SHORT COMMUNICATION

Pneumococcal vaccination in community homes for the elderly: a Maltese perspective

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ABSTRACT

Background

Pneumonia is a leading cause of morbidity and mortality worldwide. Vulnerable individuals, such as the geriatric population, are at an increased risk. *Streptococcus pneumoniae* is the most common cause of bacterial pneumonia. Pneumococcal vaccines offer protection against both invasive disease and pneumonia caused by this pathogen. The Centers for Disease Control and Prevention recommends that all adults over the age of 65 years should be vaccinated.

Objective

To gather local data from a community home in Malta about the percentage of residents aged ≥65 years vaccinated against *Streptococcus pneumoniae*.

Method

Questionnaires were distributed to residents at Mtarfa home (and/or relatives in cases of cognitive impairment) to determine whether they were ever recommended the vaccine and whether they took it.

Results

Out of a total of 65 completed questionnaires, only 12.3% had heard about the vaccine and only 7.7% took it. All vaccinated residents were female, and all had a chronic lung pathology.

Conclusion

Pneumococcal vaccine awareness and uptake were very low. This is probably multifactorial. Doctors should be made aware of the different formulations of pneumococcal vaccines available and promote their use when warranted. In October 2024, the national immunization program expanded pneumococcal vaccination to include the elderly. Adults aged 65+ are now eligible to receive the 20-valent conjugate vaccine (PCV20), as opposed to the 10-valent vaccine (PCV10) used for routine immunisation in infants.

Key words

Elderly population, pneumococcal vaccine, pneumonia, *Streptococcus pneumoniae,* vaccine.

INTRODUCTION

Background

Pneumonia is a common cause of morbidity and mortality, especially in the geriatric population. Six percent of all treatable causes of mortality in the European Union are due to pneumonia (OECD and European Union, 2022). The majority of bacterial pneumoniae are caused by *Streptococcus pneumoniae* (Dion and Ashurst, 2023). This pathogen can cause local infections such as pneumonia, sinusitis and otitis media. More virulent strains can cause invasive infections including bacteraemia, bacteraemic

pneumonia, meningitis and osteomyelitis. Such invasive infections carry a higher mortality rate.

Thirty-one confirmed cases of invasive pneumococcal disease (IPD) were registered in Malta during 2018 (European Centre for Disease Prevention and Control, 2020). This corresponds to a rate of 6.5 cases per 100 000 population. This rate is not evenly distributed among the general population. The major impact of this disease is among the paediatric and geriatric populations, with males being more susceptible than females. Clinical risk groups include individuals with various chronic conditions including cardiovascular, neurological, respiratory, hepatobiliary, diabetes, chronic kidney disease (stages 4 and 5) and immunosuppression (due to disease or treatment) (Djennad et al., 2018). Other risk factors include previous pneumonia.

Pneumococcal vaccines protect against both local and invasive infections caused by the more common serotypes of this pathogen. The CDC (Centers for Disease Control and Prevention) recommends pneumococcal vaccination for all adults aged 65 years or older. Most European states also have national recommendations for pneumococcal vaccination in this age group. Pneumococcal vaccination uptake in the USA reaches approximately sixty-three percent, with uptake being much higher than in Europe where between twenty to thirty percent of the elderly population is vaccinated (Patterson et al., 2016). A previous article published in this journal sheds light on whether geriatricians and general practitioners in Malta recommend the pneumococcal vaccine to their patients. Ninety-four percent of doctors (out of forty-seven responses) claimed that they do so and seventy-nine percent of these doctors were familiar with the pneumococcal vaccine guidelines (Zerafa et al., 2020).

This study investigates the uptake of pneumococcal vaccine in a community elderly home prior to the introduction of this vaccine for elderly people in a national immunisation programme.

Objective

The aim of this study is to determine the percentage of elderly residents at Mtarfa home who were recommended the vaccine, and the percentage of those residents who took the vaccine.

METHOD

Permission to perform this study was obtained from the Chief Executive Officer of Active Ageing and Community Care (AACC) and from the Data Protection Officer of AACC. All data was processed anonymously, and data was deleted when it was no longer required. Approval from a Health Research Ethics Committee was not deemed necessary.

Sixty-eight residents from Mtarfa home were included in this study. Residents under sixty-five years of age were excluded. Questionnaires were handed out in person to residents. In the case of residents with cognitive impairment these were given to their relatives during visiting hours. These questionnaires included the residents' demographics and a description about the pneumococcal vaccine. Two questions with both yes/no answers needed to be completed. The first question was whether the pneumococcal vaccine was ever recommended to them, and the second question was whether they ever took the vaccine. Residents' past medical history was then recorded, focusing on chronic lung diseases. The percentages of residents who had been recommended the vaccine and those who took the vaccine were calculated.

RESULTS

Sixty-eight questionnaires were completed between 7th and 19th February 2024. Three residents were excluded since they were younger than sixty-five years old, leaving sixty-five eligible questionnaires – forty-nine females and sixteen males, as seen in Table 1. Seven out of forty-nine (14.3%) females and one out of sixteen males (6.3%) had the vaccine recommended to them. Thus, in total, eight out of sixty-five (12.3%) residents had the vaccine recommended to them, as seen in Table 2.

Table 1: Total number of residents, and gender distribution.

Gender	Number of residents	Percentage
Male	16	24.6%
Female	49	75.4%
Total	65	100%

Table 2: Total number of residents who had the vaccine recommended to them.

Vaccine recommended to resident	Number of residents	Percentage
Yes	8	12.3%
No	57	87.7%

Only five out of sixty-five residents were vaccinated (7.7%) (Table 3). All vaccinated residents were female. Out of these five residents two of them had a diagnosis of chronic obstructive pulmonary disease, two of them had a diagnosis of asthma and one with bronchiectasis.

Table 3: Total number of residents who took the vaccine

Resident was vaccinated	Number of residents	Percentage
Yes	5	7.7%
No	60	92.3%

DISCUSSION

This study sheds light on the awareness of the pneumococcal vaccine amongst both health care professionals as well as elderly residents living in a long term care community.

Streptococcus pneumoniae (pneumococcus) is a gram-positive bacterium which commonly inhabits the nasopharynx of humans. It is a human pathogen, there are no other animal or insect vectors. Transmission from one infected person to another person occurs via aerosol, respiratory droplets or by direct contact with secretions (Weiser, Ferreira and Paton, 2018). As with many other respiratory pathogens, pneumococcal infections are more common in the winter months. The virulence of this pathogen is mainly determined by the presence of a polysaccharide capsular structure, which surrounds the cell wall. By 2020, one hundred different capsulated serotypes were identified (Scelfo et al., 2021). Various pneumococcal vaccines were developed based on those serotypes of common occurrence.

The results of our study show that only 12.3% of residents in Mtarfa home had the pneumococcal vaccine recommended to them, and only 7.7% actually took the vaccine. Awareness about influenza and covid-19 vaccines is good and the majority of residents are offered these vaccines annually. In contrast to findings in a previous article (Zerafa et. al., 2020), this study highlights the fact that pneumococcal vaccine awareness in the local geriatric population is low, with only a minority of doctors having recommended this vaccine.

Four pneumococcal vaccine formulations are available locally: PPSV 23, PCV 10, PCV 13 and PCV 20 (although PCV 13 will eventually be replaced by the PCV 20). The 23-valent polysaccharide vaccine (PPSV23, Pneumovax 23®) was licensed first in the United States in 1983. PPSV 23 is still available on the government formulary for hospital use. PPSV23 is not licensed for use in infants. The first pneumococcal conjugate vaccine (Prevenar 7®, PCV7) was licensed for

use also in the United States in 2000. It included purified capsular polysaccharide of seven serotypes of *Streptococcus pneumoniae*. In 2010, a 13-valent pneumococcal conjugate vaccine (PCV13, Prevnar 13®) was licensed and replaced the 7-valent vaccine. The PCV13 was recently replaced with PCV20 on the inpatient government formulary; it is restricted for use in paediatric patients (requiring consultant paediatrician endorsement), pre or post-splenectomy patients and in patients following bone marrow or stem cell transplants. The 10-valent pneumococcal conjugate vaccine (PCV10, Synflorix®) was first licensed in 2009. It was introduced in the national immunisation programme for infants in May 2020.

A recommendation by the local Advisory Committee on Immunisation Practice (ACIP) for the introduction of the 20-valent pneumococcal conjugate vaccine (PCV20, Prevenar 20® previously branded as Apexxnar®) for people sixty-five years and older has been implemented under the national immunisation programme, coinciding with the seasonal flu vaccination campaign. This study emphasises the need for health care providers to promote this vaccine which is now available for the geriatric community. It is the duty of all healthcare professionals to be familiar with the pneumococcal vaccine recommendations and promote this vaccine when warranted. They should clearly explain to patients the effectiveness and safety of this vaccine, clearing any misconceptions and highlighting aspects such as that this is a non-live vaccine, the vaccine does not contain any preservatives and that pneumococcal vaccines have been around for more than twenty years.

Studies regarding the effectiveness and duration of immunity of the PCV13 compared with the PPSV 23, show that the former is superior. The PCV 13 showed no decline in immunity after 5 years, in individuals aged ≥65 years old. The PPSV 23 showed waning antibody titres as early as 2 years post vaccination. The PCV 13 showed a 75% effectiveness at preventing IPD and a 45% effectiveness against non-invasive pneumococcal pneumonia. The PPSV 23 showed 45% effectiveness against IPD, and 18% against non-invasive pneumococcal pneumonia (Djennad et al., 2018).

Relying on patients and relatives' knowledge about vaccination history is not entirely accurate. Some residents might have taken the vaccine without recollection of taking it. On the other hand, some residents may have not taken the vaccine and mistakenly thought that they did. This limitation could have been avoided with proper documentation, including an electronic database accessible to all doctors, to verify the vaccination history of their patients. This study only included residents at Mtarfa home. More research is needed to gather data about vaccination uptake in other community homes, and to compare this with people living in their own homes.

Despite the above limitations, it is still clear from this study that only a small percentage of the involved elderly population were informed about the vaccine and an even smaller population took it. Keeping in mind the findings of this study, more education is necessary regarding vaccination options. A vaccination history should be part of a comprehensive geriatric assessment and should be clearly documented. Increasing vaccination rates is a powerful tool at the disposal of health care professionals to improve overall public health within a community.

CONCLUSION

Only a very small percentage of residents living in Mtarfa home were vaccinated with the pneumococcal vaccine. This is understandable given the lack of awareness, as only 12.3% of residents had the vaccine recommended to them.

In October 2024, the national immunisation programme extended the programme for pneumococcal vaccination to the elderly population. This follows the introduction of such vaccination for infants in May 2020. The formulation available for 65+ age group is the 20 valent conjugated vaccine (PCV20) as opposed

to the 10-valent vaccine (PCV10) for routine immunisation in infants.

Increasing awareness, combined with the inclusion of the pneumococcal vaccine for the geriatric population within the national immunisation programme, will ensure that this vaccine is more readily accessible to our geriatric population.

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