Spirometric Screening - Does it Work?

David M. Mannino
SPIOMETRIC SCREENING: DOES IT WORK?

D M MANNINO

Role of spirometric testing in smoking cessation

Pulmonary function testing offers an easy, inexpensive, and non-invasive means of diagnosing and staging chronic lung disease. It provides information on both the presence of obstructive lung disease and restrictive lung disease and can provide insights on how patients might respond to treatment. Spirometric testing also provides prognostic information, with lung function measures predicting mortality and the development of lung cancer.

Despite the valuable information that spirometric testing provides, it is underused in medical practices in much of the world. There are several reasons for this, including (1) problems with the procedure itself, (2) problems related to compensation, and (3) the absence of “evidence” that spirometric testing actually makes a difference in the diagnosis and treatment of patients. Advances in the design of spirometric tests that provide quality control feedback are addressing the first reason. The second reason varies between locales and health plans. Addressing the final reason is critical to increasing the use of spirometry in a general medical practice.

A recent review commissioned by the United States’ Agency for Health Research and Quality by Wilt et al. concluded that “the evidence does not support widespread use of spirometry in primary care settings for all adults with persistent respiratory symptoms or having a history of exposure to pulmonary risk factors for case-finding, improving smoking cessation rates, monitoring the clinical course of COPD, or assessing COPD severity.”

With specific regard to smoking cessation, the report’s review of four studies in the literature concluded the following:

“Spirometric testing as a motivational tool to improve smoking cessation rates is unlikely to provide more than a small benefit. Results from observational studies of spirometry are mixed. RCT of other biomarkers used as motivational tools for smoking cessation are generally negative. The only randomized controlled trial that assessed the independent contribution of spirometry and counseling on smoking cessation rates reported a nonsignificant 1 percent greater quit rate at 12 months in the group assigned to receive spirometry.”

The paper in this issue of Thorax by Bednarek et al., which is observational and not a randomised clinical trial, would not have been included in the review by Wilt et al and thus would not have changed the conclusion. The information in the study by Bednarek et al., however, compelling. Their evidence suggests that spirometric testing, with a very quick and simple feedback consisting of a lung function decline curve marked with the patient’s value, improved smoking cessation. In the world of smoking cessation, the validated cessation rates at 1 year of 16.3% in the overall group was higher than the expected 4–6%. In addition, there was evidence that lower lung function at baseline resulted in higher cessation rates. Even though this was not a randomised trial, these results are remarkable and should be a model for designing a study to determine whether this quick and
IL-10 and IPF

IL-10: another therapeutic target in idiopathic pulmonary fibrosis?

A B Millar

The need for appropriately designed clinical trials in IPF

These are exciting and hopeful times for those involved in the treatment of idiopathic pulmonary fibrosis (IPF). Despite the ever expanding wealth of cellular and molecular biology, translation into clinical trials for IPF has been limited. However, in the last 2 years results on three potential therapeutic agents have been published, albeit with limited benefit, with others imminent. The study by Nakagome et al. in this issue of Thorax gives further support to the concept of interleukin (IL)-10 as an additional biological therapeutic agent.

In the last 20 years the ability of the scientific community to analyse the biological interactions between cells has led to an information explosion. This has been exemplified by the analysis of cytokine (and growth factor) networks. Typically, the initial identification of a protein is followed by its receptor(s), its inhibition or induction by lipopolysaccharide and dexamethasone, and then a cascade of publications on interactions with other biologically active proteins. Unfortunately for the lung biologist, despite its relative inaccessibility, the unique role of the lung makes the requirement for cell and organ specificity even more crucial than in other tissues when dissecting these networks. This is exemplified by the constitutional secretion of the anti-inflammatory IL-10 by human lung alveolar macrophages, contrasting with tissue macrophages from other organ sites.

In vitro or ex vivo studies of individual cytokines and growth factors lead to the identification of molecules with potential useful biological activity. In the case of IL-10, it was identified as an anti-inflammatory agent. In the context of the lung, IL-10 has been shown to be expressed by alveolar macrophages constitutionally and stimulated by lipopolysaccharide, both directly and indirectly by tumour necrosis factor (TNF)—effectively controlling inflammation in a homeostatic feedback loop. Its role in inflammation has been explored in a number of inflammatory conditions including sarcoidosis, asthma, and acute respiratory distress syndrome (ARDS). Similar studies in IPF have been limited and conflicting. This may be related to the change in view of IPF from a condition with an inflammatory basis to that of “dysregulated repair” based on the epidermo-mesenchymal unit.

The latter view of IPF has led to a much greater focus on fibroblast function and fibrogenic cytokines, in particular transforming growth factor (TGF)-β. This cytokine has been shown to induce fibroblast proliferation, chemotaxis, and collagen production. In the context of IPF, it is mainly produced by the alveolar macrophages and expressed in fibroblastic foci. There is a paucity of studies on the potential interaction between IL-10 and TGF-β, but some recent work has suggested potential interactions. All such studies are limited by the isolation of cells from the tissue milieu, albeit facilitating clear cut answers. The evaluation of animal models of disease provides an alternative method of investigation.

Nakagome et al. have used the bleomycin mouse model for their work, recognising its limitations—in particular the observation that fibrosis can resolve with withdrawal of bleomycin, in contrast to the human condition. A significant number of potential biological treatments have previously been shown to ameliorate fibrosis in this model, including TGF inhibition. However, in such studies the agent has been given either prior to or synchronously with the inducing agent. In the well controlled study by Nakagome et al the administration of IL-10 2 weeks after induction led to amelioration of fibrosis. This is a crucial finding for a condition such as IPF in which presentation is invariably that of established disease. The authors used an intravenously delivered IL-10 plasmid which resulted in increased systemic production of IL-10 perfusing all organs and was shown to be increased in the lung. The use of genetically modified animals has been a further step forward for this type of