the reader accept as meaningful? I contend that surrogate measures should be accepted only if they yield the same conclusions as their nonsurrogate endpoints. Scuderi et al.'s study provides good evidence that the surrogate measures are flawed and that, using true outcomes, prophylaxis with ondansetron is of little benefit. Coupled with Tramer et al.'s conclusion that treatment with 1 mg ondansetron is beneficial, there appears to be little evidence to support routine prophylactic administration of antiemetics. As evidence-based medicine becomes popular (i.e., therapeutic decisions should be based on evidence rather than personal impression), we will be hard pressed to give antiemetics prophylactically. From the research standpoint, whenever surrogate outcomes are used, their relationship to more meaningful outcome measures should be considered carefully.

References


The Role of Spirometry in Predicting Pulmonary Complications after Abdominal Surgery

Progressing toward an Answer

POSTOPERATIVE pulmonary complications in patients with obstructive pulmonary disease undergoing nonthoracic surgery vary over a wide range, depending on the complication, from the probably clinically insignificant microatelectasis to pneumonia or prolonged intubation. Patients classified as having chronic obstructive pulmonary disease (COPD) are three times more likely to have postoperative pulmonary complications. Spirometry can define the extent of airway obstruction, is highly reproducible, is easily performed, and correlates with all-cause mortality. Yet Lawrence et al. reviewed studies until mid-1989 but noted that numerous limitations prevented them from concluding that spirometry helped to predict which patients were at risk for postoperative pulmonary complications. In this issue of Anesthesiology Warner et al. present a case control retrospective analysis to address these limitations when questioning whether spirometry predicts postoperative pulmonary complications after abdominal surgery.

This study raises the standard for postoperative pulmonary complication studies by its combination of extensive multivariate matching between study groups, its study groups' severe and well-defined obstructive defect, its number of subjects over a 5-yr period, and its outcome definitions. However, this study should not be interpreted as proving that spirometry has no role in patient management, or that patients with COPD have no increase of postoperative pulmonary complications.
compared patients with normal spirometry. The fivefold increase in definite pneumonias for the group with abnormal spirometry, the 1.5-fold more intensive care unit stays of more than 96 h, the 1.3-fold greater incidence of prolonged intubation, but the identical incidence of probable pneumonias and of readmission to the intensive care unit emphasizes the importance of this second issue. Although this is the largest study of patients whose ventilatory defect has been clearly defined by separate groups and compared, the number of patients is too few to permit a definitive conclusion, which is a frequent limitation of single-institution studies. For example, if their rate of definite pneumonias is representative of the population, merely doubling the patients per group could detect easily a difference with a type-one error of 5%. Because the authors note that the control group was not free from pulmonary disease, these patients may have had sufficient clinical indications to warrant preoperative spirometry, and they may have been at a somewhat higher risk of pneumonia or other postoperative pulmonary complication than "true normals."

The more important issues raised by this study is the interaction between the physician evaluation and spirometry and whether either or both were responsible for differences in care or outcome. Because all patients had a preoperative medical examination before surgery, this clinical examination could have led to the obstructive disease patients being treated more aggressively: they had a longer time between spirometry and surgery and a significantly higher incidence of immediate postoperative admission to an intensive care unit and significantly fewer arrived in the operating room after having been admitted the morning of surgery. Alternatively, abnormalities seen during pulmonary function testing could have identified patients with more severe disease, enabling the patient to be optimized before arriving in the operating room, or to be treated more aggressively either pre- or postoperatively. Optimizing pulmonary status pre- and postoperatively is associated with fewer postoperative pulmonary complications, possibly explaining the low incidence of pneumonias in the patients of Warner et al. Complications may be higher too in patients who do not improve after bronchodilators or other preoperative therapies, so either denying or proceeding with surgery in such patients could affect results substantially. Therefore, this possibility of differences in care does not permit interpretation of whether these differences actually existed, what caused them, or the extent to which they may have altered outcome.

Optimal management directs increased care to those patients most requiring it. Unfortunately, studies of physician ability to clinically diagnose airflow obstruction by comparing clinical examination with spirometry are variable. Diagnostic agreement improves when physicians receive training before such studies begin or when the severity of disease increases. Single components of the pulmonary clinical examination have either high sensitivity or specificity, but not both. These uncertainties may explain the variety of published criteria for obtaining spirometry from patients who have not been evaluated previously and who are to undergo abdominal surgery: symptoms of COPD, being a smoker, other pulmonary complaints. Yet, whether patients in this study underwent spirometry based on clinical examination, published recommendations or other factors cannot be determined from its retrospective design. Such information could help to determine whether their patients' severe obstructive defect seen during spirometry enhanced the primary physician's clinical assessment or alerted other caregivers, possibly leading to different perioperative care.

Because patients with COPD have a higher risk of postoperative pulmonary complications, clinicians must determine whether ancillary tests (e.g., spirometry) enhance a COPD diagnosis based on clinical examination. Of greater importance is whether knowledge of such a test can alter actions of the care team or reduce complications of COPD patients, or both, possibly even to levels for otherwise similar patients, but without this disease, undergoing abdominal surgery.

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References