Incidence and Risk Factors for Bone Infection After Open Fractures Caused by High-Velocity Gunshots and Ballistics in War-Related Injuries

Mohammed Alsaifi, MD; *Dr. Khaled Swailem, MD; Dr. Anwer Mughalis, MD; Dr. Abdulraqeb Almarih, MD*
TMGH Hospital, Sanaa - Yemen, Sanaa, YEMEN

Purpose: Our objective was to study the Incidence and risk factors for bone infection after open fractures caused by high-velocity gunshots and ballistics in war-related injuries.

Methods: A total of 1034 adult patients were involved in this study during the period from 1 January 2015 to 31 December 2020. All the patients were either soldiers or army volunteers exposed to high-velocity gunshots and ballistics in war-related injuries. The data were collected from the patients' files, operations, and nursing admission registries. Time and type of injury, primary management, operation details, type, time, and period of antibiotics and timing of plastic surgery were the main factors selected to be studied. The patients were followed until definitive fixation applied.

Results: Most of the patients were male (98%), the mean age was 34.8 ± 6.4 years (range, 18-66 years). Tibia (32%) and femur (25%) are the most injured bones, 286 patients (27.7%) developed post injury infection. Humerus, tibia, and femur were infected in 38%, 34%, and 26%, respectively. There is no significant relationship (P<0.280) between early debridement and antibiotics administration within <6 hours (107 = 23.6%) and >6 hours (179 = 29.7%) and getting infection, but the infection rate significantly (P<0.0001) increased if delayed more than 24 hours (88 = 49.7%). Infection rate was affected significantly (P<0.0001) by surgeon experience, consultant (41 = 12.9%), specialist or residents (245 = 34%), and if the debridement and fixation was done on the morning or during 16-hour shift duties (31 = 13.5% and 255 = 31.7%, respectively. Second-look debridement and early coverage of the bone by a plastic surgeon decreased the infection significantly (P<0.0001) by 47 = 13% and 36 = 19%, respectively. Polytrauma and multiply injured patients have high infection rates, (36% and 25.7%, respectively).

Conclusion: Meticulous debridement, adequate experience of the surgeon, and early coverage of the bone are significant independent risk factors of bone infection after high-velocity gunshots and ballistics injuries. Early debridement and antibiotics administration do not have a significant role.