

Abstract

Introduction

Gunshot injury is a common mechanism of injury in the South African context. A previously wartime entity has found itself to have a significant presence amongst civilians. South Africa has been reported to have a 26.8 per 100 000 rate of firearm deaths, the third highest rate in the world. The quantitative and qualitative data about these injuries – that place a significant burden on the patient, healthcare system and economy – are unfortunately poorly documented. The weaponry and the associated ballistics used by civilians is poorly understood, hence the potential to cause injury also needs to be investigated. The relative paucity of data surrounding gunshot injuries to the extremity, and an appropriate classification system, requires further investigation. A novel classification system was introduced by Gugala *et al.* which has not been validated in isolated extremity gunshot injuries.

Methods

A retrospective analysis of clinical records of patients presenting to two level one trauma centres in Johannesburg was conducted to provide an epidemiological understanding of this cohort of patients including the social backdrop that may contribute to gunshot injuries in the hope of identifying areas where preventative measures may be introduced. We analysed the injuries caused by the weaponry in the community and were able to draw a few inferences with regards to ballistic properties. We also applied the classification system proposed by Gugala *et al.* to determine validity using the Cronbach's coefficient alpha and Pearson's correlation coefficient. We did statistical analyses of other associations that may be used to determine injury potential with the reported description of the event including the size of the gun, and distance from the gun.

Results

We reviewed 232 isolated Gunshot injuries to the extremities in 188 patients. This included twenty-seven cases of soft tissue injury alone, and 214 fractures. We detected an 8.6% nerve injury rate. Most of the injuries occurred in the lower limb, with a greater likelihood of fractures occurring in upper limb injury patients. The majority of patients in this series were young, otherwise healthy males with reports of some kind of illicit substance use. We found that there was a significant peak of gunshot injuries that took

place around 20h00 and the mean time to presentation of 743 minutes to the Department of Orthopaedic Surgery. We derived a poor internal consistency with a Cronbach's Coefficient Alpha value of 0.3489 and poor inter-component correlation. The statistical analysis revealed that the ballistics was unpredictable relative to the size of the gun or distance from the gun.

Conclusion

The ascertained serological and radiological parameters in conjunction with the latest literature suggests that many of these patients are appropriate for early appropriate care with- or with-out surgical intervention. There are significant social correlations that would require further investigation which may be areas for prevention. Isolated extremity injuries have been shown to require expeditious assessment and appropriate management as we have found these injuries are debilitating and with a better understanding and further investigation, we may better prevent the injuries from occurring and streamline the management of these injuries to improve outcomes.