

Commentary

Autopsy in critical illness: is it obsolete?

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Abstract

The autopsy continues to have important implications for patient management in critical illness. It is not obsolete. Autopsy data help us to track shifts in disease prevalence over time and to heighten surveillance for serious diagnoses that are commonly missed. These data help us to identify important contributors to death that may be remediated through quality assurance and control programs. In discrete patient subsets, information from autopsies may reinforce the degree of certainty surrounding end-of-life decision-making.

Keywords autopsy, critical illness

In the present issue of *Critical Care*, Perkins and colleagues revisit the role of autopsy in critically ill patients [1]. These authors evaluated 38 of 49 available autopsy reports in a population of 636 patients (6%). They found that premortem and postmortem findings were in complete agreement in less than one-half of these cases and that major missed diagnoses that might impact on treatment and outcome were present in 39% of the cases reviewed. The most frequently missed diagnoses included myocardial infarction, carcinoma and pulmonary embolism.

Autopsy series continue to appear in the medical literature and they continue to have an important clinical impact. The present commentary will outline the limitations and contributions of autopsy data. It will include a brief discussion of selection bias in autopsy studies, the important role autopsy plays in tracking disease prevalence over time, its characterization of newly emerging diseases, its contribution to education and quality control programs, and its role in clinical decision-making.

Limitations of autopsy data

Autopsy studies are case series and they usually represent a small proportion of the total number of patient deaths recorded in the study period. Most often, the reader is not given the total number of patient deaths, so the proportion of patients undergoing autopsy and how representative that study sample might be is never known. The Perkins and

colleagues' study, however, gives the reader very complete information [1]. They indicate that 7.7% of their deaths had postmortem examinations and that their study sample represented 6% of the total deaths. This proportion is small and it is not valid to conclude that these results represent the larger patient population. The authors point this out themselves. That is not to say that these observations are uninformative, but it does mean that most autopsy study data suffer from selection bias and this has to be considered when one discusses study results and their implications.

Role of autopsy in tracking disease prevalence and in characterizing new disease

Findings on autopsy may reflect systematic shifts in the prevalence of disease states over time and may serve to highlight the limitations of current medical imaging and other diagnostic procedures. In 1983, Goldman and colleagues analyzed 100 randomly selected autopsies from each of the academic years 1960, 1970 and 1980 at one university teaching hospital [2]. In each of these three decades, approximately 10% of autopsies revealed a diagnosis that might have led to a change in therapy or outcome had it been known prior to the patient's death. In the 1980 autopsy series, there were fewer cases of renal disease and pulmonary embolism but a dramatic increase in systemic bacterial, viral and fungal infections. Renal disease became a less prevalent cause of death because of the introduction of long-term renal replacement therapy. Pulmonary embolus

was better diagnosed by improved imaging modalities, and infectious complications increased because newer chemotherapy practices resulted in a greater population of immunocompromised patients. Autopsy findings helped to highlight shifts in clinical practice and to inform the clinician of new sequelae of emerging treatments.

Autopsy studies are essential to characterize newly emerging diseases. The recent severe acute respiratory syndrome (SARS) epidemic illustrates this point. It was hypothesized that the corona virus-induced pneumonia was associated with acute lung injury but pathological information was required to confirm this. Autopsy data suggest that lung injury in SARS patients is diffuse alveolar damage and is histopathologically consistent with that of the acute respiratory distress syndrome (ARDS) [3].

Role of autopsy in education, quality control and clinical decision-making

Major discrepancies noted from autopsy studies may have important implications for our own education and for that of our housestaff. Fernandez-Segoviano and colleagues [4] evaluated 100 consecutive autopsies from patients in a multidisciplinary intensive care unit and noted a discrepancy rate of 22% between premortem and postmortem diagnosis. Blosser and colleagues reported a discrepancy rate of 27% on 41 autopsies from medical intensive care unit patients [5]. Each of these studies identified three major diagnoses that had been overlooked: acute myocardial infarction, pulmonary embolism and occult infection. The Perkins and colleagues' study [1] reports similar findings. These observations are consistent across different patient populations, countries and investigators, and they should heighten our surveillance for these commonly missed diagnoses.

Autopsy findings may have important implications for quality control programs in the intensive care unit. Mort and Yeston observed a 41% discrepancy rate between premortem and postmortem diagnosis in patients admitted to a surgical intensive care unit from 1986 to 1992 [6]. They noted that the majority of discrepancies were due to undiagnosed infection and that one-half of these were fungal in origin and were found in transplant patients. As a result of this observation, these investigators initiated an enhanced infection control program at their institution.

Some investigators have suggested that autopsy data might be helpful in bedside clinical decision-making in specific patient groups. Withdrawal of life-sustaining treatment is a frequent mode of death in critically ill bone marrow transplant patients, and end-of-life decision-making is based on clinical data. Al-Saidi and colleagues [7] determined the degree of concordance between premortem and postmortem diagnoses in this patient group in an attempt to enhance the level of certainty surrounding this practice. They reviewed 28 autopsies in critically ill bone marrow transplant patients

and found that only 7% of discrepancies would have altered therapy and none would have altered outcome. These authors suggested that reliance on clinical data may be valid for withdrawal of life-sustaining treatment decision-making in view of the significant agreement between clinical diagnosis and postmortem findings.

Conclusion

Autopsy continues to have an important role in the management of the critically ill patient. It is an invaluable tool in the characterization of newly emerging diseases such as SARS. As well, it is an important quality assurance measure that tracks changes in disease prevalence over time and identifies significant, and possibly remediable, contributors to ICU death. In certain discrete patient groups, it may reinforce the degree of certainty surrounding end-of-life decision making. Autopsy continues to provide unique and valuable data and it is not obsolete in critical illness.

Competing interests

None declared.

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