



H54 Diagnostic Accuracy of Postmortem Imaging vs. Autopsy: A Systematic Literature Review

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After attending this presentation, attendees will have a better perception of the scientific evidence, or lack thereof, for substituting the autopsy with postmortem imaging, a better understanding of the problems with published research, and more information concerning what is needed to enhance this level of knowledge.

This presentation will impact the forensic science community by providing information concerning the lack of scientific evidence for the diagnostic accuracy of postmortem imaging and by describing how to help focus future research.

The autopsy has long been regarded as the “gold standard” for retrospective quality assessment of clinical diagnoses; comparisons of clinical diagnoses and autopsy findings have revealed major discrepancies in 25% or more in deceased, autopsied patients; however, during the past 50 years, clinical autopsy rates have drastically declined in the Western world.^{1,2} The reasons for this are manifold and include advances in laboratory diagnostic technology and imaging techniques that often — wrongfully — result in the belief among clinicians that the autopsy has become redundant.

A low autopsy rate may conceal medical malpractice and thereby prevent an important quality assurance indicator in health care. The reliability of the cause-of-death statistics decreases and the family may be given wrongful or insufficient information. Hence, the decrease in the clinical autopsy rate has negative consequences for the family, for future patients, for health care, and for society as a whole.

Postmortem imaging has emerged as a possible alternative to compensate for this continuous decline in clinical autopsies. In medicolegal autopsies, postmortem imaging has been used for more than a century as a complement; however, the diagnostic accuracy of postmortem imaging for various types of findings was not previously systematically analyzed and this is the focus of the present literature review.

A literature search was performed in the databases PubMed®, EMBASE®, and Cochrane Library through January 7, 2015. Only published studies in English and with ten or more individuals were accepted if the results were presented on an individual level. The criteria for eligibility included population studies on deceased individuals of any age in a forensic or clinical setting; index test studies on diagnostic imaging techniques used in clinical practice today (Computed Tomography (CT), Magnetic Resonance Imaging (MRI), ultrasound, and conventional X-ray techniques); reference test autopsy and/or histopathological examination; and outcome measure diagnostic accuracy of a specific finding expressed as *sensitivity and specificity*, or *agreement and discrepancy*.

All studies of potential relevance according to the inclusion criteria were obtained in full text and two reviewers independently assessed them for inclusion. The relevant publications were assessed for risk of bias using the QUADAS tool and classified into having low, moderate, or high risk of bias according to defined criteria.³

The search generated 2,600 abstracts, of which 340 were assessed as possibly relevant and read in full text. After further evaluation, 71 studies were included in total, 49 assessed as having high risk of bias and 22 as having moderate risk of bias.

In general, based on the current scientific literature, it is not possible to determine the diagnostic accuracy of postmortem imaging in conjunction with, or as alternative to, autopsy. The reason for this is that the included studies have investigated different populations, used different techniques, and analyzed and presented the results in different ways. Hence, the results from different studies cannot be weighed together; however, individual studies can indicate for what findings the techniques might be useful (e.g., for determining organ weights) and that imaging techniques are superior to autopsy in detecting gas.

To correctly determine the usefulness of postmortem imaging, future studies need improved planning, higher quality, and larger materials. Cooperation in multicenter studies could be one way to proceed.



Pathology/Biology Section - 2016

Reference(s):

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 3. Whiting P., Rutjes A.W., Reitsma J.B., Bossuyt P.M., Kleijnen J. The development of QUADAS: a tool for the quality assessment of studies of diagnostic accuracy included in systematic reviews. *BMC Med Res Methodol* 2003;3:25.
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