Respiratory Infections

An Opportunity for Integrated Disease Management

Respiratory infections are a major source of morbidity for patients in the community and for those who are admitted to the hospital. In the United States, pneumonia and influenza together are the sixth leading cause of death and the number one cause of death from infectious diseases. Community-acquired pneumonia (CAP) occurs in 4 to 6 million people annually, while nosocomial pneumonia (NP) is the hospital-acquired infection most likely to lead to mortality. In the setting of chronic obstructive lung disease, bronchial infection is common and a frequent source of morbidity. As new tools for diagnosis and therapy become available, pathogens continue to evolve, making diseases such as tuberculosis and pneumococcal pneumonia a continuing challenge, rather than a distant memory. The clinical, epidemiologic, and economic implications of respiratory infections have made them a target of intense interest for physicians, scientists, and health-care administrators. The complexity and controversies associated with these conditions were recently examined in a symposium, published as a supplement to CHEST, titled “Contemporary Issues in Pulmonary Infections.” The discussions in this supplement serve to highlight ongoing areas of controversy, while suggesting directions for future research and patient care.

The complexities surrounding the management of respiratory infections make them an ideal target for a new and integrated approach in health care, termed “disease management.” This involves multidisciplinary input for providing care, but more importantly, a global view of patient outcome and the management of illness. The concept of disease management requires that patients, physicians, hospitals, insurers, and the pharmaceutical industry work together to develop an effective and efficient care plan that reduces overall costs while assuring an excellent outcome. The application of such an approach requires a radical rethinking of a number of traditional approaches. For example, if a patient with an acute exacerbation of chronic bronchitis (AECB) is treated with an antibiotic, what is the most cost-effective choice? Is it the drug which costs the least to buy? Is it an agent which leads to the most rapid recovery, at a higher acquisition cost, but thereby prevents lost work days and the need for hospitalization? Is it an agent that minimizes the chance of antimicrobial resistance, thereby preventing future episodes of costly care? If such an agent can be identified and selected, will it be prescribed and who will accrue the cost benefit of such a choice: patients, physicians, insurers, or the pharmaceutical industry? These are just a few of the questions related to the management of respiratory infections that we must grapple with in the coming era of managed care.

The recently published symposium in CHEST serves to illustrate why an integrated approach to disease management is necessary and why guidelines are becoming an important part of this process. A number of controversial areas were defined, and the application of guidelines could assure a uniform approach to these issues. Whether such a defined approach is useful is an issue that still needs to be resolved. However, I believe that guidelines are a very useful way to manage disease processes associated with controversy. Guidelines can synthesize the available data and propose a care plan that integrates all of this information. Once a guideline is developed, it should be not be viewed in a static fashion, but rather as a hypothesis that still needs validation. Thus, the guideline process is a dynamic one that involves the ongoing collection of data to confirm and refine any proposed plan of care. In an integrated health-care model, such guidelines should flourish. Physicians can collaboratively develop a guideline for care and institute its application in a managed care setting. Data can then be collected to look at the global impact of such a guideline on a number of measurable variables: drug acquisition costs, physician and other medical professionals’ time needed for care, need for hospitalization, ability to prevent hospitalization, duration of illness, disease-associated morbidity and mortality, number of lost days from work, and the long-term issue of the development of antimicrobial resistance.

Guidelines have been developed for the management of a number of respiratory infections including CAP, NP, bronchitis, and tuberculosis. I believe that a well-conceived guideline, complemented by an ongoing commitment to data collection and validation, can be extremely valuable, but there are others who have a less sanguine view. Berk expressed grave concern...
with the recently published ATS guidelines for CAP, suggesting that empiric therapy is doomed to failure. As the chairman of the committee that wrote these guidelines, I disagree, but only if the guidelines are viewed as dynamic and evolutionary, allowing for change as more data about evolving patterns of bacteriology, patient epidemiology, and antimicrobial susceptibility become available. Guidelines may, in fact, have a dark side if they are viewed as a “cookbook” for patient care and not as a process in continual need of validation and updating. Each institution needs to collect epidemiologic data to confirm the validity of guidelines in a specific setting, and thereby incorporate the local experience into any plan of care. If the impact of antibiotic guidelines on antimicrobial susceptibility patterns is monitored, then it is quite possible that the use of effective therapy, although empiric, will reduce, not increase, the problem of drug-resistant pathogens.

The recently published CHEST symposium points out a number of controversial issues in respiratory infection that can be addressed by the development and application of guidelines. In CAP, Mandell has pointed out that diagnostic testing and categorizing patients into patterns of clinical presentation have limited value. In their place he recommends using guidelines based on certain clinical and epidemiologic features of patients to define initial empiric therapy. Craven and Steger have pointed out the bacteriologic profiles of patients with NP, showing that categorizing patients into early- and late-onset infection has great impact on disease microbiology, and the soon to be published ATS guidelines for nosocomial pneumonia take this concept into account. Ball and Wilson clearly show the value for defining subsets of patients with AECB, distinguishing among individuals on the basis of the number of exacerbations that they have had in the preceding year. Patients with more than four exacerbations per year are particularly likely to continue to have frequent exacerbations, and recognition of this fact may lead to a different antimicrobial approach for such patients, a concept that has been incorporated into the Canadian guidelines for the management of bronchitis. The failure of health-care professionals to control tuberculosis and the emergence of multi-drug-resistant tuberculosis disease was discussed by Sbarbaro, and the approach to managing these problems has been outlined in recently published guidelines by both the ATS and the ACCP. Simpson et al has pointed to the fact that respiratory infections are continually evolving, with the emergence of new pathogens such as the hantavirus, again emphasizing the need for local epidemiology to be considered in the application of empiric therapy.

The discussions in the CHEST supplement have pointed out areas for further investigation which can be incorporated into future guidelines for care. For example, Garrard and A’Court suggested the need for both routine surveillance microbiology and clinical assessment in following mechanically ventilated patients. Such an approach initially appears to be costly, but in an integrated model of disease management, the cost may be justified, and if so, such an approach can be incorporated into recommended patient care plans. The role of novel therapeutic and preventive strategies for pneumonia and ARDS were discussed by Bergogne-Berezin and Hudson, respectively, and again these modalities can be evaluated in an integrated patient care model to define their efficacy. Bergogne-Berezin has suggested the utility of oral sequential therapy in the management of pneumonia, and such an approach may gain widespread acceptance if its anticipated cost and patient outcome benefits are confirmed in a disease management model. Felmingham has injected a note of caution, pointing out the frequency with which common organisms develop antimicrobial resistance. Again, the impact of guidelines on resistance could be beneficial, or harmful, and only ongoing data collection can resolve this issue.

Thus, we are currently at a crossroads in our management of respiratory infections. The diseases and therapies are becoming ever more complicated while we are entering an era of cost-conscious care. Integrated disease management, with the widespread applications of guidelines, is coming, and this can be viewed as a threat or an opportunity. The complexities associated with respiratory infection are, in my opinion, an opportunity for developing guidelines that can, with the help of ongoing data collection, improve patient outcomes. By assuring a uniform approach to care in a given institution, therapy can be both efficient and cost effective. With a commitment to validating the utility of any recommended approach, physicians can anticipate and avoid problems while assuring excellent patient care in their own unique environments. The concept of integrated disease management is new, but it is certainly an approach that can be applied to the complex area of respiratory infections. In the future, the application of this approach to the management of respiratory infection should be explored by persons with expertise in the fields of medicine, pharmacy, epidemiology, cost accounting, and health-care administration. The opportunity for physicians to educate their colleagues in the health-care industry about the clinical issues that must be considered in applying such an approach should be viewed as an exciting challenge, and one in which we must all become involved.

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REFERENCES


Observance of Long-term Oxygen Therapy at Home

Long-term oxygen therapy (LTOT) is the only treatment which has been shown to improve survival in patients with advanced COPD.1,2 It has also been shown that the longer the daily duration of LTOT, the better the survival.1 Furthermore, LTOT reduces polycythemia1 and has favorable effects on pulmonary hemodynamics since it stabilizes and sometimes reverses the progression of pulmonary hypertension.3,4 LTOT improves the exercise tolerance of COPD patients5,6 and their neuropsychological status7,8 and, accordingly, their quality of life.9 Consequently, there has been a considerable development of LTOT in recent years, which is also accounted for by the technological improvements in the way of supplying oxygen at home. It is estimated that some 800,000 people currently receive home oxygen therapy in the United States.10

One of the major problems with oxygen therapy is the observance of the treatment by the patients. LTOT is undoubtedly a constraining therapy, and this probably explains why the compliance to treatment is often poor. There have been several previous reports on the compliance with LTOT,11-14 but small numbers of patients were generally included. In 1992, Howard et al15 reported the oxygen usage of 531 oxygen concentrators installed in the UK in 1986, and observed that in the category of patients to whom LTOT was prescribed for 15 or more hours per day (n=339), the actual usage of oxygen concentrators (13.4 h as a mean) was markedly lower than the prescribed usage (17.9 h). They concluded that “compliance with therapy is below the level at which clinical benefit is to be expected in at least 50% of treated patients.”15

In this issue of CHEST (see page 1144), Pepin et al report the French experience of compliance with LTOT. They assessed the daily use of oxygen therapy in 930 COPD patients and examined factors associated with effective use of LTOT. This prospective study, which has included a very large number of patients, was performed under the auspices of ANTADIR, a national non-profit organization which supplies oxygen and technical follow-up to near 30,000 patients with respiratory insufficiency in France. Actually, 14 regional associations of the ANTADIR network participated in this multicentric study.

Pepin et al have observed that only 45% of the patients achieved oxygen therapy for 15 h or more per day, but the mean duration of oxygen prescribed was only of 16±3 h per day with a mean duration of effective oxygen therapy of 14.5±5 h per day. The factors distinguishing patients who used oxygen for 15 or more hours per day included in particular an initial prescription of more than 15 hours per day and a supplementary education on LTOT given by a nurse or a physiotherapist. Pepin et al judiciously conclude that the education also needs to be focused on the physician, who is the prescriber.

The observations made by Pepin et al and those taken from other recent studies of the literature16,17 suggest that efforts for improving the observance of LTOT should be focused on three major targets: first, a better education of the prescribing physicians; sec-