Chronic Lung Disease in Cotton Textile Workers

To the Editor:

In a recent editorial, Dr. Robert Jones (Chest 1984; 85:587-89) raises a number of issues concerning the health of workers in the cotton textile industry. The issues are both legislative and scientific. The former seem to be quickly prejudged by a superficial statement on governmental involvement in workers' compensation. "With the Black Lung Law as an example, there is every reason to doubt that the dollars would be wisely spent." This position ignores the very real difficulties that workers must overcome to have their respiratory disabilities evaluated and compensated in the current system.

The bulk of the editorial is a selective review of epidemiologic evidence for chronic respiratory disease in cotton textile workers. Since we have recently analyzed this literature and come to conclusions very different from those of Dr. Jones, we would refer the interested reader to our article so that the extensive literature may be better evaluated.

We would like, however, to point out that Jones' interpretation of our study in this editorial is superficial and misleading. Specifically, he suggests that our cohort of older cotton textile workers from Columbia, South Carolina "probably includes a disproportionate number of persons who volunteered because they suspected (or knew) that they were unwell." In fact, a number of features of the cohort strongly suggest that no such self-selection exists. These characteristics of our population have been detailed in a number of reports published on this study, as well as in correspondence relating to these reports.

Our study of cotton textile workers was designed to investigate respiratory health in older workers in four mills. An initial survey defined the population as workers who had: 1) started work in one or more of four Columbia mills before 1946; and 2) had worked at least three years in either card or weave rooms. This population, identified from union membership lists and company personnel records, consisted of 551 individuals, 174 of whom had died and 217 of whom had moved or were untraceable. Of the remaining 160 persons, 95 percent participated in the study indicating no self-selection in this group. The cohort was expanded to include workers who had worked for three years by 1955. This was done to broaden the scope of the study and to include spinning room workers, yarn preparers and other mill workers. Although this second group did not come from as well defined a cohort as the first, the expanded group was shown to be homogeneous. An extensive analysis of the card and weave room workers in the two cohorts was undertaken to validate the consistency of the expanded groups. Because of its selection, the second group was, on the average, younger than the first group. However, no consistent differences in adjusted lung function existed between the two groups. No significant differences in symptoms were noted. It was concluded that the expanded cohort caused no significant change in symptom prevalence, smoking habits or lung function. Finally, a group of 47 workers from the second cohort who were classified as "other" (workers in clothroom and miscellaneous jobs) showed lung function indistinguishable from a group of community control subjects studied in three towns. Had there been self-selection of sicker workers, as Jones suggests, we would have expected this group of "other" individuals to have abnormal lung function.

We conclude that based on an analysis of existing epidemiologic data, including our own study, there is extensive evidence that cotton textile workers develop chronic lung disease as a result of work in the industry and that the impairment is independent from that of other injurious factors such as cigarette smoking.

E. N. Schachter, MD, F.C. C.P.; G. J. Beck, Ph.D., F.C. C.P.; and Lucinda Maunder, MA,
Yale University School of Medicine, New Haven

REFERENCES


To the Editor:

Dr. Jones provides a superficial and distorted view of the literature on the association between cotton dust exposure and chronic obstructive lung disease and misrepresents my view on compensation for respiratory impairment arising from cotton dust exposure. Although many of these points have been addressed in the recent medical literature, it is clear that further discussion is needed.

Dr. Jones deals with the literature on obstructive lung disease from cotton dust exposures by selecting passages from selected references to support his position. All cross-sectional morbidity studies, recent detailed reviews on this subject, and conclusions drawn by other authoritative bodies are ignored. He quotes some of my work, but incompletely. While it is true that we found no overall increase in respiratory mortality, we also discussed the healthy worker effect, a doubling of respiratory mortality with increasing duration of exposure to cotton dust, and certain significant excesses in cardiovascular mortality which raised the question of misclassification on death certificates—as previously noted among textile workers by Richard Schilling. Jones quotes a passage from the NIOSH criteria document that states that the "eventual fate of workers with byssinosis, including both active workers and those who have left the industry, is poorly defined." In my experience, this is often due to selection away from cotton dust exposure because of respiratory symptoms. He, however, fails to report the final sentence in that Criteria Document section dealing with "Effects on Humans" which reads:
"Inhalation of cotton dust may also result in chronic lung disease."

In his discussion of prospective studies of cotton dust exposure, incomplete or misleading information is again brought forward. Berry et al highlighted through the use of figures the problems presented by selection, even in a careful prospective study. One figure demonstrated a clear increase in decline in FEV, among employees exposed for less than five years, which then declined with longer exposure only to increase among those with the longest exposure. The second figure pointed out a rather greater decline among cardroom workers, even though they found no significant association between decline in FEV, and dust or whether workers had symptoms of byssinosis. These findings are consistent with the frequent reports of selection of affected workers away from cotton dust exposure—which tends to make Berry's significant finding of a 54 ml/annual decline in FEV, among their cotton mill workers, compared with a 32 ml decline among synthetic mill workers, all the more significant. Jones goes on to dismiss observations we made in a ten-month cotton steaming intervention study as "clearly too short to allow much confidence in the estimates of lung function change." Yet he failed to note the most relevant data in that study which demonstrated a dose-response relationship between dust concentration (measured monthly) and decline in FEV, (measured monthly in a panel of workers and quarterly in the remainder). These data are provided to illustrate this point:

<table>
<thead>
<tr>
<th>Work Area</th>
<th>(n)*</th>
<th>Vertical Elutriator Median Dust Level—mg/m²</th>
<th>Decline in FEV, over 10 month study—ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening/Picking</td>
<td>13/31</td>
<td>2.65</td>
<td>-292</td>
</tr>
<tr>
<td>Carding</td>
<td>45/63</td>
<td>0.65</td>
<td>-145</td>
</tr>
<tr>
<td>Spinning</td>
<td>70/106</td>
<td>0.48</td>
<td>-88</td>
</tr>
<tr>
<td>Winding/Twisting</td>
<td>65/108</td>
<td>0.52</td>
<td>-67</td>
</tr>
</tbody>
</table>

*(n) provides a denominator of those who began the study and a numerator of those completing the study providing a measure of outward migration by work area.

These data also provide evidence of increased selection away from the dustiest work area in which a 10-fold increase in expected annual decline in FEV, was observed. Finally, Jones attempts to discredit the studies of Beck et al as being biased due to "uncontrolled referral and/or self-selection" without recognition of recent discussion of that point by Beck et al that supports their earlier original conclusions.

Jones further suggests that I "seek tofavor a Brown Lung Law drawn on lines similar to the existing Black Lung Law" which misrepresents what was written in my editorial for the Journal of the American Public Health Association. What I believe epidemiologic data support is compensation for textile workers with cotton dust exposure prior to the introduction of adequate dust control. Remarkable progress has been made in the American textile industry in the control of cotton dust. Whether workers exposed in work areas compliant with all aspects of the Cotton Dust Standard, which includes systematic medical surveillance, will develop progression in decline in lung function is doubtful, but presently unknown. This is the subject of a study of Burlington Industry Plants (known as a progressive company with a corporate medical and industrial hygiene program for 14 years) by Drs. Weill, Jones and colleagues. While this is an important study which will address the question of whether the Cotton Dust Standard is doing its job as applied in one progressive company, it will not address the question of the cotton dust exposures which existed in the 1960s and 1970s, the time of the several quoted epidemiologic studies. Hence, my concern is principally for those workers exposed to higher dust levels during this period, but who still remain in the industry or have recently left the industry. I have recommended two approaches to compensation for such workers: (1) through work with the North Carolina Industrial Commission to establish cotton dust exposure criteria and a medical panel, and (2) through Congressional testimony on comprehensive minimum federal compensation standards for diseases found to be occupationally related. In 1969 we developed cotton dust exposure criteria and a Byssinosis Medical Panel to work with the North Carolina Industrial Commission. This arrangement continues today and has resulted in compensation for several hundred North Carolina textile workers. Unfortunately, such a process has not been adopted by other states where very few workers' compensation claims have been awarded. Hence, the need for minimum federal compensation standards for exposure to cotton dust, asbestos, silica and many other occupational hazards.

James A. Merchant, M.D.
Professor of Preventive Medicine and Internal Medicine,
University of Iowa, Iowa City

REFERENCES

To the Editor:

Authors, on the subject of their own work, sound much like doting parents on the subject of their own offspring: rather more attentive to merits, and less sensitive to faults, than is the general observer. It thus comes as no surprise that Schachter and colleagues hold their study in the highest regard, and give it the greatest possible evidentiary weight. Conversely, I and other writers1 2 have given the work less weight. This reflects only a difference of opinion, not a misinterpretation of facts.

More interestingly, Schachter and colleagues label my gibe at the Black Lung Law, failing to recognize it as the chief source of constant amusement that proponents of a Brown Lung Law, casting its sooty pall over all better efforts to find solutions to problems of workers' compensation. This may not be entirely bad, because disease-specific compensation laws are urged upon us under two assumptions, both dubious. The first is that workers in a particular industry, when they fall ill, are especially deserving of compensation, in comparison to sick workers in less favored industries. The second is that the villainous employer who caused the illness can be made to bear the entire financial burden resulting from his mischief. The Black Lung Law is a standing refutation of the latter, raising energy costs that all must bear, and siphoning billions more from tax revenues. It is also a massive proof of how quickly and completely the medical bases for diagnosis and assessment of an occupational illness can be abandoned, in favor of the legislative ukase and the administrative fiat. It is therefore a source of constant amusement that proponents of a Brown Lung Law speak highly of the Black Lung Law, failing to recognize it as the chief obstacle to the realization of their own wishes.

Robert N. Jones, M.D., F.C.C.P.
Professor of Medicine,
Tulane University School of Medicine,
Pulmonary Diseases Section,
New Orleans