

Role of Forensic Pathology in Clinical Practice and Public Health: Need for a Re-birth

Onyiaorah IV

ABSTRACT

Background: *Forensic pathology is fashioned primarily to provide expert service to the justice system as it relates to investigation of death and criminal trial. However, the role is broader as it plays important role in medical research and is of immense benefit to clinicians, patients, and the public health system. The request for and performance of autopsy have been on the decline despite its obvious merits to medical practice, the patients and public health. Several surveys have exposed some reasons for this decline.*

Method: *This work is a review of the role of forensic pathology to medical practice and public health. The author reviewed selected relevant literatures and put together the role of forensic pathology to proper health planning and efficient patient care.*

Conclusion: *A need for the rebirth of autopsy practice is emphasized by highlighting the need for awareness creation among doctors and the general public.*

Keywords: *Autopsy, forensic, medical practice, public health.*

INTRODUCTION

Forensics is a science dedicated to the systematic collection and analysis of evidence to establish facts that can be presented in a legal proceeding. The 6th edition of Oxford English Dictionary stated that forensics was derived from a Latin word meaning "forum".¹ In ancient times, the Romans would try criminals and people accused of wrongdoing in the public. A public trial is presumed to be open and fair. Pathology is also derived from two words, "pathos" (suffering) and "logos" (knowledge)². It is therefore, the study of suffering or disease. The crux of forensic pathology workload is death investigation, which autopsy is an important component part.

Autopsy is derived from a Greek lexicon, Autopsia, which means "seeing with one's own eyes"³. It is a post-mortem examination to determine the cause and mechanism of death and to reveal the extent of a disease of interest and other associated pathology. In the years preceding 1960s, the practice of autopsy was in the main stream of medicine and was crucial in the discovery, characterization and understanding of diseases. In fact, it was viewed as the key to research and development in medical practice; an immeasurable resource to medical education and public health⁴. Paul Brussaral, emphasizing that autopsy is of little disadvantage but has huge potential benefits to the majority of people, stated that "a surgical procedure is attended with pain and is for the benefit of the individual,

while an autopsy is free of pain and is for the benefit of humanity"⁵.

Over the years, researchers have seen a global temporal decline in the request of and rate of autopsy despite the acclaimed merits of the practice⁶⁻⁹. Several reasons have been put forward for the obvious decline. A summary of reasons for the decline in autopsy rate from research studies are: availability of modern high-tech diagnostic techniques (particularly the advancement in radiology and molecular biology), failure to obtain consent, shortage of pathology services, concerns about cost, unawareness of the true benefit by the medical community, doctors' fear of litigation, religious and cultural practices of the people and government policy⁶⁻⁹.

FORENSIC AUTOPSY, PUBLIC HEALTH AND CLINICAL PRACTICE

There are two broad categories of autopsy, namely—hospital and forensic or medico-legal autopsy. Hospital autopsy is that required as a part of continuing management of the deceased patient. It is necessary for thorough examination and in-depth understanding of the major and minor diseases, the cause and mechanism of death and the role of all the factors that impacted on the deterioration and eventual demise of the deceased, while auditing the accuracy of clinical opinion and efficiency of the therapeutic measures undertaken in the process of patient management. Forensic autopsy is that required by law. Forensic autopsy is a post-mortem examination of a body performed with the intent of determining the cause, mechanism and probable manner of a death in question. A complete forensic autopsy may require evaluation of evidence attached to the body and/or found at the scene, and reconstruction of the scene itself¹⁰. From the foregoing, it will seem evident that forensic autopsy is far-reaching and relatively more involving. Despite proffering answers to medical issues, the results of forensic autopsy are expected to be transcribed to lay-knowledge as it is expected to serve the need of the judicial system, and will often face judicial and public scrutiny.

Autopsy benefits diverse groups: the medical society, the bereaved family and the general public derive some useful information from autopsy¹¹. Forensic autopsy is, in fact, an important part of criminal investigation and trial; hence, it plays a crucial role in the criminal justice system. Forensic autopsy replaces conjecture with facts. Revelations of factual concrete material evidence from forensic autopsy help in obtaining conviction in criminal trial. These provide the prosecution with a powerful tool to lock up dangerous criminals, hence contributing to a safer society. Besides being a social problem, crime and insecurity can rightly be regarded as a public health issue.

Investigators conducted a study on pooled multi-institutional data and showed that the base probability of autopsy detecting a major clinical error is estimated to be 25.6%. They further inferred that for every 10% increase

*Department of Histopathology, Faculty of Medicine, Nnamdi Azikiwe University, Nnewi Campus.
Email: vitroni@yahoo.com

in autopsy rate, there was a relative decrease of class-1 error by 7.8%¹². A class-1 error is a discrepancy in major diagnosis, the knowledge of which would have changed patient's management and potentially prolonged survival or resulted in cure¹³. Knowledge of class-1 error may elicit litigation; this perhaps supports one of several reasons for clinicians' apparent lack of interest in obtaining consent for post-mortem examination^{6,7,9}. Nevertheless, autopsy can give confirmation, clarification and correction of ante-mortem clinical diagnoses; hence, it is a resource for clinicians to improve their knowledge of what happened, what worked and what would have been effective¹⁴. Forensic and hospital autopsies therefore provide information for clinical audit and quality control¹⁵⁻¹⁷.

Immense body of medical knowledge is gathered from forensic autopsy. This valuable knowledge has great potential to improve the quality and standard of students' medical education and continuing education of doctors. Enhanced medical education will in turn impact positively on the knowledge of medical personnel and quality of patient care⁸.

Forensic autopsy provides the major proportion of organs and tissues for donor-tissue banking. Efficient retrieval of good quality organs and tissues for transplant surgery is invaluable in the management of conditions such as burns, chronic renal failure, among other diseases. Availability of compatible organ is in fact the answer in the management of end-stage organ diseases. Reliance of the medical community on this source of quality organs and tissues cannot be overemphasized. Tissues from forensic autopsy may also be used for research that may contribute to the advancement of medicine¹⁸.

Sudden unexpected deaths, particularly among the young, form an important workload of the forensic pathologists. Results from these deaths (for instance, the finding of cardiomyopathies and channelopathies) have constantly educated the medical community, including pathologists. Forensic autopsy therefore, contributes knowledge that helps in improving a nation's life expectancy, keeping the young relatively healthier and alive to contribute their quota to national growth. Genetic anomalies remain the common cause of perinatal deaths; despite the benefit of modern diagnostic techniques, necropsy remains essential for the confirmation of the type and extent of the anomaly and how it affected the quality of ante-mortem life¹⁹⁻²¹. Knowledge is derived from neonatal autopsy that informs appropriate genetic counselling of bereaved families^{22,23}. Counselling may inform families on siblings' need for life adjustment and/or advice on the need for a particular therapy to forestall the complication of the disease and improve life expectancy and quality of life of the aberrant gene bearer. Sometimes, such information will guide the choice of future partners which will probably reduce the chances of the disease afflicting future off-springs, particular in diseases with

recessive pattern of inheritance²⁴.

Autopsy, generally, can be used to assess the safety and efficacy of a new therapy or medical management procedure. When a patient (or a subject in case of drug trial) dies during drug therapy, an autopsy may reveal the subject-drug interaction and also provide specimen for further study in this regard. This information is, particularly, very helpful in both phase-III drug trial and also in post-market surveillance, as was the case with thalidomide foetal toxicity^{24,25}. Revelation of thalidomide teratogenicity, despite its emotive and devastating impact, was very useful to both the obstetric services and the public health systems. It also quickened the requirement for better structured methodology for drug testing, auditing and post-market surveillance for every intervention intended for use in humans and animals.^{25,26}

Forensic autopsy is very valuable in providing information for injury prevention and trauma management. Research in traffic medicine, including autopsies with study of injury mechanisms and death, has generally informed policy changes in many nations. United States of America House Representatives after an exquisite summary of a report from a committee on traffic and safety introduced optional fitting and wearing of car-seat belt in 1955²⁸. Similarly, Australia introduced the same legislation in 1960²⁹. This legislative injunction was later made mandatory in many countries including Nigeria after assessing its positive impact on road safety and reduction in fatalities. Modern cars are now fitted with collapsible steering wheels and protective air-bags among other protective devices. Similar research and development are on-going to reduce industrial and home accidents. Forensic autopsy notably has offered in-depth knowledge into many occupational diseases³⁰. In the same vein, the effects of industrial effluents on human health have been well studied from autopsy findings. The results of these have provided evidence-based policy instruments for approval of industrial sites, waste disposal, prevention of future adverse occurrence and compensation for the adversely affected individuals or communities. Instances of this event has been reported in several communities including Nigeria and India^{31,32}.

Forensic autopsy examinations of suicide, homicide and victims of terrorism can reveal harmful implements, chemicals, biological weapons and so on, used by the victims or assailants as the case may be. Autopsy of suicides and deaths of persons in custody (mental facility and prison) helps in policy review geared towards prevention of recurrence. Moreover, the information derived from such autopsies can aid investigation and/or prosecution of negligent and/or culpable staff members of the facility.

It is the duty of the public health agencies to conduct disease surveillance and to eradicate concerning

communicable diseases. Same applies to lowering the burden of other diseases such as cardiovascular diseases, malignancies and obesity. Forensic autopsy can reveal the presence of clusters of disease that was presumably eradicated. Similarly, sporadic resurgence of already eradicated disease may be spotted by the conduct of hospital or forensic autopsy. Emergence of new diseases, particularly those which treatment is not available, is often diagnosed and studied through autopsy⁵. Autopsy provides epidemiological data, cause and pathogenesis of a disease of interest. The data so derived help in public health planning and policy decisions.

Furthermore, forensic autopsy plays an important role in the accuracy of death certification and correction of errors in previous certifications, ensuring correct death registration. Accurate death certification is a mandated civil law and serves as a medical scientific document useful for biostatistics and epidemiological research²⁹. Therefore, forensic autopsies complement other sources of quality vital statistics and epidemiological data. Ideally, attending doctors can certify death only when they are certain of the cause^{12,34}. Vital statistics have long been known to be of immense value to public health and national planning³⁵.

In the event of mass disaster, forensic autopsies aid in reconstruction of the incident and information so derived immensely help in understanding of both remote and immediate causes of human injuries and fatalities. This in turn advises public policies change. Furthermore, disaster victim identification (DVI), a service provided majorly by forensic autopsy and the adjunct investigations, helps in giving the deceased persons accurate identification, enabling proper funeral. Such accurate identification helps local and multinational update their vital statistics.

It is a true presumption that a good share of the advancements in medicine has been derived from what is learned from autopsy⁵. Rather than fear of exposing doctors' mistakes, the medical community should see post-mortem examination as a quality control and assurance process. Autopsy in many occasions will reassure the bereaved person(s) on the efficiency and integrity of the health system, while enhancing their confidence on the medical decisions taken by the attending medical team¹⁷.

CONCLUSION

It is imperative that continuous awareness of the good of autopsy be created. Sound policies for hospital and forensic autopsies shall be encouraged and supported for the many benefits to medical practice and public health to be accessed. Pathologists should on their own part, continuously acquire knowledge of diseases and hone their skill in sound autopsy practices. More

importantly, the pathologists should strive to attend to their case works promptly and ensure good and understandable communication of results of autopsies in the most valuable manner to all concerned persons and institutions. These will probably enable good collaboration with concerned person(s) and enhance the benefit of even the most latent role of autopsy.

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