Elastic Recoil of Lung and Lung Reduction Surgery

To the Editor:

At a recent meeting of the American College of Chest Physicians in San Francisco in October, there were several sessions concerning lung volume reduction surgery. In two of these sessions that I attended, the concept of emphysematous lung “bulging out the chest wall and pushing down the diaphragm and even compressing the heart” was discussed by surgeons and pulmonologists present. The beneficial effect of the surgery was thought to be due to “removal of the bulging emphysematous lung to allow good lung to expand and to allow the chest to assume a less distorted position and the diaphragms to ascend once the downward pressure by the bulging lung was relieved.” Indeed, this does happen, but for an entirely different reason. It has to do with retractile elastic recoil of the lung being opposed by the expansive force of the chest wall. When these two opposing forces equal one another and cancel out, the diaphragms come to rest.

In emphysema, the loss of elastic recoil of the lung allows the chest wall to expand and hence the diaphragm becomes low. Now when the surgeon removes the areas of emphysematous lung, the elastic recoil increases, the chest wall is drawn in, and the diaphragms rise. This increase in elastic recoil of the lung also keeps the airways open longer during expiration, and they become larger on inspiration, improving ventilation/perfusion ratios and reducing the airway’s resistance and work of breathing.

Another analogy is that of a rubber band with several flabby sections in it. If these sections are removed, the rubber band has better elastic recoil.

To appreciate the expansive qualities of the chest wall, consider the following: if a pneumothorax is present (nontension, noncommunicating) and the chest wall is opened, air rushes in as the chest wall expands.

One of the surgeons at the meeting, who stressed the forceful expansile properties of the emphysematous lung pushing down the diaphragm, claimed support for his theory by observing the bulging of the emphysematous lung through a thoracotomy incision at the time of lung volume reduction surgery. When this point of view was presented to Dr. Jerry Mead during his “Distinguished Lecture in Physiology—Thoracic Kinetics,” he thought this was due to the pressure involved in the administration of the anesthesia.


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A Survey of the Use of Herbal Agents Among Philadelphia Veterans Affairs Medical Center Pulmonary Outpatients

To the Editor:

Herbal products are used by as many as 20 to 60% of patients in a variety of practice settings, both in the United States and abroad.1,4 While the efficacy of many of these agents has not been demonstrated in scientifically rigorous trials, serious toxicity has occasionally been described.1,4 However, many health-care providers do not specifically ask patients about use of these agents, and therefore may not be cognizant of possible toxicities and drug interactions between herbal products and “conventional” agents being administered at the same time. In pulmonary medicine, for example, particular concern has recently focused on an ephedra-containing dietary supplement that may have triggered cardiac arrest in an asthmatic patient receiving albuterol and theophylline.4

To some extent, the use of herbal products may be fueled by medically sophisticated or affluent patients, perhaps in concert with Internet access.1 Meanwhile, the frequency and importance of the use of herbal remedies in less affluent, urban populations, and in federal medical facilities is poorly characterized. Therefore, a prospective survey was conducted of patients in a pulmonary outpatient clinic at the Philadelphia Veterans Affairs Medical Center (VAMC). The purpose was to describe the frequency of herbal drug use and to assess the possibility of potentially dangerous herbal agent-pulmonary drug interactions or pulmonary toxicity from herbal agents in this setting.

One hundred twenty consecutive veterans attending an outpatient pulmonary clinic staffed by a single practitioner at the Philadelphia VAMC between June 1, 2000, and October 15, 2000, were queried regarding use of herbal products. The clinic serves the Philadelphia VAMC, a teaching affiliate of the University of Pennsylvania located in West Philadelphia. The vast majority of its patients are residents of Philadelphia, although 1 to 5% are referrals from VAMCs in Coatesville, PA, and Wilmington, DE.

The cohort was composed of 117 men and 3 women, 66 African Americans, and 54 whites. The mean age was 63.7 years (SD, 14 years). The highest level of education achieved was ninth grade or
less in 23 patients (19%), ninth through 12th grade in 70 patients (58%), and at least 1 year or more of college in 27 patients (23%). The principal pulmonary diagnosis was COPD in 36 patients (30%), carcinoma of the lung in 17 patients (14%), asthma in 12 patients (10%), undiagnosed pulmonary nodules in 10 patients (8%), sarcoidosis in 7 patients (6%), and a variety of miscellaneous pulmonary conditions in 38 patients (32%, but < 5% for each diagnosis).

Of the 120 patients, only 11 patients (9.2%) admitted to using herbal products currently. The age, race, and pulmonary diagnoses of the herbal users did not differ significantly from nonherbal users, but they were more likely to be college educated (p < 0.05). Five of the 11 patients were using multiple herbal agents. Three patients were unable to characterize the herbal remedies further. Of the eight remaining subjects, four were using ginseng, usually for “immune boosting” or “energy.” One of the four subjects was using ginseng with green tea for “breathing,” another with garlic for “circulation.” Two other patients were using garlic for “pressure;” one was using saw palmetto to improve “prostate functioning,” and one was using glucosamine for arthritic knees.

Two aims were achieved by the survey. First, the prevalence of herbal use in the specific population in question was determined and found to be low (9.2%), below the reported prevalence in other patient populations.1,2 Second, within the limits of the patients’ ability to completely and accurately disclose the herbal agents they were using, it appeared that none of the patients were, at the time of the survey, at risk for serious herbal pulmonary toxicity or potentially dangerous interactions between their herbal and conventional pulmonary medications.

The survey obviously carries a number of limitations. It is a single institution assessment of one outpatient practice in an urban VAMC. Only a small number of patients actually admitted to the use of herbal preparations, and their reports were not verified. As there was no control or comparison group, it is unclear to what degree the findings relate to Veterans Affairs (VA) patients in general, pulmonary patients in the VA, or pulmonary patients in general. It is also unclear whether the results are representative of urban VAMCs in general, those in the northeastern United States, or whether they pertain to the Philadelphia VAMC alone. No specific query was made as to socioeconomic status, although an unrelated concomitant survey of pulmonary outpatients at the Philadelphia VAMC showed that 66% had a household income of < $20,000/yr, and only 4% had a household income in > $50,000/yr (unpublished data). Internet access, thought to be an important marker or mediator of herbal drug interest and distribution, was not formally assessed in the current survey, but is likely to be very low in the current cohort.

Although no definite herbal drug-related hazards were identified in this survey, caution is still warranted. Patients may have incompletely or incorrectly represented the types of herbal agents in use. Also, with ever-expanding popular interest in herbal remedies, a patient not using a herbal remedy at one clinic visit may begin using one or more prior to a second visit. Thus the current survey must be seen as a single “snapshot” of the problem, and does not preclude serious complications in the near future. Despite the largely negative findings of this survey, it seems reasonable for pulmonary clinicians to ask patients about herbal product ingestion and to be vigilant for toxic effects from their use and for potentially hazardous herbal-conventional pulmonary drug interactions.

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REFERENCES