

Significance of finger clubbing in asbestosis

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ABSTRACT The prognostic significance of finger clubbing in asbestosis has been assessed in 167 cases certified by the London Pneumoconiosis Medical Panel from 1968 to 1974. Finger clubbing developed early in the clinical course of the disease and was associated with a lower gas transfer, a higher mortality and a greater likelihood of progression in intrapulmonary fibrosis than was found among cases without finger clubbing. Finger clubbing was not associated with heavier asbestos exposure. Its presence appears to be associated with a more severe form of disease.

Finger clubbing in association with asbestosis was first noted by Wood in 1929¹ and has been reported with varying frequency in all series since. Smither² reviewed four series of cases of asbestosis from the same factory spanning 35 years and found the prevalence of finger clubbing varied from 20% to 84%. Parkes³ states that it is present in about half of patients with more advanced asbestosis and less often in those with mild disease.

Some workers^{4,5} have shown an increasing prevalence of finger clubbing with increasing asbestos exposure in groups of heavily exposed insulation workers but it is not clear whether this is an independent effect of asbestos exposure or an association with asbestosis. Wallace and Langlands⁶ in a case-control study of 50 insulation workers found that the hyponychial angles of the ladders were significantly greater than those of controls. Again it is not possible to determine from the data whether this was the result of asbestos exposure or an association with asbestosis, but 14 of the workers had radiographic evidence of asbestosis and six had evidence of possible asbestosis. Finger clubbing seems most likely to be a consequence of asbestosis and not simply asbestos exposure.

Regan *et al*⁷ compared the subjective assessment of finger clubbing made by 13 chest physicians with objective measurements made in 50 asbestos workers. They suggested that the hyponychial angle might be used as a continuous variable for correlation with other indices of abnormality. A gradient of increasing radiographic and physiological abnormality was shown to accompany normal fingers, doubtfully nor-

mal fingers, doubtful clubbing, and clubbing; but the major differences lay between the cases of clubbing and the rest.

Patients and methods

From 1968 to the end of 1974, 167 cases of asbestosis certified by the London Pneumoconiosis Medical Panel were seen at the Brompton Hospital. The guidelines⁸ for the diagnosis of asbestosis in use at the time state that, given exposure to asbestos, two of the features breathlessness, finger clubbing, basal rales, radiological changes, and reduced gas transfer would strongly suggest asbestosis. Most of the analyses reported here relate to the 155 men with asbestosis. Information collected from these cases has been used to investigate the significance of finger clubbing in asbestosis.

A clinical questionnaire that included an asbestos exposure history was completed for all cases. Physical examination was performed and finger clubbing recorded as present or absent; doubtful clubbing was regarded as absent. Most patients were seen at first attendance by MTW and at follow up by IIC. Interobserver and intraobserver variation were not assessed but the analyses presented are mainly dependent on one observer (MTW). FEV₁ and vital capacity (VC) were measured with a low inertia spirometer and transfer factor (TLCO) was measured with a Resparameter Mark III. The tests were carried out with the subject seated and wearing a nose clip. A full size posteroanterior chest radiograph was available for all cases and the films were classified independently by three readers using the 1971 ILO-U/C classification of the radiographs of pneumoconiosis.⁹ Interobserver and intraobserver variation was small

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and the median profusion score for small opacities has been used in analysis.

The cases were followed up 4–11 years (mean 7.5 years) after certification and the same data were collected again. Sixty six patients had died and a radiographic follow up was obtained for 98 of the 101 survivors. Progression of asbestosis was determined radiographically in the survivors by comparison of paired films in known order.

Results

There was finger clubbing at presentation in 72 of the 167 cases (43%). Table 1 shows the proportion of male cases with finger clubbing in each radiographic category. There was a significant linear correlation ($r = 0.36$, $p < 0.01$) between profusion score on the 12 point ILO-U/C scale and the proportion of cases with clubbing of the fingers.

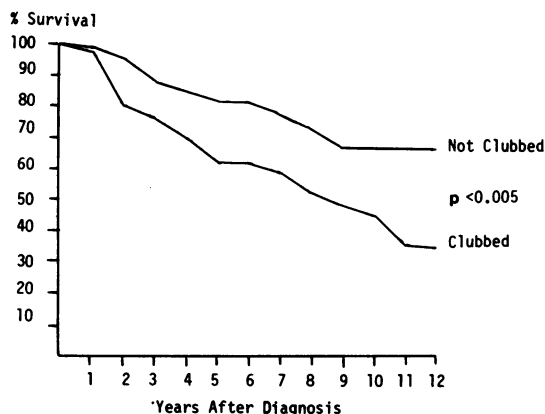
Table 1 Relationship between radiographic category and finger clubbing: male cases

Radiographic category	0	1	2	3
No with finger clubbing	9	34	19	5
Total No	36	84	30	5
% with clubbing	25	40.5	63.3	100

Table 2 Age, duration of exposure, and time from first exposure at diagnosis in 155 men with asbestosis

	Age Mean (range)	Duration of exposure Mean (range)	Time from first exposure Mean (range)
Clubbing (n = 67)	55.4 (40–73)	18.1 (1–46)	27.2 (9–54)
No clubbing (n = 88)	54.7 (32–75)	22.8 (2–48)	30.1 (10–50)
p	NS*	0.02*	NS*

*Mann-Whitney U test.



Survival after certification in men with asbestosis with and without finger clubbing.

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Table 2 compares the age and exposure characteristics of men with and without clubbing. The two groups are comparable in age and time from first exposure to asbestos, but the group with finger clubbing had a significantly shorter duration of exposure to asbestos and there was a weak negative correlation between finger clubbing and duration of exposure ($r = -0.22$, $p < 0.05$).

The values for percentage of predicted FEV₁ and VC were not significantly different in the cases with (69.4 (18.1) and 68.7 (16.4)) and without finger clubbing (69.3 (18.1) and 72.4 (17.2)); but TLCO was considerably lower in the cases with finger clubbing (54.5 (SD 18.4) v 63.2 (18.8); $p < 0.01$, Mann-Whitney U test).

The figure shows a comparison of the mortality among the male cases with and without clubbing. Sixty one male deaths are included in this analysis and mortality has been compared by means of the log rank test. The cases with finger clubbing show an increased mortality rate that persists throughout the period of observation ($p < 0.005$).

Thirty three deaths occurred among men with finger clubbing at certification. In 17 the death certificate gave lung cancer as the cause of death and in a further case the panel detected a bronchial carcinoma when they examined the lungs of a man dying from another cause. The death certificate recorded lung cancer in six of the 26 deaths in cases without finger clubbing, but two further cases were found when the panel examined the lungs. Although lung cancer was found more commonly in cases with finger clubbing the difference was not significant.

The difference in mortality between the cases with and without finger clubbing continues to widen throughout the period of follow up and it seems unlikely that the difference can be accounted for by an association between finger clubbing and occult lung cancer at presentation.

Table 3 examines the relationship between finger clubbing at presentation and subsequent radiographic progression of intrapulmonary fibrosis. Progression occurred more frequently ($p < 0.01$) in those with finger clubbing—in 54% of the cases with finger clubbing but only 21% of those without it.

There were only four cases in which finger clubbing appeared to have developed after the initial

Table 3 Relationship between progression of profusion score and finger clubbing*

	Finger clubbing	No finger clubbing	Total
Progressors	20	17	37
Non-progressors	13	48	61
Total	33	65	98

* χ^2 9.63, $p < 0.01$.

presentation. All four cases had category 0 profusion scores at presentation. Two of these cases progressed possibly they had been diagnosed early in the disease before finger clubbing had had time to develop.

Discussion

Patients with asbestosis certified by the pneumoconiosis medical panels are a selected but nonetheless well defined group who have good reason to be concerned about their future health, and clinical features that help to predict outcome may be of value both in counselling and in assessing compensation.

Finger clubbing was present in 42% of cases at the time of certification. Once present it persisted and few people developed finger clubbing after certification. It therefore seems to be a sign that develops early in the disease. Wyers,¹⁰ who was able to watch the disease evolve in his studies in an East London factory, also found that finger clubbing developed early in the disease if at all.

The exposure data in this study were crude but there was no evidence that finger clubbing developed in cases with the heaviest exposures. On the contrary, it arose in those whose exposure appears to have been less heavy. Despite this, finger clubbing was associated with a higher mortality and progression was more likely. In the cases with clubbing gas transfer was significantly lower than in those without clubbing, an effect that has been noted previously,¹¹ but FEV₁ and FVC were similar in the two groups. The greater the radiographic evidence of fibrosis the greater was the likelihood of finger clubbing. These data strongly suggest that finger clubbing identifies a subgroup of cases of asbestosis with a higher mortality rate and an increased risk of progression. Unfortunately the sign develops at a time when it is of no help in preventing the consequences that it heralds.

The cause of finger clubbing in asbestosis, as in the other conditions in which it occurs, is unknown. Its prognostic significance has received little attention, but Kitis *et al*¹² measured finger clubbing objectively in cases of ulcerative colitis and Crohn's disease and found it to correlate with both disease activity, assessed by changes in haemoglobin, serum albumin,

and seromucoid concentrations, and the extent of fibrosis in resected specimens. These findings and our own suggest that in at least three disorders individuals with finger clubbing suffer from a more severe disease than those without clubbing.

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