not decisive factor

The current survey shows that 76.2% of re-



spondents think the cost of pneumonia vaccination is high. The charge of PPSV23 vaccination is \$33, while the average treatment cost of elderly pneumonia is \$2115. From the perspective of cost-benefit, there is no reason to refuse pneumonia vaccination. Interestingly, even in free vaccinated areas, e.g. Beijing, Shanghai, Nanjing, the vaccination willingness of Chinese elderly was remained low. In 2013, Shanghai launched a free pneumonia vaccination program for the 60+ years old people, and it is the earliest free pneumonia vaccination program in China. The elderly people who uptake the pneumonia vaccine reached 1.6 million, accounting for 31.6% of the elderly population, while it is less than half of vaccination rate in developed countries (1).

Psychological perception is an influential variable

Among the current survey samples, 1358 elderly people are unwilling to uptake pneumonia vaccines. Their reasons were as follows: 733 (54%) respondents are concerned about possible adverse reactions to pneumonia vaccination, 460 (34%) respondents feel that it is unnecessary to be vaccinated as he/she is in good health, and 165 (12%) respondents feel that the vaccination is not effective to deal with pneumonia. Older people with chronic respiratory diseases are significantly more concerned with preventing respiratory diseases ($P < 0.05$), so their willingness to vaccinate against pneumonia is stronger.

Demographic variables have significant impacts on pneumonia vaccination willingness

The youngest group (60-65) is more likely to be vaccinated than other age groups ($P < 0.05$). In regions where residents pay for the pneumonia vaccination, the income and education level of the elderly do not significantly affect their willingness. Among the samples collected in the free pneumonia vaccination areas, respondents with low income were more likely to receive vaccina-

tion than those with higher income ($P < 0.05$), and those with lower education levels had higher vaccination intentions ($P < 0.05$).

For the Chinese government, the implementation of pneumonia vaccination is an inevitable option for the upcoming large-scale aging population. Health education for the elderly is a necessary measure to improve their knowledge of pneumococcal-related diseases and pneumonia vaccines. As older people have different psychological perceptions for pneumonia vaccination and demographic characteristics, it is necessary to develop the targeted incentive measures, rather than implement a same policy in different areas of China.

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Conflict of interests

The authors declare that there is no conflict of interests.

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