TUBERCULOSIS AS A NECROPSY ROOM HAZARD*

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Evidence in the Literature

The literature suggests that there are grounds for suspecting that the necropsy room might be a centre for the dissemination of tuberculosis. Hedvall (1940) discussed the incidence of tuberculosis among students at Lund University, and found that it was significantly greater among medical students than among those of other faculties, and that a high proportion of the cases appeared to coincide with the course in general pathology. Bacteriological examination of the post-mortem rooms showed that tubercle bacilli (verified by culture and animal inoculation) were present on towels and trays and in the dust on necropsy tables for 24 hours after a necropsy on a case of tuberculosis, in spite of the usual precautions as regards cleanliness. No fresh cases occurred after stringent precautions were taken and the examination of tuberculous cases was limited.

Sloan (1942), in America, devised an experiment to see if tubercle bacilli were disseminated from fresh necropsy material. A glass plate was suspended 8 in. above tuberculous lungs which were being cut with scissors and pressed. The plate was washed after being in position for 15 minutes, and after direct smears had been made the washings were centrifuged and cultured, but not inoculated. In eight out of 10 experiments tubercle bacilli were grown, and Sloan concluded (1) that methods of examination using the compression technique contaminate the atmosphere in the vicinity of the necropsy, and (2) that fresh tuberculous lungs are distinctly dangerous and a potent source of atmospheric contamination against which proper protection should be used.

Morris (1946) described conditions in the Women's Medical College of Pennsylvania. Working from patch test conversion rates, she

concluded that the most rapid increase in these conversions arose from laboratory and necropsy work. She stated that the disease occurred earlier and progressed more rapidly in women than in men, and that the necropsy room was one of the chief sources of danger. Since the institution of a new and strict regime for the conduct of necropsies, no cases of active tuberculosis had occurred.

An annotation in the *British Medical Journal* (1949) pointed out that the risk was not so easy to assess in this country as in Sweden and America, where necropsy and clinical work are separated, and that, although the figures from these two countries did not constitute proof, they were definite pointers.

The people studied in these surveys were medical students, but if they run a risk there might be an even greater hazard to pathologists and post-mortem attendants, who spend much more time in the necropsy room, though in general they are of a less susceptible age group. Post-mortem attendants especially might be exposed to special risks, as many of them do not understand the elementary rules of hygiene, let alone problems of bacterial contamination.

The A.C.P. Inquiry

The Committee on Histopathology considered that detailed data involving a considerable amount of work on all concerned would be necessary in order to give an answer, and it was therefore decided to send a preliminary questionnaire to all members of the Association in charge of departments asking for their personal observations on the occurrence of tuberculosis among medical or other staff engaged in post-mortem work. If a *prima facie* case existed a more elaborate and detailed study would be warranted.

The questionnaire was in the following form :

- (1) Name of department.
- (2) Number of necropsies per year.
- (3) What proportion of these necropsies

* A discussion on this subject was held at the meeting of the Association of Clinical Pathologists in January, 1950. It was then decided to refer the question for examination by the Committee on Histopathology, and the results of the investigation form the material for this paper.

showed active tuberculosis? (4) The number of years for which the pathologist could give figures. (5) The incidence of cases of active tuberculosis in the necropsy room staff of the pathologist's present department divided into (a) medical staff and (b) technical staff (including porters, attendants, etc.).

Completed questionnaires were received from 107 departments, and the first analysis of the figures was as shown in Table I.

TABLE I
RESULTS OF QUESTIONNAIRE

Number of Departments	Approximate Total No. of Necropsies	No. of Necropsies Showing Active Tuberculosis	Incidence of Tuberculosis in Necropsy Room Staff	
			Medical	Technical
107	192,064	8,910	12	14

A letter asking for further details, and, if possible, an expression of opinion on the probable source of infection, was sent to each pathologist making a "positive" return. This correspondence turned out to be very important, and clearly showed how difficult it is to determine the probable source of infection. In several instances it appeared that the infected person had been in close contact with a case of open tuberculosis outside the necropsy room, and in one department three medical men were affected before the open infection in a cleaner was discovered, and no further cases occurred after her removal. Quite often the medical men and the technical staff (including porters) had duties which took them into contact with tuberculous patients in the hospital or with tuberculous material in the laboratory, quite apart from the general risks run by all members of the community. Two medical men had recurrences of old tuberculous infections while doing some necropsy work, but they might well have had these in any case. How is it possible to assess the source of infection in a girl, aged 19, who developed a tuberculous knee after working for six months in a part of the post-mortem room, owing to lack of space in the laboratory, spending quite a lot of her time examining tuberculous cerebrospinal fluids, and taking no part in the necropsy work? It is significant that pathologists with the largest experience of big departments have tended to record the lowest incidence of tuberculous infection among their staffs, most of them sending a negative return.

Taking into account the details received and the views of the pathologists concerned, it is possible to remove from the totals given in the first analysis

10 of the medical men and six of the technicians, so that the result might read as shown in Table II.

This leaves two doctors and eight technicians who might have acquired tuberculosis in the necropsy room, and the evidence in some of these cases leaves the matter very open. These "positive" figures are not large, considering the extent of the survey, and of themselves do not seem to constitute a *prima facie* case for considering the necropsy room as a serious source of tuberculous infection for the staff working in it. It might be argued that the removal of names from the list on account of detailed information is not justified when assessing an occupational risk, but in this particular inquiry it was felt that the original figures would give an altogether exaggerated assessment of the hazard. Medical students have not been considered in this investigation.

TABLE II

Number of Departments	Approximate Total No. of Necropsies	No. of Necropsies Showing Active Tuberculosis	Incidence of Tuberculosis in Necropsy Room Staff	
			Medical	Technical
107	192,064	8,910	2	8

It was thought that any attempt to estimate the number of people at risk would give results of doubtful value, but it was undertaken as a follow-up to the original questionnaire. Seventy-nine replies were received, and these gave totals of 392 doctors and 268 technicians, 660 people in all, who had been engaged for periods varying from a few months to 20 years in the necropsy room, but in most cases it was found that pathologists were unable to give precise details of the exposure of each individual. Out of these 660 people, eight developed tuberculosis, and have been included in the 10 "positive" results given in Table II. The Mass Miniature Radiography Survey of Civilians (Clark, D'Arcy Hart, Kerley, and Thompson, 1945) gave the incidence of newly discovered significant tuberculous lung lesions as 10 to 15 per 1,000, and, of these, 3 or 4 per 1,000 required institutional treatment: the results obtained in the present inquiry, although estimated on a different basis and of doubtful value statistically, are not higher than these when the period covered is considered.

A limited inquiry of this type leaves many questions unanswered. Several correspondents expressed the view that the laboratory was likely to be a much more potent source of infection than the necropsy room, and that any full investigation should cover all laboratory workers. This may

well be true, but such an extended survey was outside the scope of the present preliminary work.

Some risk of infection to people handling material from active tuberculous cases there must be, and, even if the figures given here do not make it seem very considerable, adequate precautions should be taken. The most important precautions which should be taken are to fix tuberculous lungs in formalin before opening them, and to avoid scraping the cut surfaces in the fresh state.

Summary

An inquiry has been made from pathologists in charge of departments as to the incidence of tuberculosis among staff workers in the necropsy room.

From 107 departments covering approximately 192,000 necropsies (including about 9,000 showing

active tuberculosis) two doctors and eight technical staff developed tuberculosis under circumstances which make the necropsy room at least a possible source of infection.

These figures do not seem to constitute a strong *prima facie* case for regarding the necropsy room as a serious source of tuberculous infection to the staff working in it.

The Committee on Histopathology of the Association of Clinical Pathologists would like to thank all members of the Association who kindly supplied data for this inquiry.

REFERENCES

- Brit. med. J.* (1949). 1, 907.
 Clark, K. C., Hart, P. D'Arcy, Kerley, P., and Thompson, B. C. (1945). *Spec. Rep. Ser. med. Res. Coun. Lond.*, No. 251.
 Hedvall, E. (1940). *Amer. Rev. Tuberc.*, 41, 770.
 Morris, S. I. (1946). *Ibid.*, 54, 141.
 Sloan, R. A. (1942). *N.Y. St. J. Med.*, 42, 133.