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Whole body post-mortem computed tomography versus skeletal survey in the detection of fractures in suspected cases of fatal non-accidental injury

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Abstract:

AIM: To compare post-mortem computed tomography (PMCT) and post-mortem skeletal survey (PMSS) in the detection and analysis of fractures in suspected cases of fatal non-accidental injury (NAI).

MATERIALS AND METHODS: A prospective study of consecutive PMCTs was performed over a year at a tertiary hospital in Johannesburg, South Africa. All decedents underwent whole body PMCT and PMSS and were reviewed by a paediatric radiologist.

RESULTS: There were twenty decedents, 9 males (45%) and 11 females (55%) and the median age 24 months. Fractures were detected in 7/20 (35%) decedents. Five had fractures recorded on both modalities: two cranial fractures and one fracture each of the humerus, radius and ulna. One had a tibial metaphyseal corner fracture detected only on PMSS, others had two mandibular, a pubic ramus and iliac crest fracture detected solely on PMCT. There was no significant difference in the number of fractures detected in all regions, the specificity of fractures locations for NAI or fracture dating. PMCT acquisition time was faster than PMSS (median time: 4.75 and 27.63 minutes respectively) [$p < 0.0001$].

CONCLUSION: We describe the first use of paediatric PMCT in South Africa in investigating suspected fatal NAI and compare it to PMSS. Whilst there was no significant difference in the number of fractures detected, PMCT proved useful in analysing the complexity of cranial fractures and uncommon fractures of the facial and pelvic bones. PMCT is acquired faster with increased radiographer satisfaction. Larger multicentre prospective studies are required to validate these results.