

Editorial

Shortage of Radiologists in Low to Middle Income Countries in the Interpretation of CT scans in Trauma

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Trauma is a leading cause of death worldwide low- and middle-income countries (LMIC), There is a higher incidence of trauma in LMIC than in high-income countries. Worldwide, road traffic injuries are the 10th leading cause of death and the 9th leading cause of the burden of disease¹. Injuries affect mostly young people, often causing long-term disability. In South-East Asia and Africa, males have the highest and second highest incidences of road traffic injury-related fatalities in the world¹.

Time is of the essence in managing the trauma patient. Resource restriction is a major concern for trauma care LMIC. The availability of radiological services mirrors the availability of healthcare services in a country. Severe shortages of imaging equipment and workforce exist in LMIC². Radiologist numbers in LMIC are significantly reduced compared to high income countries. In low-income countries there are 1.9 radiologists per million inhabitants and 97.9 radiologists per million inhabitants in high-income countries³.

In 2003, there was 1 radiologist per million inhabitants in Bangladesh⁴. In 2018 the population of Bangladesh was 163 million and there were only about 700 radiologists in the country which equates to 4.3 radiologists per million inhabitants⁵. Radiologist numbers in African countries in 2012 were reported ranging from 2 radiologists in Zambia

to 1250 radiologists in Egypt⁶.

The vast financial, cultural, and political diversity of LMIC is challenging for the implementation and maintenance of high-quality radiological services. The availability of radiologists has not kept pace with the increased demand for imaging worldwide. Thus, there are delays in radiological reporting and consequently patient management in several countries.

The urgent nature of trauma necessitates accuracy and speed in diagnosis and management. Radiology is key to the early diagnosis and management of the injured patient. It is widely accepted for several decades that most of the time the emergency clinician interprets radiographs in the trauma patient.

Computed Tomography (CT) scanning is utilised as an important diagnostic tool in the assessment of trauma patients. CT scans of the head are one of the most performed radiological investigations worldwide and are also the most requested cross-sectional imaging study⁷.

With the increasing availability of CT scanners even in LMIC in recent years and the low number of radiologists in LMIC, it is inevitable that the emergency clinician must interpret the CT scan in the trauma patient. This is paramount in traumatic brain injury where the effects of secondary brain injury are

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potentially reversible.

Emergency CT scans in trauma are usually interpreted by the attending doctor and plans to manage the patient are implemented before the formal radiological report is available. In some instances, there is no radiological report. Even when the radiologist is on site, the formal radiological report may be delayed. For example, the radiologist may be reporting other emergency CT scans or busy with an ultrasound in ICU. Hence, the emergency clinician is the primary interpreter of the emergency CT scan and makes management decisions based on his/her interpretation.

There have been studies comparing radiologist and emergency physician interpretation of radiological examinations; with the majority of these focusing on radiographs and a few on CT brain scan interpretation. Internationally, there have been studies assessing the interpretation of CT brain scans by attending emergency physicians or neurosurgeons with the radiologist as the gold standard.

There have also been only a few studies internationally comparing the interpretation of body CT scans between surgeons and radiologists.

In the local scenario in KwaZulu-Natal and across South Africa, owing to the historical radiologist shortage and the urgent nature of CT head scans in trauma, the neurosurgeon has sole discretion in ordering these scans without prior discussion with the radiologist irrespective of the time of day. The neurosurgeon interprets the CT head and makes management decisions based on his/ her own interpretation. The radiology report is only issued

during normal work hours. Even if the CT scan is performed during normal working hours, the neurosurgeon reviews the scan and decides on the plan of management as soon as possible without waiting for the radiology report.

Radiologists are formally trained in image interpretation and are aware of imaging pitfalls and normal variants. The surgeon has the advantage of having assessed the patient clinically and views the CT scan for abnormalities that require urgent intervention.

In a study performed at our centre in South Africa regarding the interpretation of CT scans in Trauma: Surgeon vs Radiologist, we found that there is a discrepancy in the interpretation of emergency CT scans in trauma between the surgeon and radiologist, but this does not negatively influence patient outcome.⁸

Improved patient outcomes depend on organised trauma response systems which include diagnosis and management of the injury. In LMIC, the surgeon should be able to identify critical findings on a CT scan and decide on management of the patient. The trauma system model in LMICs is to standardize training and trauma care practices in LMICs. This should also encompass CT scan interpretation by the surgeon.

Declaration: This is an invited editorial and the authors declare no conflict of interest. The studies referred to were approved by relevant ethics committees and as such the editorial does not required ethical approval.

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