

Accuracy of Clinical Diagnosis in a Teaching Hospital : a Study of 100 Consecutive Medical Autopsies

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Abstract

With the current emphasis on cost effectiveness and quality assurance in health care, autopsy results can help evaluate the antemortem diagnosis and medical treatments or interventions that the patient receives, and whether or not those interventions were appropriate. The aims of this study were to audit autopsies of deaths within 48 hours and deaths after 48 hours of hospital admission by comparing antemortem and postmortem diagnosis. The study sample comprised 100 consecutive autopsies. In 17% autopsies, major discrepancies were noted between antemortem and postmortem diagnosis. Patients who died within 48 hours of admission had a statistically significant higher chance of having a major discrepancy between antemortem and postmortem diagnosis. Minor discrepancies were seen in 18 cases. In 14% cases, gross autopsy findings did not match histopathological diagnosis.

Introduction

Autopsy has been called "the ultimate medical consultation". Autopsies are absolutely necessary for the progress of modern clinical medicine and for solving many problems : diagnostic, control of treatment quality, detection of infections, hereditary and systemic diseases, establishing causes and mechanisms of sudden death, qualification of unclear diseases and syndromes, classification and nomenclature of nosological entities. The role of autopsy in teaching and training, postgraduate education cannot be emphasized enough.¹

In this study, we examine the discrepancies between antemortem and postmortem diagnosis, discuss the correlation between gross and histopathological findings and attempt to evaluate the factors responsible for the

declining rates of autopsy.

Material and Methods

This is a prospective study and analysis of 100 consecutive medical autopsies of patients over a period of 12 months. During this period, there were a total of 1558 deaths. A total of 112 medical autopsies were performed of which the first hundred were included in this study. Of the 100 deaths studied, 26 occurred within 48 hours of admission to the hospital while the rest (n=74) occurred after 48 hours. Clinical impression was documented in 86 cases. Autopsies were performed by residents and lecturers under supervision of professor in charge of autopsy. Information regarding age, sex, duration of hospital stay, clinical presentation, antemortem investigation results, clinical diagnosis/differential diagnosis, postmortem gross findings, provisional cause of death and final cause of death after histopathological tissue examination was recorded in a proforma

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and analyzed. Major and minor discrepancies between antemortem and postmortem diagnosis were analyzed. A major discrepancy was defined as discrepant primary diagnosis with an adverse impact on survival. A minor discrepancy was defined as a discrepant secondary diagnosis not directly related to the cause of death. This also includes occult or accidental findings and findings related to senile changes or supporting main cause of death.

Observations and results

The 100 autopsies were classified into two groups:

Group I : 83 autopsies where the clinical impression matched the final cause of death on histopathological examination. Minor discrepancies were noted in 18 of these cases.

Group II : 17 autopsies where the clinical impression did not match the final cause of death and major discrepancies were present between antemortem and postmortem.

Each group was again analyzed for deaths within 48 hours of admission and deaths after 48 hours of admission.

In group I death occurred in 12 cases (14%) within 48 hours of admission while in group II death occurred in 10 cases (59%) within 48 hours of admission. Patients who died within 48 hours of admission had statistically significant higher chance of having a major discrepancy between antemortem and postmortem diagnosis ($p < 0.00005$, Odds ratio 0.12 with confidence interval 0.03 to 0.42).

Gross autopsy findings did not match final histopathological diagnosis in 14% cases. 9 of these cases were from group I (11%) while 5 belonged to group II (29%).

The final cause of death was given after complete histopathologic examination of various tissues. Table 1 gives a list of major discrepancies between antemortem and final (postmortem) diagnosis. The largest

Table 1 : Major discrepancies between antemortem and postmortem diagnosis.

No. of Cases	Final cause of death
7	Pulmonary or disseminated tuberculosis
2	Cerebral malaria Malignancy
2	Malignancy
2	Acute myocardial infarction
2	Submassive hepatic necrosis
1	Pseudomembranous enterocolitis
1	Acute haemorrhagic pancreatitis

single category of unsuspected diagnoses was undiagnosed infections like tuberculosis and malaria followed by acute myocardial infarction and malignancy.

Discussion

As early as 1912, Cabot recognized the value of autopsy in detecting common errors in clinical diagnosis. Several more recent studies have confirmed its merit in modern medical practice.^{2,3,4} All have shown that despite many advances in diagnostic techniques a significant number of diagnoses are either not confirmed at or not suspected until autopsy. The overall figure of 35% for discrepant diagnosis (major 17 and minor 18) is comparable to the figures quoted in the literature which range from 7% to 39.7%. Problems the clinicians have not recognized, false positive and negative still occur frequently.

Infectious diseases like tuberculosis and malaria continue to be the commonest diseases that remain undiagnosed and were found to be the most important major discrepancy between antemortem and postmortem diagnosis. This is clearly in

contrast to studies reported from the western world where pulmonary embolism and malignancies remain the major cause of discrepancies in antemortem and postmortem diagnosis.⁵

Hospital stay of less than 48 hours before death was more common in group II (i.e patients who were found to have major discrepancies in antemortem and postmortem diagnosis), suggesting that the clinicians are now relying more on diagnostic tests to arrive at a diagnosis. A shorter hospital stay might not enable the treating clinicians to utilize all diagnostic modalities available (especially in public health care set up).

Possible factors contributing to diagnostic errors are lack of adequate history, errors of omission (failure to obtain admission screening test, failure to carry out required, indicated procedures), errors of judgement (failure to account for signs/symptoms noted, failure to account for abnormal investigation report, prejudiced viewpoint.), misleading investigation reports and failure to review a case as a whole or to repeat physical examination.

It may not have been possible to avoid the diagnostic errors in the cases with short hospital stay, but in those with a long hospital stay, treatment and outcome would have been different if they could have been diagnosed antemortem. As long as diagnosis and therapy continues to evolve discrepancies will continue to exist at a substantial level. Thus it is beyond doubt that autopsies still continue to reveal a considerable number of errors in clinical diagnosis in patients dying in the hospitals. There is no convincing sign that there is decrease in the rate of errors although the diseases and types of mistakes have changed.

The controlling function of autopsy acts at two levels viz. a) at the individual level, the autopsy helps the clinician to understand the signs and symptoms in the actual case. b) at the collective level, analysis of a large number of autopsies can expose errors in the clinical diagnostic process and initiate correction of these errors.

Gross autopsy findings can occasionally prove inadequate and histopathological examination of involved tissues is recommended. Sections from organs that appear grossly normal and would not contribute to the diagnosis usually do not need to be examined histopathologically.

Lack of documentation of clinical impression in 14 cases probably reflects the lack of concern or fear of litigation or both. Clinicians should be sensitized that the information that they provide is vital to the pathologist.

Medical autopsies are progressively declining worldwide.^{6,7} Some of the reasons are discussed below :

- a) Clinicians lack motivation and feel autopsies are unnecessary. The clinicians are more confident of their diagnosis of the underlying cause of death and with the increased confidence come a lack of interest in autopsy.
- b) Difficulty in obtaining the consent for autopsy from patient's relatives. This often stems from lack of good communication between the treating clinicians and patient's relatives.
- c) In some cases it is the fear in the treating doctors that the autopsy findings may not be consistent with the presumed clinical diagnosis. This, the clinicians may

fear, might expose their mistakes in diagnosis and or treatment.

- d) There is an increasing dependence and over reliance of the clinicians on sophisticated modern diagnostic modalities. This has resulted in making the autopsy superfluous. Several studies have shown that despite the improved quality of diagnostic technology the frequency of incorrect diagnosis has not decreased appreciably.⁸
- e) A long turnaround time for final histopathologic autopsy reports reduces the clinician's interest in the process. Hence autopsy reports should be given in a time bound manner i.e. provisional reports should be issued the same day and final reports within a month of autopsy.
- f) All autopsy examinations should be carried under the supervision of a senior pathologist; this will help in accurate interpretation and diagnosis of gross examination findings.
- g) The entire process should involve all concerned parties closely i.e. the clinicians involved in patients care, patient's relatives and the pathologists.
- h) With the easy availability of digital photography, a compact disc containing gross and microscopic pictures can be provided to the clinicians. There should be bimonthly meetings of clinicians and pathologists to discuss the cases.

If no autopsies were performed, what would be missed and what would be gained? We would gain a little space in the

hospital mortuary / postmortem room. We would gain variable amounts of file and storage space and histotechnician time. The incidence of occupational hazard for pathologists and mortuary workers might come down. We would save a few autopsy calls, but have fewer opportunities to know what is going on in the hospital and in the community.

To conclude, autopsy still remains the "gold standard" of final diagnosis. Infectious diseases continue to be under diagnosed and are the most common cause of discrepancy between antemortem and postmortem diagnosis. The declining rate of medical autopsies is a cause of concern and needs urgent attention especially by clinician's and pathologists in teaching institutes.

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