RESEARCH ARTICLE

Is a pneumococcal vaccine for the elderly appropriately recommended by Maltese geriatricians and general practitioners?

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ABSTRACT

Background and objectives

The Centre for Disease Control and Prevention, the World Health Organization, and the National Institute for Health Care and Excellence recommend the pneumococcal vaccine to patients aged 65 years and over, patients with chronic lung disease and patients suffering from a number of other listed chronic conditions. This study aimed to assess whether geriatricians and family practitioners in Malta recommend the pneumococcal vaccine to the above mentioned populations.

Method

A questionnaire was formulated by the authors to collect demographic data about the respondents, inquire whether respondents knew about the pneumococcal vaccine, its availability in Malta, its properties, which groups of patients are recommended for administration of this vaccine, and whether these patients were being identified in the respondents' practice. The questionnaire was circulated via electronic email to family practitioners and geriatricians in Malta. All responses were then compiled, and the results formulated and analysed.

Results

A total of 47 responses were collected: 28 were family practitioners (60%) and 19 were geriatricians (40%). Forty-four (94%) respondents recommend vaccines in their daily routine, but only 37 (79%) of respondents are aware of the guidelines on the pneumococcal vaccine. Ten (23%) respondents always include the vaccine as part of their management of pneumonia, 25 (54%) occasionally do so and 10 (19%) never do. Twenty-six (55%) respondents recommend the vaccine in patients aged 65 years and over, 44 (93%) recommend it in chronic lung disease, 23 (48%) recommend it in post-splenectomy patients, 29 (62%) in immunocompromised patients and 32 (67%) in congestive heart failure.

Conclusion

There is a need for geriatricians and family practitioners in Malta to be reminded of the guidelines surrounding the pneumococcal vaccine and in which groups of patients it should be recommended.

Key Words

Pneumococcal vaccines; aged; geriatricians; general practitioners; Malta.

INTRODUCTION

The pneumococcal vaccines

The pneumococcal vaccines (PCVs) are inactivated or 'killed' vaccines that do not contain live organisms. As explained by the Centre for Disease Control and Prevention (CDC), such vaccines help prevent pneumococcal disease, which is any type of infection caused by *Streptococcus pneumoniae* bacteria (pneumococcus) (CDC, 2018a).

The World Health Organisation (WHO) mentions that this bacterium can cause a spectrum of disease including otitis media, upper respiratory tract infection (URTI) as well as more serious infections such as pneumonia, meningitis and bacteraemia (WHO, 2017; Daniels, Rogers and Shelton, 2016). It is a leading cause of illness in young children, and of death in elderly people and people with immune deficiencies and chronic illness (Jefferson and Demicheli, 2002). It is spread from person to person by direct contact with respiratory secretions like saliva and mucus (Daniels, Rogers and Shelton, 2016; CDC, 2018b).

Two types of pneumococcal vaccines are available. The pneumococcal conjugate vaccine (PCV 13 or Prevnar 13) protects against 13 strains of pneumococcal bacterium. It is recommended for all children younger than 2 years old, all adults who are 65 years or older, and those from 2 to 64 years old with particular medical conditions (see next section). The pneumococcal polysaccharide vaccine (PPSV23 or Pneumovax 23) protects against 23 strains of pneumococcal bacterium (CDC, 2019a). It is recommended for all adults who are 65 years old or over, those from 2 years old to 64 years old with certain medical conditions, and adults 19-64 years old who smoke cigarettes.

Who and how to vaccinate?

The CDC compiled a list of medical conditions and recommends that any patient suffering from any one or more of these conditions gets vaccinated against pneumococcal bacteria. These include alcoholism, chronic heart disease, chronic liver disease, chronic lung disease (including chronic obstruction pulmonary disease (COPD) and asthma), diabetes mellitus, any immune compromising conditions, nephrotic syndrome, human immunodeficiency virus (HIV) infection, sickle cell disease, malignancy, and congenital or acquired asplenia. Smokers are also listed among those at increased risk for pneumococcal disease, and therefore it is recommended they take the pneumococcal vaccine too (CDC, 2019b).

The recommended method for administration according to the CDC is as follows: a dose of PCV13 should be given to adults 65 years or older (if they have not received a dose before) and then a dose of PPSV23 is administered at least 1 year later. In patients who have already received PPSV23, a dose of PCV13 should be given at least 1 year after the most recent dose of PPSV23 (CDC, 2019b).

Additionally, the National Institute for Health Care and Excellence (NICE), along with Public Health England, have updated their local guidelines on the vaccination of children to include the PCV13 as part of the national immunisation schedule (NICE, 2019).

Campaigning and raising awareness of the vaccine by physicians

It has also been demonstrated that an effective campaign in a general practice setting is an effective way for increasing the uptake of pneumococcal vaccine (McDonald, et al., 1997).

This also applies to paediatricians and geriatricians. Two particular studies which focus on the paediatric population in Jordan and Singapore have concluded that strengthened efforts by health care providers, which include prioritizing distribution of key messages on PCV, its benefits and side-effects, can motivate parents and encourage the uptake of the PCV amongst their children (How, et al. 2016; Masadeh, et al. 2014).

The availability of the pneumococcal vaccine in Malta

Currently, there are 2 brands of conjugate pneumococcal vaccine on the Maltese market – Synflorix and Prevnar-13. These vaccines can be given to children from the age of 6 weeks, with a second dose at 4 months and a booster dose during the second year of life. The 10-valent vaccine (Synflorix) was introduced on the National Immunisation Schedule in May 2020 (Primary Child & Youth Health & Immunisation Unit, 2020).

Aim

This study aimed to evaluate and demonstrate in a descriptive way whether family practitioners and geriatricians in Malta are aware of the pneumococcal vaccine, its properties, and in which populations it is recommended.

METHOD

The CDC, NICE and WHO guidelines on the pneumococcal vaccine were researched. A literature review on the pneumococcal vaccine and its use among elderly populations and the community was also conducted.

A questionnaire was formulated by the authors using the Google Forms software. Its purpose was to collect data on whether family practitioners and geriatricians are aware of and are following the guidelines researched. It included a total of 29 questions divided into two sections. The first section requested demographic data such as age, gender, speciality, years in practice, public or private sector of medical practice, and region of Malta where practice is held. The second section comprised of 23 questions all relating to the properties of the vaccine, the guidelines surrounding its use, whether respondents included vaccination in their daily practice, and whether respondents were aware of the pneumococcal vaccines available in Malta. Finally, respondents were asked for their feedback on why uptake of this vaccine may be hindered in Malta, and what improvements could be made if any.

Ethics committee permission was not required as no human subjects were involved in the research. However permission was sought from the Head of the Geriatrics Department at Karin Grech Hospital, the Secretary General of the Geriatric Medicine Society of Malta, the Principal General Practitioners of the public Primary HealthCare service of the three regions in Malta, and the Secretary Generals of the Malta College of Family Doctors and the Association of Private Family Doctors for circulation of a special link to the survey software via electronic mail (Microsoft Outlook) to all family practitioners and geriatricians working or affiliated with these entities. Prior to its distribution a pilot questionnaire was circulated for a preliminary test.

The link was distributed through electronic mail a total of five times to all of these entities until a substantial number of responses were collected. Once a suitable number had been reached, the responses were analysed in a descriptive fashion.

RESULTS

As this study intended for Family Practitioners and Geriatricians working in Malta was circulated to a these specialists with the purpose of recording data from a variety of practices (public or private), regions in Malta, years in practice etc., this enabled the data to be more representative of the practices of respondents from all over Malta, at all stages of training, and in public and private sectors of health.

A total of 47 responses were collected. Table 1 demonstrates the demographic data collected from the respondents.

Table 1: Table showing distribution of demographic data from respondents in numerical and percentage form

	Number of responses	Percentage of total responses (%)
Family Practitioners	28	60
Geriatricians	19	40
Female	20	42.6
Male	27	57.4
Aged 20-30 years	11	23.4
Aged 31-40 years	7	14.9
Aged 41-50 years	10	21.3
Aged 51-60 years	18	38.3
Aged 61-70 years	1	2.1
Less than 10 years in practice	15	31.9
10-20 years in practice	6	12.8
20-30 years in practice	18	38.3
More than 30 years in practice	8	17
Work in the public sector only	30	63.8
Work in the private sector only	9	19.1
Work in both private and public sectors	8	17
Work in central region of Malta	18	38.3
Work in north region of Malta	1	2.1
Work in south region of Malta	17	36.2
Work in two regions of Malta	2	4.1
Work in all regions of Malta	7	14.9
Work in other regions of Malta not mentioned above	2	4.1

Table 2 demonstrates the data collected pertaining to whether the respondents include the pneumococcal vaccine in their practice, both in general daily practice and in the treatment of diagnosed pneumonia disease.

Table 2: Table showing data collected regarding the inclusion of the pneumococcal vaccination in the respondents' medical practice

	Number of responses	Percentage of total responses (%)
Aware of the CDC and NICE guidelines on pneumococcal vaccination	37	78.7
Actively encourage vaccination in practice	44	93.6
Keep vaccination records in their practice (family practitioners)	17	36.2
Keep vaccination records in their practice (geriatricians)	8	17.0
When pneumonia diagnosed, enquire on pneumococcal vaccination status - always	8	17.0
When pneumonia diagnosed, enquire on pneumococcal vaccination status - sometimes	23	48.9
When pneumonia diagnosed, enquire on pneumococcal vaccination status- rarely	7	14.9
When pneumonia diagnosed, enquire on pneumococcal vaccination status - never	9	19.1
Actively recommend patients over 65 years of age to take the pneumococcal vaccine	26	55.3

Include pneumococcal vaccine in management of pneumonia in 65-year-olds or older patients - always	11	23.4
Include pneumococcal vaccine in management of pneumonia in 65-year-olds or older patients - sometimes	23	48.9
Include pneumococcal vaccine in management of pneumonia in 65-year-olds or older patients – rarely	9	19.1
Include pneumococcal vaccine in management of pneumonia in 65-year-olds or older patients - never	4	8.5
Recommend the pneumococcal vaccine to patients with specifically listed medical conditions listed in the guidelines - always	22	46.8
Recommend the pneumococcal vaccine to patients with specifically listed medical conditions listed in the guidelines - sometimes	17	36.2
Recommend the pneumococcal vaccine to patients with specifically listed medical conditions listed in the guidelines - rarely	3	6.4
Recommend the pneumococcal vaccine to patients with specifically listed medical conditions listed in the guidelines - never	5	10.6

Respondents were asked whether they were aware of certain properties about the vaccines in Malta – which types are available, how much they cost and where they may be acquired. The results are shown in Table 3.

Table 3: Results of respondents' answers about the pneumococcal vaccines available in Malta

	Number of responses	Percentage of total responses (%)
Aware of where patients may acquire the pneumococcal vaccine in Malta	29	61.7
Aware of how much the vaccine costs in Malta	33	70.2
Aware of the two types of vaccine available in Malta	35	74.5

Furthermore, respondents were questioned about their knowledge on the various properties of the pneumococcal vaccine, such as number of doses, contraindications and target organisms (among other properties). The results of the answers to these questions are shown in Figure 1.

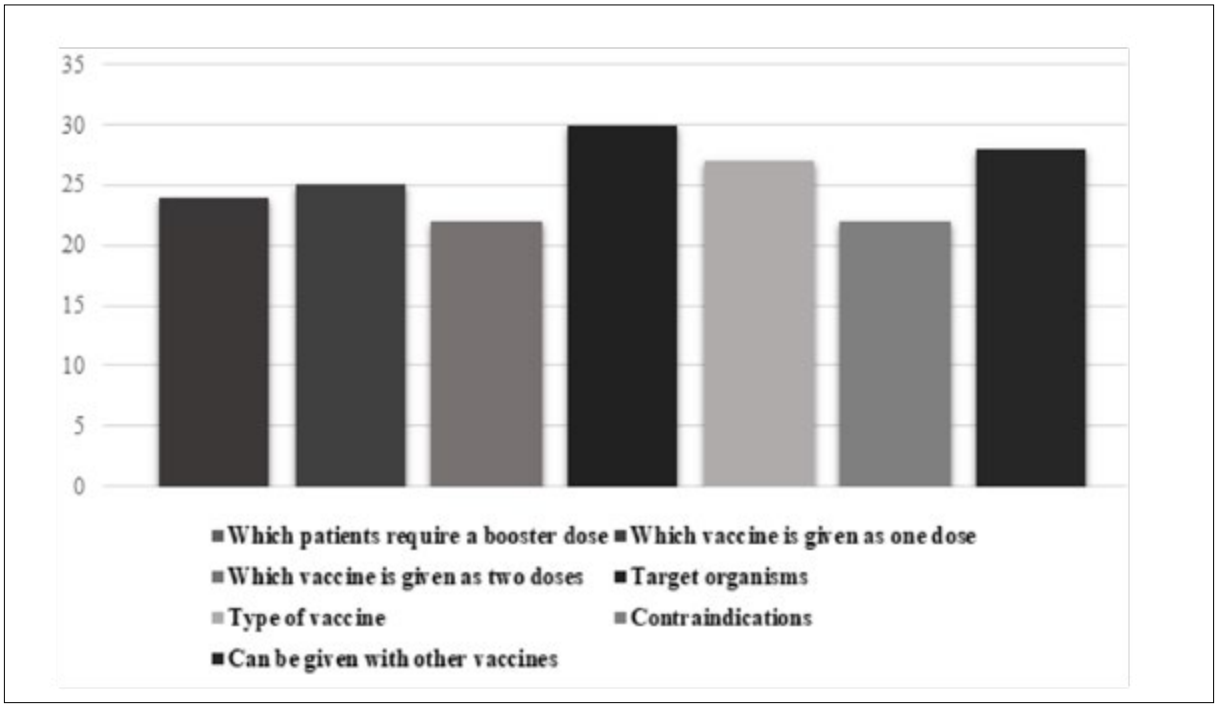

Figure 1: Respondents' answers to questions about the pneumococcal vaccine's properties

The guidelines researched list a number of chronic medical and immunosuppressive conditions; patients suffering from these conditions, without an episode of pneumococcal infection, are to be prescribed the pneumococcal vaccine. Respondents were asked if they were aware that patients suffering from these conditions were recommended to take the pneumococcal vaccine, and whether they had ever prescribed the vaccine to patients suffering from these conditions. The results are shown in Table 4.

Table 4: Table demonstrating how many respondents were aware that medical conditions listed were recommended to take the vaccine, and how many respondents have prescribed the vaccine to these patients.

Medical condition	Number of respondents who knew this condition merited prescription of the pneumococcal vaccine	Percentage (%)	Number of respondents who have prescribed the pneumococcal vaccine to patients suffering from this condition	Percentage (%)
Post-splenectomy	38	86.4	20	47.6
Diabetics	33	75.0	26	61.9
Immunocompromised patients prior/during/ post-treatment	34	72.3	26	61.9
Chronic liver disease and alcoholism	31	70.5	13	31.0
Congestive heart failure	38	86.4	28	66.7
Chronic renal disease	34	77.3	18	42.9
Chronic lung disease	43	97.7	39	92.9

Respondents were then questioned on whether they have noted that vaccination has been effective in their practice, whether they wish for the pneumococcal vaccine to be included in the National Health Service (NHS), and whether they are likely to recommend the vaccine in future after completing this questionnaire, as well as other questions pertaining to their practice. The results are shown in Table 5.

Table 5: Table showing results of respondents pertaining to the pneumococcal vaccine in their current and future practice

	Number of respondents out of 47	Percentage (%)
Noted that patients who get vaccinated suffer less from preventable disease	31	66.7
Noted that patients who took the pneumococcal vaccine suffered less from pneumonia thereafter	20	42.2
Feel that the pneumococcal vaccine should be offered on the NHS to those patients in whom it is recommended	45	95.7
After going through the questionnaire are more likely to recommend the pneumococcal vaccine in future practice	45	95.7

Finally, respondents were asked for their feedback on what may be obstacles in Malta to patients receiving the pneumococcal vaccine. The results are shown in Figure 2.

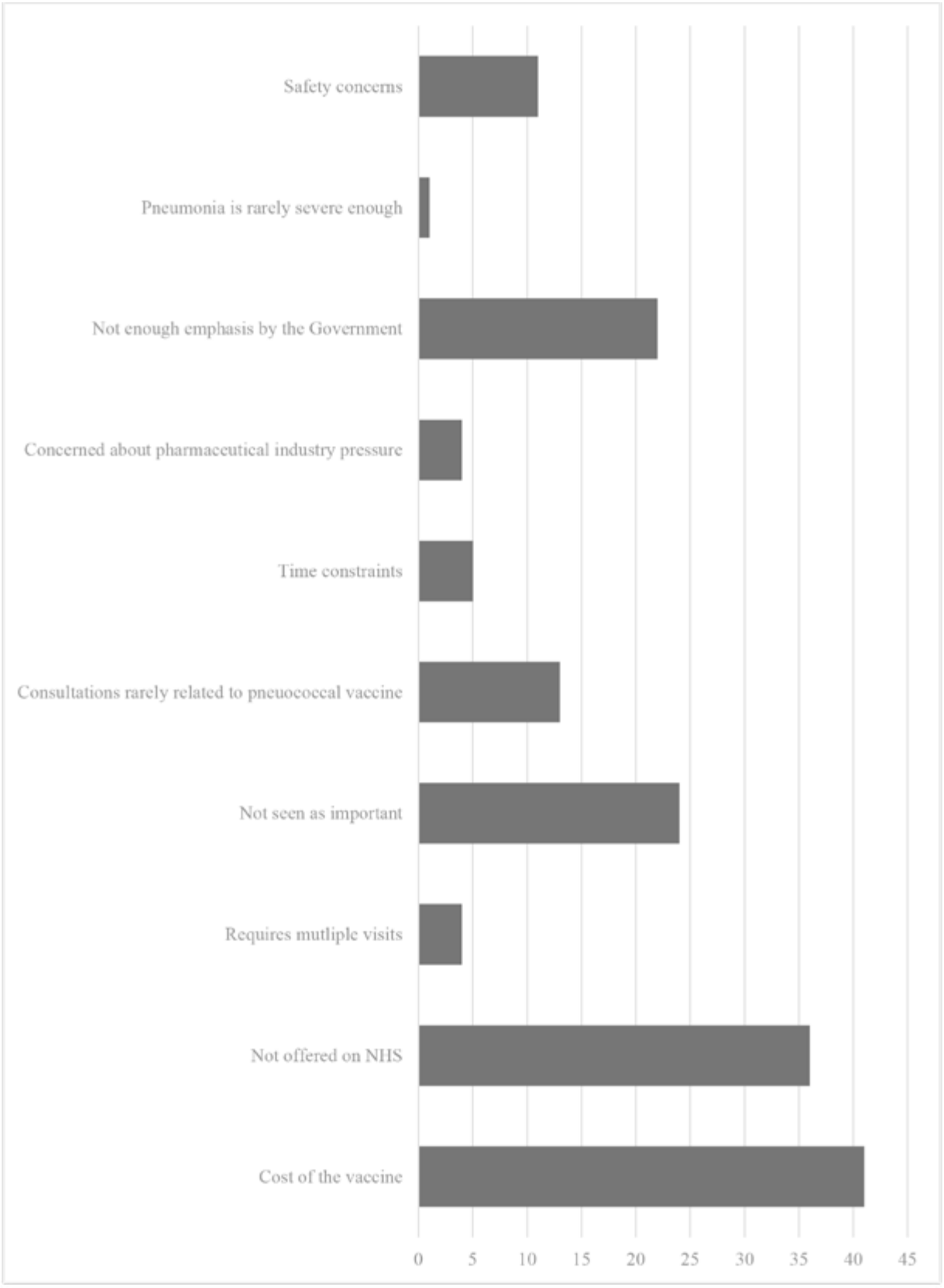

Figure 2: Reasons given by respondents to what barriers may exist in Malta to prevent patients accessing the pneumococcal vaccine

DISCUSSION

During analysis of the results, it was noted that a higher number of respondents were family practitioners (28) rather than geriatricians (19). Therefore the results may be more representative of what goes on in the family practice and primary care sector than in the practice of geriatrics in Malta. Moreover, the data in Table 1 demonstrates that the respondents worked mainly in the public sector rather than private sector, and that the majority had been practicing medicine for more than 10 years. This means that the information gathered is representative of the situation in a number of public health care services and of medical practitioners who have been working in the health care system for more than 10 years.

It is encouraging to note that the majority of respondents actively promote vaccination throughout their practice, and that they are aware of the guidelines surrounding the pneumococcal vaccine. However, as the results in Table 2 demonstrate, few respondents kept records of vaccination in their practice. When diagnosing pneumonia, while it was noted that 23.4% of respondents always inquire on the pneumococcal vaccination status of a patient, and 44.8% sometimes do so, the others admit that they rarely or never do so. Interestingly the respondents who answered in the affirmative to always checking the pneumococcal vaccination status tended to be geriatricians. This may be because geriatricians are trained to deal with patients who have a number of chronic conditions simultaneously, and also because there exist a number of obstacles when primary care physicians treat elderly patients, such as administration issues or medical complexity in treating multimorbid patients (Adams, et. al, 2002; Kane, 2002). Finally, Table 2 also shows how more often than not respondents did not include the pneumococcal vaccine as part of their long-term management of pneumonia. The reasons for this could be several, especially when concerning the public service of primary care in Malta. There was no established electronic record system of patients available in all primary care centres when the study took place, patients often do not meet the same doctor when attending follow-up appointments in the health centres, and time constraints are also a factor. Unfortunately, it has been demonstrated that primary care physicians failing to promote the pneumococcal vaccine is a cause of future preventable pneumonia (Kyaw, Nguyen-Van-Tam and Pearson, 1999).

Table 3 and Figure 1 detail the respondents' answers to questions about details of the vaccine's availability in Malta and on more of its properties as detailed by its developers. The majority of respondents knew about the cost and availability of the vaccine in the Maltese market, but it was noted that there was a lack in knowledge on some of the other properties of the vaccine, particularly which vaccine is given as two doses, and the vaccine's contraindications. This highlights how consistent revision of knowledge about these vaccines' properties is essential in promoting uptake.

With regard to recommending the vaccine outside the management of pneumonia and rather in the management of long-term chronic disease, Tables 2 and 4 demonstrate that less than half of respondents (46.8%) always include this vaccine in their management. When asked if they have prescribed the vaccine in the past to patients with some of these conditions, Table 4 shows that the majority of the respondents have included it in management of chronic lung disease. Despite this the results were less so for other chronic conditions, the lowest for chronic liver disease. One may note however that some of the literature points to more demonstrations of the efficacy of the vaccine in preventing pneumonia in patients with chronic lung disease rather than in patients with other chronic conditions, including multimorbidity. Therefore while the guidelines should be kept in mind in future practice, the research currently being carried out into demonstrating the efficacy of the pneumococcal vaccine in other populations apart from chronic lung disease needs to be closely monitored (Jackson, L.A., et al. 2003; Simberkoff, M.S., et al. 1986; Sims, R.V., et al. 1988).

Finally, Table 5 and Figure 2 include data about how respondents feel the uptake of the vaccine could be improved in Malta. After completing this questionnaire respondents

reported that they are more likely to include the vaccine in their future practice, as shown in Table 5. The same table also shows how respondents would prefer to have the vaccine offered on the NHS in Malta, as the fact that it requires to be purchased is seen as a barrier to promoting its uptake. However the authors note that this study was carried out prior to May 2020 when the pneumococcal vaccine was introduced onto the Maltese National Immunisation Schedule. Figure 2 also demonstrates that another obstacle to promotion of the pneumococcal vaccine is a feeling that 'it is not important'. The fact that the literature currently does not seem to prove the efficacy of the vaccine in a number of more recent studies can be a contributor to this (Conaty, et al. 2004; Kraicer-Melamed, O'Donnell and Quach, 2016; Ochoa-Gondar, et al. 2008). Therefore, further studies need to be carried out both locally and abroad on the vaccine's efficacy for a more informed decision.

This study provides a basic idea of the awareness among family practitioners and geriatricians on the guidelines and promotion of the pneumococcal vaccine, but the study has its limitations and weaknesses. These include:

1. The total number of respondents in this study was only 47. The questionnaire formulated to gather the information was an electronic version and was circulated using digital forums and electronic mailing systems. It was therefore subject to the participants dedicating the time to complete the questionnaire. The results would have been more representative had the number of respondents been greater.
2. The responses collected might not be accurate. In such surveys / studies one has to consider the possibility of respondents providing responses that are considered desirable for the named study.
3. The questionnaire which was formulated included both open-ended and closed questions and therefore it provides a level of detailed and valuable information. The questionnaire manages to cover the most-wanted information.
4. A response rate cannot be calculated, as the exact number of family practitioners and geriatricians to whom this questionnaire was sent is unknown. This was because the link to the questionnaire was initially sent to the Head of the Geriatrics Department, the Principal General Practitioners of the public Primary HealthCare service of the three regions in Malta, and the Secretary Generals of the Malta College of Family Doctors and the Association of Private Family Doctors for circulation, who themselves circulated the questionnaire to the physicians concerned. The authors were only aware of the responses which were completed.

This study suggests that there are gaps in the information and education about the pneumococcal vaccine in Malta among the family practitioners and geriatricians in Malta. Moreover, the results demonstrated that a significant number of the candidates fail to promote the uptake of the vaccine in their daily practice. The reasons for this are various and have been discussed, and ultimately more research into the efficacy of this vaccine in preventing disease is required to shape future practice, particularly in patients with other chronic diseases other than chronic lung disease. Until then the guidelines continue to recommend that the vaccine be promoted in the mentioned patients, and to improve the uptake of this vaccine in Malta, the researchers have compiled a list of recommendations. These are detailed in the Recommendations section.

This study is, as far as the authors are aware, the first study to be carried out locally to demonstrate the awareness among family practitioners and geriatricians on the guidelines about the pneumococcal vaccine. While the aim to have an idea of the situation of local family practices and geriatrics departments has been met, this study highlights the need for more education on this vaccine and all of its properties, including the guidelines to which patients it ought to be recommended.

RECOMMENDATIONS

Following this study, the following recommendations are being put forward:

1. A series of newsletters and reminders (electronic or otherwise) would serve to promote the recommendation of the pneumococcal vaccine to those for whom it is recommended according to the guidelines. These should be targeted towards all medical staff, but family practitioners and geriatricians are in primary positions to promote uptake of this vaccine.
2. Organised workshops should be held for medical professionals to remind them about the properties of the vaccine, including how it is to be administered and other relevant information. There is no need for these to be lengthy or time-consuming. Quick and frequent reminders may be enough to increase this vaccine's uptake.
3. Moreover, it is recommended that the information mentioned in the previous recommendation should be made available to patients using methods and language easy for them to comprehend so that they too may approach their doctors to ask about the vaccine.
4. Finally, a repeat of this study should be carried out after these recommendations have been put forward to study their effect on the vaccine's uptake. This is with particular reference to an adult and geriatric population now that the vaccine is included in the national immunisation schedule for children in Malta as of May 2020.

CONCLUSION

The results of this study demonstrate that a number of doctors from the family medicine and geriatric medicine specialities in Malta fail to include the pneumococcal vaccine in their daily practice, for a number of reasons discussed. Despite this, the majority demonstrated that, after being made aware of it through this questionnaire, they were more likely to include it in their management in the future. The researchers therefore feel that by increasing education and awareness of this vaccine in the Maltese medical community the local uptake of the pneumococcal vaccine will increase significantly.

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