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Commentary/Letter to Editor

The role of forensic pathology in the COVID-19 pandemic in Zambia

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ABSTRACT

Although forensic pathology is less visible on the front lines of public health, it plays a significant role in safeguarding public health by investigating and identifying unusual infectious disease deaths such as those caused by COVID-19. Given that forensic pathology is responsible for investigating deaths that are sudden, unexplained, or unattended by a physician, its participation in mortality and disease surveillance contributes data useful to clinicians and epidemiologists. The data provides demographic details, the extent of disease, and causes of death. Utilizing forensic pathology data provides a wealth of information that helps understand the COVID-19 disease and inform public health policy. This paper aims to describe the role of forensic pathology in the COVID-19 pandemic era in Zambia. With the confirmation of the first COVID-19 cases in Zambia, the forensic pathology service developed a screening tool for probable detection of COVID-19 infections in brought-in-dead cases undergoing forensic autopsies at the University Teaching Hospital. The screened cases were tested for COVID-19. Notably, most of the COVID-19 deaths recorded in Zambia are from the BID that were tested. During the COVID-19 pandemic, autopsies were conducted using forensic pathology principles to determine the cause of death and document the extent of disease, thus contributing to the body of knowledge in public health and infectious disease science COVID-19. In conclusion, the forensic pathology service has contributed to the management of patients infected with COVID-19. It has also been useful to public health through mortality and disease surveillance of brought-in-dead cases.

Introduction

The first case of COVID-19 was reported on December 31st, 2019, in Wuhan, China. Since then, the infection has spread, causing a worldwide pandemic [1]. The World Health Organisation (WHO) declared COVID-19 a global pandemic in March 2020 [2]. Zambia recorded its first case in March 2020 and the cases have since risen to 13,539 with 312 deaths recorded as at September 13th, 2020 [1,3].

While less visible on the front lines of public health, forensic pathology plays a vital role in safeguarding public health by investigating and identifying unusual infectious disease deaths such as those caused by COVID-19. Given that forensic pathology investigates deaths that are sudden, unexplained, or unattended by a physician, its participation in mortality and disease surveillance contributes data useful to physicians and public health specialists [4]. This data provides accurate demographic details, extent of disease, and causes of death and that is useful in informing public health policy [4,6,7].

Forensic pathology uses the autopsy as a tool in refining the body of knowledge in diseases by utilizing its findings to provide a wealth of information about diseases such as COVID-19 [4,5].

This paper aims to describe the role of forensic pathology in the COVID-19 pandemic era in Zambia.

Discussion

When the first cases of COVID-19 were confirmed in Zambia [3], the forensic pathology service developed a screening tool to detect cases that were suspicious for COVID-19 for infection prevention as little was known about the infection at the time [6,8]. The screening tool was a questionnaire that was administered to the next of kin among the Brought-In-Dead (BID) cases undergoing forensic autopsies at the University Teaching Hospital (UTH). Information about flu-like symptoms before death was obtained. A history of headache, cough, sore throat, fever, shortness of breath/difficulty breathing, nausea, vomiting, diarrhea, chills, contact with other people with flu-like symptoms, travel to high-risk areas, contact with known COVID-19 infected persons, and occupation was obtained to categorise BIDs for COVID-19 infection [9]. BID cases were categorised into deaths with a high index of suspicion, low index of suspicion, no index of suspicion, and cases without information on the circumstances surrounding the death. Decedents, who fell in the high index of suspicion category, had "flu-like symptoms" symptoms consistent with an acute infectious illness and died while experiencing those symptoms. COVID-19 infection could not be ruled out as no sufficient explanation for this illness existed. Decedents with "flu-like symptoms," but had other significant co-morbid conditions that most

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likely accounted for their deaths were categorised as low index of suspicion for COVID-19 infection. Decedents with limited or no index of suspicion did not experience flu-like symptoms prior to death, and no history of travel to high-risk areas in Zambia or abroad. The last category was of BID cases without information on the circumstances surrounding the death. [9]. Deaths in the first and second categories were then swabbed for COVID-19 testing.

The Ministry of Health adopted the swabbing of BIDs through the Zambia National Public Health Institute (ZNPHI) and the Infectious Disease Unit (IDU). This was scaled-up through the nationwide swabbing of all the BIDs by the mortality and disease surveillance team that co-opted the forensic pathology team because the initial swabbing of BIDs at UTH revealed a lot of positive COVID-19 cases. The forensic pathologists were tasked with designing training materials and training mortuary staff to swab and manage data for COVID-19 surveillance purposes in all BIDs. The mortuary attendants were trained to screen for "flu-like symptoms" and record the data obtained on a laboratory form submitted together with the testing sample. Notably, most of the COVID-19 deaths recorded in Zambia are from the BID cases that were swabbed as a result of the screening [10]. This demonstrates the significance of BID cases in mortality and disease surveillance as pertains to COVID-19 infection. Thus mortality surveillance and disease is an essential response to the nationwide COVID-19 pandemic fight [11].

During the COVID-19 pandemic, the forensic pathology service opened its doors to allow comprehensive autopsies in COVID-19 suspected and confirmed cases to be conducted in the BIDs and hospital cases. This was to contribute accurate data to physicians and public health specialists to better manage the pandemic [6,12]. Autopsies were conducted using forensic pathology principles to determine the cause of death and document the extent of disease. Thus, forensic pathology practice was modified to cater for the COVID-19 pandemic instead of focusing only on the criminal justice system [13].

Working with the IDU at the UTH, a continuous feedback loop between IDU physicians and forensic pathologists on clinical and autopsy findings was maintained. The autopsy findings were discussed, and an autopsy report was produced. This informed the physicians about the extent of the disease and allowed the formulation clinicopathological correlation to better manage patients [5]. We note that comprehensive autopsies offer tremendous insight into deaths due to COVID-19 infections by allowing better evaluations of the extent of disease [6,7] than PCR testing alone. Autopsy reports also detailed COVID-19 deaths and identified comorbidities that may have been missed at the clinical level and from the circumstances surrounding the death [5]. Some of the comorbidities included advanced HIV disease, disseminated Kaposi's sarcoma, congestive heart failure, disseminated tuberculosis, and severe atherosclerotic heart disease. Notable also were three cases of decedents in their twenties who died of COVID-19 infection without comorbidities [14]. Thrombosis in various organs was a very common finding in our cases with COVID-19 [15]. This finding has strengthened the evidence from a local perspective on physicians' need to administer anticoagulants in managing their COVID-19 patients [15].

Conclusion

Forensic pathology has contributed to the management of the COVID-19 pandemic through mortality and disease surveillance. Working with IDU provided forensic pathology an opportunity to input data into case management of COVID-19 patients.

Declaration of Competing Interest

The authors have no conflict of interest to report.

Key point

Contribution of forensic pathology to the fight against COVID-19 pandemic in Zambia.

CRedit authorship contribution statement

Luchenga Mucheleng'anga: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Resources, Data curation, Writing - original draft, Writing - review & editing, Visualization, Project administration. **Cordilia Himwaze:** Conceptualization, Methodology, Validation, Formal analysis, Investigation, Resources, Data curation, Writing - original draft, Writing - review & editing, Visualization, Project administration.

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