

Utilization of Pneumococcal Vaccine in a Family Practice Residency

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Pneumococcal diseases continue to account for a significant amount of morbidity and mortality in family practice. Daily chart audits revealed significant underutilization of pneumococcal vaccine in a family practice residency. Identified primary factors for pneumococcal vaccine underutilization were inadequate physician knowledge regarding the vaccine and failure to consider vaccine need during physician-patient encounters.

A physician education update regarding vaccine indications and use was completed. A questionnaire was developed and given to each patient, allowing the physician to quickly evaluate each patient's need for pneumococcal vaccine. Evaluation of the first 1,000 questionnaires revealed that approximately 20 percent of the patients had indications for pneumococcal vaccine. Evaluation of immunization records revealed significant increased utilization of the pneumococcal vaccine following initiation of the questionnaire. Patient questionnaires such as this can prove to be a useful tool in the evaluation and provision of preventive medicine services in the family practice setting.

Streptococcus pneumonia remains an important cause of morbidity and mortality in the practice of the primary care physician. Despite the availability of excellent antibiotic therapy, significant

morbidity can be evident, particularly within the first few days of illness. Resistant strains are emerging which complicate antibiotic therapy. Several population groups are at particular risk, including the elderly, functional or surgical asplenic, and those with carcinomas, lymphomas, chronic lung disease, renal disease, and liver disease.

A literature search reveals the lack of any specific study to determine whether the pneumococcal vaccine is being used as indicated by the current consensus of medical authorities. The use of pneumococcal vaccine to prevent pneumococcal infection in the outpatient family practice setting was evaluated through chart audits and found to

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0094-3509/82/121111-04\$01.00
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be significantly underutilized. The probable explanations for underutilization of pneumococcal vaccine are as follows: (1) physicians do not have a clear understanding of the proper recommendations and indications for use of the vaccine, and (2) physicians do not have a good system for clearly and easily identifying those individuals for whom the vaccine is indicated.

The goals of this study were (1) to determine the present level of understanding among the resident and staff physicians in the Department of Family Practice regarding the proper indications and use of the pneumococcal vaccine, (2) to educate physicians who were deficient in their understanding of the pneumococcal vaccine, and (3) to develop a system in which patients with an indication for pneumococcal vaccine could be readily identified.

Methods

The first task was to determine the extent of physician knowledge regarding use of pneumococcal vaccine by the compilation of a 15-question examination developed from the pneumococcal vaccine product information. This examination was given to all of the resident and staff family physicians in a Grand Rounds setting. Following completion of the examination, a discussion of the questions and answers, as well as other pertinent prescribing information, was undertaken.

The second task was to help the physician identify patients with indications for pneumococcal vaccine at the time of the physician-patient encounter. A questionnaire was developed to be presented to and completed by the patient prior to the physician-patient encounter. This questionnaire included reference to currently recommended indications and contraindications for pneumococcal vaccine.*

Age is important because the indications for administration of vaccine include anyone over the

age of 50 years. In this study, however, the age criteria was readjusted to 60 years of age and above following limited cost-effectiveness evaluation of the family practice population. The number of patients receiving vaccine using the adjusted age criteria of 60 years old was compared with the predicted vaccine usage using the suggested age criteria of 50 years old as recommended by the vaccine manufacturers. Sex determination was included in the questionnaire in order to identify women with contraindications for vaccine, especially pregnancy. Patient evaluation regarding adverse reactions following vaccine injection was not specifically undertaken as a controlled component of this study.

Patients were instructed to complete the questionnaire prior to seeing a physician. Physicians were then asked to evaluate this information and determine a disposition directly on the form. The disposition section of the questionnaire was reviewed and analyzed. Permanent record of prescribing the vaccine was placed in the chart on the problem list via a preprinted gummed label supplied by a pneumococcal vaccine manufacturer. A preprinted booklet, also made available by a vaccine manufacturer, was presented to the patient which described in layman's terms most of the questions that would arise regarding the vaccine.

A four-month retrospective review of pneumococcal vaccine utilization by all health care providers (ie, physicians, physicians' assistants, and nurse practitioners) at this regional hospital facility was completed. The prescribing patterns of the 28 family practice clinic providers, which included 5 residency staff and 23 family practice residents, were compared with those of the 48 multispecialty, nonresident, non-family practice providers. A four-month prospective study utilizing the questionnaire only in the family practice clinic was then completed. Questionnaires were given to each patient presenting to the Family Practice Clinic. Patients were asked to complete a questionnaire only once. The patients obtaining care in the Family Practice Clinic are limited to impaneled patients who receive ongoing care. Specific demographic data on the patient populations involved in this study were not determined; however, both active duty and retired military populations are served with a resultant patient mix that is felt to closely approximate a nonmilitary family practice setting.

*Copies of the questionnaire are available on request from the authors.

| | Family Practice Center | Non-Family Practice Center |
|---------------------------------|-----------------------------------|---------------------------------------|
| Prequestionnaire | | |
| Month 1 (n=10) | 4 | 6 |
| Month 2 (n=16) | 2 | 14 |
| Month 3 (n=8) | 4 | 4 |
| Month 4 (n=9) | 6 | 3 |
| Total (n=43) | 16 | 27 |
| During Questionnaire Use | | |
| Month 1 (n=82) | 81 | 1 |
| Month 2 (n=77) | 73 | 4 |
| Month 3 (n=44) | 41 | 3 |
| Month 4 (n=15) | 11 | 4 |
| Total (n=218) | 206 | 12 |

| | No. (%) |
|-------------------------------------|----------------|
| No indication | 756 (75.6) |
| Indication and prescribed vaccine | 202 (20.2) |
| Indication but vaccine not received | 42 (4.2) |
| Previously received | 20 (2.0) |
| Overlooked by physician | 9 (0.9) |
| Refused by patient | 6 (0.6) |
| Intercurrent illness | 6 (0.6) |
| Pregnancy | 1 (0.1) |

Results

Eighteen providers completed the pretests dealing with knowledge on the use of pneumococcal vaccine. The average number of incorrect responses was 5.8.

Evaluation of immunization clinic records revealed the pneumococcal vaccine utilization patterns for the retrospective (prequestionnaire) and

prospective (questionnaire) study periods (Table 1). The results of the evaluation of the first 1,000 questionnaires completed are displayed in Table 2. Re-examination of questionnaires was performed to evaluate the effect that altering the age criteria had on the prescribing pattern of the vaccine. By readjusting the age criteria from 50 years to 60 years of age, 117 fewer patients received the vaccine.

Discussion

In this family practice setting, it was noted that physicians were not utilizing pneumococcal vaccine as suggested by the criteria published by the Center for Disease Control.^{1,2} Through the use of the questionnaire presented in this paper, most of the patients in the Family Practice Clinic population having an indication for the vaccine were identified during a relatively short period. The pneumococcal questionnaire can be used for a short period (ie, three to four months) and still be quite effective in identifying a majority of patients with indications for the vaccine. This short-term use of the questionnaire is possible because patients with chronic illness have the strongest indications for the vaccine and tend to be followed at more frequent intervals.

This analysis of the prescribing patterns of pneumococcal vaccine brings out an even more important general issue—the application of preventive medicine practices in the busy family practice office and residency setting. Immunizations for children are an accepted routine part of the well-baby or well-child encounter. After five to six years of age, immunization updates are primarily made for specific situations, such as acute trauma, foreign travel, and health examinations for school entrance, or new employment. Likewise, patients do not request vaccinations. As noted with pneumococcal vaccine in this study, immunizations and other preventive medicine concerns are often forgotten or displaced by acute or chronic medical problems.

Another important contributing factor may include the fear of an adverse reaction to the vaccine, such as the Guillain-Barré syndrome that sometimes resulted from the swine flu vaccine. Side effects should be put in perspective for patients. Adverse reactions are rare with pneumococcal vaccine and consist primarily of local reactions. They are usually mild and consist of swelling, pain, erythema, and fever.³ Though no specific follow-up of vaccine reactions was undertaken in this study, no significant side effects were reported to the health providers or immunization clinic personnel. It should be noted that pneumococcal vaccine and the yearly flu vaccine can be administered at the same time at different sites.^{4,5} The population requiring these vaccines is quite similar, if not identical, and patient requests for a

flu shot should initiate a simultaneous evaluation of need for pneumococcal vaccine.

Hirschman and Lipsky⁶ recently presented a critical review of the literature as well as several unpublished studies concerning the use of pneumococcal vaccine. They concluded that there is lack of evidence to support widespread vaccinations as proposed by proponents of pneumococcal vaccine. While recognizing the protective efficacy of the pneumococcal vaccine to certain high-risk groups (eg, New Guinean Highlanders,⁷ South African gold miners,⁸ and children with sickle cell disease⁹), Hirschman and Lipsky question the broad high-risk limits for which the vaccine is presently indicated.

Although these high-risk limits for the pneumococcal vaccine may not be appropriate, until further evidence appears, it seems reasonable to continue to give pneumococcal vaccine for those over 60 years of age, as well as for those in other high-risk groups particularly susceptible to pneumococcal diseases.

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