

INCREASING THE AVAILABILITY OF POST-MORTEM IMAGING FACILITIES SHOULD BE RECOMMENDED FOR THE BENEFIT OF THE UMMAH

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Abstract

Muslims usually decline when asked to consent to a clinical post-mortem examination for a deceased family member. The low number of clinical post-mortem examination will result in Muslims in particular, and Malaysians in general, being deprived of the benefits of a clinical post-mortem examination. This article is a review looking into why Muslims are reluctant to consent to clinical post-mortem for their relatives, the Islamic rulings in Malaysia with regards to post-mortem examination, and the benefits of conducting a clinical post-mortem examination. The emerging field of exclusive post-mortem imaging (PMI) or non-invasive autopsy will be discussed. A brief analysis will be conducted to assess whether exclusive PMI facilities can be developed in Malaysia. We believe exclusive PMI will be acceptable to Muslims and Malaysians and will result in a higher number of clinical post-mortem examination in the country. The setting up of exclusive PMI facilities is also feasible with regards to funding, logistics and personnel and should be recommended for the benefit of the Ummah.

Keywords: *Conventional autopsy, clinical post-mortem examination, post-mortem imaging.*

INTRODUCTION

A post-mortem examination or autopsy is a medical examination of a dead person's body in order to find out the cause of death (*Cambridge Advanced Learner's Dictionary*, 2020). Forensic or medico-legal autopsy is performed according to the instructions of the legal authority responsible for the investigation of criminal, litigious, unnatural, suspicious, or sudden death (Dogan & Demirci, 2018). Clinical or academic autopsy is where the medical attendants seek to learn the extent of the disease, with the consent of relatives (Dogan & Demirci, 2018). In addition to studying the cause of death, clinical post-mortem examination is utilized to study the pathology of the disease

which caused the death even when the cause was determined before death. It is clinical post-mortem examination which this article addresses.

From our experience, the number of clinical post-mortem examination conducted in Malaysia is small, especially among the Malay Muslim community. Relatives will usually comply with forensic autopsies because forensic autopsies are mandated by law and are considered a *dharurah* (necessity). On the other hand, there is no legal obligation for relatives to give consent for clinical autopsies. Muslims believe in the concept of *qada'* and *qadar* (predetermination and fate) and do not see the need to further investigate something which has been predetermined by God. There is also a *Hadith* narrated by 'Aisyah (r.a):

"Breaking the bone of one who is dead is like breaking it when he is alive" (Hadith. Abu Dawud. Kitab: Al-Jana'iz. No.3207).

Thus, many Muslims believe that any form of alteration to the dead body to be a sinful act and an affront to the dignity of the deceased. Another issue is autopsies will likely delay the funeral of the deceased. There is a *Hadith* narrated by Abu Huraira where the Prophet (pbuh) instructed:

"Hurry up with the dead body, for if it was righteous, you are forwarding it to a good thing, and if it was otherwise (not righteous), then you are putting off an evil thing down your necks." (Hadith Al-Bukhari. Kitab: Al-Jana'iz. No.1315).

Conventional post-mortem examination involves the use of incisions to gain access to body cavities and structures. Post-mortem imaging (PMI) or digital autopsy is an advanced, non-invasive process, which involves various modalities, such as computerized tomography (CT) and magnetic resonance Imaging (MRI) scans (Islam et al, 2018). These scans are then used to develop three-dimensional images for evaluation of the entire body. PMI is sometimes used in conjunction with autopsies. Exclusive PMI or non-invasive post-mortem examination is when only imaging methods are utilised and no incisions or any form of alteration to the body is made.

In order to increase the number of clinical post-mortem examination in Malaysia, especially among the Malay Muslim majority, several issues must be addressed:

1. The clinical post-mortem examination method must adhere to the principles of *Syariah* where there is no alteration to the body and the funeral rites are not delayed.
2. The clinical post-mortem examination must be beneficial to the deceased, his or her relatives, or to society.
3. The post-mortem examination method used to determine the cause of death must have an appropriate accuracy rate.

4. The post-mortem examination method must be acceptable to Malaysians.
5. The setting up of the clinical post-mortem examination facilities in Malaysia must be feasible with regards to funding, logistics and available personnel.

We believe exclusive PMI fulfils the five criteria outlined above.

EXCLUSIVE POST-MORTEM IMAGING AND THE PRINCIPLES OF SYARIAH

When there is no *dharurah* or compelling reason to dissect the dead body or to delay the funeral rites, conventional autopsies should be avoided as mentioned in the *hadiths* above. The Malaysian National Fatwa Committee in its 8th meeting in 1984, listed conditions regarded as *dharurah* where post-mortem examinations are permissible: criminal cases, the retrieval of something valuable swallowed by the deceased, or to deliver a live foetus in a deceased who is pregnant (Kompilasi Pandangan Hukum Muzakarah Jawatankuasa Fatwa Kebangsaan Bagi Hal Ehwal Ugama Islam Malaysia, 2015).

In its 61st meeting in 2004, the Committee added two additional reasons where post-mortem examinations are permissible (in non-criminal cases): medical research and education (Kompilasi Pandangan Hukum, 2015). The National Fatwa Committee in its 73rd meeting in 2006 stated: ‘It is obligatory to choose the Virtual Autopsy method in post-mortem examinations, when there is a necessity to conduct a post-mortem examination, compared to conventional autopsy methods’ (Kompilasi Pandangan Hukum, 2015).

When considering the *hadiths* and the three *fatawa* above, there are several points which could be highlighted:

- a) The premise of all the *fatawa* is that conventional autopsies are fundamentally forbidden.
- b) When there is a necessity or *dharurah*, post-mortem examinations are permissible. The conditions of permissibility mentioned in the 1984 fatwa are in accordance with the conditions for a forensic or medico-legal autopsy.
- c) In the 2004 fatwa, medical research and education were added as conditions where autopsies are permissible in non-criminal cases. These two conditions are in accordance with a clinical or academic post-mortem examination.
- d) The 2006 fatwa stated that virtual autopsy methods should take precedence over conventional autopsy methods. This statement most likely incorporates both forensic and clinical post-mortem examination.
- e) In clinical practice, the conventional autopsy method is regarded as the most accurate method or gold standard in determining the cause of death. This is

important in medico-legal cases where the evidence provided must be admissible in a court of law.

- f) The findings of a clinical post-mortem examination are usually not as crucial as the findings of a forensic post-mortem examination as the cause of death is not used for medico-legal purposes. This means an alternative method with a lesser accuracy level can be utilised. This is where exclusive post-mortem imaging or virtual autopsy can play a role.
- g) Withstanding the fact that clinical post-mortems are not for the legal system, clinical post-mortem examination should be recommended as it has benefits of which will be discussed below.

THE BENEFITS OF CLINICAL POST-MORTEM EXAMINATION

It is important to know the causes of deaths in a population for epidemiological (data on diseases) studies. Such data is important for the formulation of health policies in a country. One example is the recommendation by the World Health Organization (WHO) for clinical autopsies to be conducted for deaths involving maternal deaths, newborns and those under the age of five years as part of the WHO Sustainable Development Goals (SDG) point 3.1 and 3.2 (World Health Organization, 2015). With the data collected, the aim is to reduce the number of preventable deaths.

In recent COVID-19 pandemic, clinical post-mortem examination provides data on the pathological findings thus improving further understanding of the disease. The cause of death identified by clinical post-mortem examination is beneficial for surviving relatives. If the disease which caused the death is identified as a preventable disease, relatives can take preventative measures from acquiring the disease. In unexpected deaths, even when criminal elements are not suspected, a sense of closure is important for (some) grieving relatives. Clinical post-mortem examination can facilitate this process.

Conducting more clinical post-mortem examinations, especially exclusive post-mortem imaging, is important for audit, research, training and education. The better we are at conducting exclusive PMI, the higher its accuracy rate will be. It may then be possible for exclusive PMI to be at par with conventional autopsies and be admissible at the courts of law; and can be an alternative to conventional autopsy.

THE ACCURACY AND ACCEPTABILITY OF EXCLUSIVE POST-MORTEM IMAGING

Conventional autopsy is the gold standard in determining the cause of deaths. Post-mortem imaging is frequently used in conjunction with conventional autopsy. Exclusive post-mortem imaging or non-invasive post-mortem examination is gaining

approval from more authorities for clinical post-mortem examination cases. For more centres to provide exclusive PMI services, exclusive PMI needs to have the appropriate accuracy level when compared to conventional autopsies. Another important factor is the acceptability of Malaysians in general, and the Muslim population in particular, to exclusive PMI.

The accuracy rate of exclusive PMI using computed tomography (CT) or magnetic resonance imaging (MRI) scans when compared to conventional autopsies is approximately 70% and 60% respectively (Roberts et al., 2012). Nearly half (47%) of the discrepancy, when compared to conventional autopsies, was in diagnosing ischemic heart disease, whereas other discrepancies were due to pulmonary embolism, pneumonia and intra-abdominal lesions. Due to the difficulty in diagnosing ischemic heart disease with post-mortem imaging, an additional method of adding contrast to the arteries during CT scans for post-mortem examination has been developed: post-mortem CT angiography (PMCTA). When PMCTA was utilized, the accuracy rate of exclusive PMI was increased to approximately 90% (Rutty et al., 2017).

There are other methods used to increase the accuracy levels of PMIs, such as combining PMI with minimally invasive techniques e.g. laparoscopy and thoracoscopy, and 3D-surface scanning. We believe that relatives of the deceased will regard the combination of minimally invasive techniques with PMI as not acceptable due to the need to make multiple small incisions and holes to the body. This is against the spirit of the hadith narrated by Abu Dawud above. 3D-surface scanning is still at the early stages of being developed for post-mortem examination purposes and requires further evaluation before widespread application.

In terms of acceptability of Muslims to exclusive PMI, there was a study which looked into this issue among Muslim and non-Muslim populations in the United Kingdom and Libya (Taher et al., 2018). The study used questionnaires to determine the perception of the participants with regards to certain aspects of post-mortem examination and post-mortem imaging. It was found that post-mortem imaging was perceived to better maintain the dignity of the body and has a less negative emotional effect on the family when compared to conventional autopsy. This was because post-mortem imaging is less invasive and takes less time to conduct. The same perception was found among the non-Muslim population, albeit to a lesser degree.

THE ESTABLISHMENT OF EXCLUSIVE POST-MORTEM IMAGING FACILITIES IN MALAYSIA

To set up exclusive PMI facilities in Malaysia, several issues require further examination. They include funding, logistics and personnel. Based on what has been discussed before, we are of the opinion that the appropriate exclusive PMI modality

to be utilised in Malaysia is CT scan, and preferably, with post-mortem CT angiography (PMCTA). This combination will produce a high accuracy rate in diagnosing the cause of death.

Initially, the facility could be set up in all state capitals in Malaysia before expanding to the districts. The CT scan machine could also be refurbished units, obtained from the used market or from hospitals when the hospitals replace existing units to newer machines. In terms of the maintenance cost, the cost will be lower for post-mortem CT scan machines compared to hospital CT scan machines because CT scans for exclusive PMI will be used less frequently. The CT scan machines for exclusive PMI should be located within hospital compounds to facilitate maintenance of the machines and transportation of the deceased.

The CT scan machines are not recommended to be shared with hospital patients because the machines used by hospitals are usually already utilised beyond recommended capacity. Sharing the same CT scan machine with the deceased may also be uncomfortable for some patients. Based on the criteria above, and the additional cost to house the CT scan machines in air-conditioned rooms with lead-enforced walls, we estimate the cost to set up a 128-sliced CT scan unit to be 2-3 million Malaysian Ringgit per facility. The cost could potentially be significantly less if the CT scan machines are donated units from hospitals.

In our opinion, the Malaysian government is the most appropriate body to fund the establishment of PMI facilities. Even though the low number of the clinical post-mortem examination is essentially an issue for Muslims (Taher et al., 2018), Muslims are the majority population (61 per cent) in Malaysia (Taburan Penduduk dan Ciri-ciri Asas Demografi, 2010) and the low number of clinical post-mortem examination will affect the country as a whole. Other potential funding bodies include state Islamic authorities or the various Islamic foundations in our country.

Extra personnel will be required. The personnel include forensic pathologists, radiologists, medical officers, medical assistants, attendants, clerks and drivers. In the initial stage, the personnel can be employed from existing hospital staff who will work at the exclusive PMI facility on an as-required basis and on-call system, considering deaths occurs at any time of the day and relatives are keen to expedite the funeral. Taher et al (2018) surveyed the time frames a Muslim population expect funerals to be conducted: less than 12 hours in 45%, 12–24 hours in 40%, and 1-3 days in 16% of the correspondents.

Funding will also be needed to pay for on-call allowances. Subsequently, when the volume of cases becomes larger, some staff may be employed on a permanent basis at the PMI facility. Looking forward, we hope to see forensic pathologists or

radiologists specialising in post-mortem imaging and advance the speciality to the next level and be at par with conventional autopsy.

CONCLUSION

There is a low number of clinical post-mortem examination among Malaysians and Muslims. This is mainly due to religious factors. Conventional autopsies are regarded as an insult to the dead body and delays funeral rites. Clinical post-mortem examination is beneficial to Malaysians and to our *Ummah* for epidemiological and health policy studies, preventive health screening for relatives, to provide a sense of closure to relatives, and for forensic training and development.

At the moment, the conventional autopsy is the most accurate method to determine the cause of death. Post mortem imaging (PMI) is occasionally used in conjunction with conventional autopsies. Exclusive PMI or non-invasive post-mortem examination is a relatively new field in forensic medicine. The establishment of exclusive PMI facilities to conduct clinical post-mortem examination should be encouraged in Malaysia. The maxim of *Qawaid fiqhiyyah* states that if there are pre-requisites to something obligatory, those pre-requisites themselves become obligatory.

Exclusive PMI adheres to the principles of *Syariah* where the body is not altered and the funeral is not delayed. Exclusive PMI has an acceptable accuracy rate and the accuracy rate will improve with widespread utilisation. The setting up of exclusive PMI facilities is feasible in Malaysia with regards to funding, logistics and personnel. Malaysia can aim to take the leading role in the development of this new field.

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