

11. Pathology

Key findings

- 16% of the patients who died in this study had an autopsy. Of these 77% were authorised by a coroner and only 18% were the result of a clinician request.
- Of the received autopsy reports, 50% were judged to be satisfactory or better.
- 34% of reports had no clinico-pathological summary and in 24%, where it was presented, it was judged to be unsatisfactory.
- The causes of death were erroneously structured according to the ONS pattern of formulation in 26% of cases and in a similar number of cases the causes of death were judged not to reflect the clinico-pathological circumstances.

Introduction

Of the 560 patients in this study population who died, 16% (91/560) had an autopsy. Autopsy reports were received from 48% (44/91) of these cases. Since there are only 44 reports to consider, analysis and comment are necessarily limited. The observations on quality are based on standards indicated in the Royal College of Pathologists *Guidelines for Autopsy Practice*⁴² which are intended to apply to both consented and coronial autopsies.

Most of the observations on autopsy quality are similar to those in previous NCEPOD reports. For coronial autopsies, there is the issue over the difference in expectations of what information an autopsy is intended to provide, between clinicians and the coroner. Under the Coroners Act 1988, coroners are only required to determine how the person came by their death, i.e. what is the cause of death. Clinicians would like to know more about the underlying disease, its complications and the impacts of treatment in order to audit the care of their patients. Another point made in the last report⁴³, that the formulations of causes of death could be significantly improved, pertains again in the current data set.

Autopsy rate

18% (8/44) of the autopsies followed clinicians' interest and consent from relatives, but the majority (80%, 35/44) were performed on instruction from a coroner. The remaining one was unable to be classified. The overall proportion of autopsies among the patients dying on ICUs (16%) is less than the current national average of 23% of all deaths⁴⁴. Whilst patients on ICUs are perhaps more likely to have known underlying pathology compared with many deaths in the community, the experience of this patient data set as well as published and personal experience indicate that the autopsy on ICU patients presents many surprises⁴⁵. The revealed clinical pathology and comparison with the presumed pathology is often useful in formulating policy changes in ICU management. More consented autopsies should be sought from this important patient population.

Age of cases

The median age of the patients autopsied was 65 years (range 16-84).

Clinical history

A clinical history was incorporated into the autopsy report in 84% (37/44) of cases, and qualitatively was satisfactory or better in 81% (30/37) of those. The unsatisfactory reports failed to indicate the clinical questions being addressed, confused the dates of events, omitted mention of MRSA, or were so short as to be unhelpful, for example "This man was admitted with breathlessness".

External descriptions of the cadaver

Only 7% (3/44) were unsatisfactory, usually being too telegraphically short. Since the patients came from ICU and all had lines inserted at some stage during admission, one expects that the lines and other devices should have been left in the body pending the autopsy and that all descriptions would include mention of such lines instead of in only 73% (32/44) of reports.

Body measurements

It is recommended that body height and weight be recorded for all autopsied patients⁴². In this study, 73% (32/44) had their height recorded and 64% (28/44) were weighed. Anecdotally we know that budgetary constraints often inhibit provision in public mortuaries of equipment such as body scales.

Full or limited autopsy

Full autopsies were conducted in all but seven cases, where the head was not opened for examination of the brain. The reasons given for this were, in one case, specific non-consent from relatives for opening the skull. In five other coronial cases where the clinical history was presented, the pre-mortem clinical data indicated no issue of possible significant brain clinical pathology. This is now regarded as reasonable, as long as it can be justified that little or no pathological purpose may be served by opening the head and rendering the cadaver less presentable to relatives⁴². Interestingly, in one case where the head was not opened, the pituitary was stated to be normal: presumably this reflects over-reliance on a standard autopsy proforma.

Cerebral pathology

In the other 37 autopsies, the brain was examined and found to be abnormal in ten cases; nearly one third. These included intracerebral haemorrhage, stroke, hypoxic encephalopathy, or metastatic tumours to the brain. Review of the available clinical histories indicates that in most cases these conditions were already known or suspected, the autopsy providing useful confirmation. In only two cases did brain examination bring out previously unknown pathology, but neither were severe: a 1.5cm choroid cyst, and a small old cerebral infarction. However, in the majority of the 'normal brains' no histology was performed.

Hypoxic encephalopathy

An issue that has not been addressed nationally in pathology circles is the need to perform histology on the brains of patients who have been clinically declared to be 'brain dead'. 8% (3/37) of the autopsied patients examined were so categorised in this study, and none had confirmatory histology. The gross appearances of the brain in early hypoxic encephalopathy are non-specific and then the morphological diagnosis can only be confirmed microscopically. In life, the diagnosis of brain death follows strict clinical and imaging criteria, and for medico-legal purposes it is not a requirement to have autopsy confirmation.

Description of internal organs

The great majority of the descriptions were judged satisfactory or better, and only 3/44 were unsatisfactory. The reasons given were extreme brevity, for example, no mention of the coronary arteries in an ischaemic heart death case, and the fact that in a patient with presumed post fracture local sepsis, the site of the fracture was not examined for evidence of infection; normally the fracture site is not examined internally unless there are questions over the pathology underlying the fracture, or its treatment.

Histopathology sampling

Interestingly, in the majority of cases, 55% (24/44), histology was taken. This is more than the proportions of 36%, 28% and 27% in previous reports^{22,43,46}, a reflection, perhaps, of the complexity of ICU-derived death autopsies. From the advisors' and general experience, many ICU deaths result from multi-organ failure, which can be very non-specific on gross appearances and requires further investigations for analysis. In this study, three categories of clinical pathology should also, in our opinion, have been investigated histopathologically. These were cirrhosis (three cases), presumed cancer (two cases), and heart valve vegetations (two cases).

It is important to note that histopathology is not routine in coronial autopsy work, being required, and thus permitted, by a coroner when a cause of death may not otherwise be provided from gross examination. There are cost implications for autopsy histopathology, since it is expected to be charged to the coroner by the pathologist or his department. Further, there are resource implications for the coroners' officers in their obligations to involve relatives in informing about retaining tissue samples or organs. However, once the coroner's requirement on cause of death is satisfied, and he is 'functus officio', the pathologist may legitimately approach the relatives to discuss further, consented, tissue sampling in order to refine the clinical pathology.

Clinico-pathological correlation

The Royal College of Pathologists⁴² and NCEPOD increasingly have commented on the importance of the summary clinico-pathological correlation in an autopsy report. This enables a synoptic overview of the case, the diagnosis, the factors that lead to death, and resolution (if possible) of the issues raised by the death. In this sample 34% (15/44), had no such correlation in the report. In 24% (7/29) of cases where it was presented, it was judged unsatisfactory. Again, discussion and proper evaluation of the type of malignancy or of the significance of valvular vegetations were the most frequent basis for this assessment.

Office of National Statistics (ONS) cause of death

In the previous NCEPOD report⁴³, inadequacies in the formulation of the cause of death were highlighted. Pathologists, from their experience, should do this better than most clinicians. But in the available sample of 42 causes of death, 26% (11/42) were defective in the actual structure of the cause of death according to the standard rules, and in a similar proportion the quoted causes of death were judged not congruent with the pathological details in the actual autopsy report.

The following are typical of the problems found:

A. Patient who died following paracetamol overdose.

The stated cause of death was:

- 1a. bronchopneumonia
- 1b. intracerebral haemorrhage
- 1c. hypertension
2. obesity, enlarged fatty liver.

Better would have been:

- 1a. bronchopneumonia
- 1b. liver failure
- 1c. paracetamol toxicity
2. hypertension, intracerebral haemorrhage.

B. Patient who died of lung cancer with septic complications. The stated cause of death was:

- 1a. multifactorial
- 1b. hepatorenal failure
- 1c. pyelonephritis
2. primary lung carcinoma.

Better would have been to place lung carcinoma in the lowest line of part 1 of the cause of death sequence:

- 1a. multi-organ failure
- 1b. sepsis
- 1c. carcinoma of lung.

The Office of National Statistics(ONS) derives data for the main causes of death from the bottom line of Part 1 in the medical certificate of cause of death. The above cases illustrate how even autopsy diagnoses are not being accurately incorporated into national statistics on cause of death because of incorrect certification.

Cirrhosis

9% (4/44) of autopsied ICU patients had cirrhosis, three of these apparently unsuspected pre-mortem. Histological evaluation was only done in one case. The autopsy diagnosis of cirrhosis, particularly early cirrhosis, is not always straightforward with regard to confirmation or exclusion and histology also may indicate a cause for cirrhosis. Therefore more histological sampling would be useful. Undiscovered cirrhosis in a hospitalised patient population is an unquantified and complex problem. There is no simple non-invasive test that detects cirrhosis reliably, yet the presence of cirrhosis has significant impact on morbidity and mortality following major operations and in multi-organ disease as encountered in ICU patients⁴⁷.

MRSA infection

From the clinical data, 2/44 of the autopsied patients had known MRSA infection at time of death. In neither of the autopsy reports was this mentioned anywhere. In one case, the cause of death was “chronic lung disease with lung abscess (unspecified)”. Given the current concern about hospital-acquired infection rates and morbidity, and MRSA in particular, pathologists should be beholden to present a considered assessment of the attributable contribution of MRSA to the sequence of events leading to death. The evidence is important for reasons of public health.

Overall scores

These autopsy reports have been assessed against the Royal College of Pathologists guidelines⁴². 80% of the autopsies appeared to have been performed and documented satisfactorily or better, but only 50% were overall scored so, mainly because of the lack of clinico-pathological summary, lack of histology, and poor formulation of cause of death.

Concerning clinical relevance of the autopsy, in only one case did the autopsy reveal an unsuspected clinical pathology that might have altered management if known: the patient was presumed to have malignancy, but in fact had ischaemic heart disease.

Mortality and morbidity meetings

In the previous chapter it is noted that pathologists comprise only 1% (2/202) of the health professionals attending mortality and morbidity meetings. Whilst the majority of ICU deaths are not autopsied (84%), and therefore the pathologist's presence may not be of assistance, this low figure suggests that they are not invited to the meetings, or that they cannot attend for reasons of timing. The advisors' experience of such meetings is that they stimulate discussion of remediable factors and the pathologist's contribution is valued.

The purpose of autopsies

Review of the autopsy reports raises the question of the differing expectations of the coronial autopsy in complex medical cases, and whether the results of autopsies are expected, or not, to contribute to clinical governance and audit. As discussed in the section on histopathological sampling above, more investigation can be done once the needs of the coroner are satisfied, with consent from relatives.

In the recent Shipman reports⁴⁸ and proposals for reform of the 'coronial system'⁴⁹, it is indicated that information from all autopsies should be used more in medical audit. For this to be useful, the quality of autopsy reports needs to be of a more uniform standard. It is hoped that more harmonisation and standardisation may develop if and when the reforms to the coroner's and death certification systems in England and Wales are implemented⁴⁹.

Finally, NCEPOD will be undertaking a survey of the quality of all autopsy reports in England, Wales, Northern Ireland and Guernsey, from a representative selection of examinations of deaths in the community as well as in hospital. The results will provide a better baseline of performance data to enable more focussed critical review of future autopsy activity.

Recommendations

- More care should be given to the formulation of the cause of death for presentation to the coroner and transfer into the medical certificate of cause of death.
- On this group of patients, consented autopsies should be sought more often to evaluate complex clinical pathology.
- In coronial autopsies on ICU patients, increased histopathological sampling should be undertaken to improve disease identification, with the consent of relatives, once the coroner's requirement is satisfied.
- Pathologists should become more involved in the mortality meetings on ICU patients.