Penetrating cardiac trauma by firearm: better outcomes and importance of prehospital care system

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Madam, we read with great interest the article by Siddiqui et al.: "Surviving shot through the heart: Management in two cases", published recently in the Journal of Pakistan Medical Association.[1] This issue is very relevant especially in the current era of growing numbers of victims from firearms in urban or in armed conflict zones and in times of continuous improvement in the quality of care in critically affected patients. We would like to take this opportunity to add some thoughts about epidemiologic and clinical aspects of cardiac gunshot injuries.

Penetrating heart injuries from firearm usually lead to death before hospital admission, and the remaining victims who get medical attention in time still have little chance of survival even with advanced medical support. We observed high mortality rates ranging between 47 to 81%.[2,3] Although penetrating cardiac trauma are most commonly caused by stabbing (1.5 - 4.5 times more frequent than gunshot),[3] a patient victim of a gunshot heart injury has up to 13 times the risk for death compared to injured patients from stab wounds.[4] Injuries from gunshot can damage all chambers of the heart that can produce irregular and profuse bleeding and may be associated with multisystem trauma, a factor that strongly influences outcomes due to a variety of causes. Very few patients can survive and remain stable long enough to be examined sufficiently to stablish a more accurate diagnosis, and this rare condition is thought to be produced from a combination of some mechanisms like distance and velocity of bullet and affected chamber (atrium x ventricle).[1,2,5] Pereira et al.[4] found that each grade of the AAST-OIS (American Association for the Surgery of Trauma-Organ Injury Scaling) decreased the survival chance about 1.65-fold, as well as greater chance for death (2.76-fold) with an RTS (Revised Trauma Score) index lower than normal (7.84) and with an ISS (Injury Severity Score) > 25 (2.13 times risk for mortality). These data reveal the importance of physiological conditions of the patients at admission on survival chances, that clearly have improved according to the same study, which observed an increment in systolic blood pressure, Glasgow Coma Scale score and RTS index along two consecutive decades (1990-99 and 2000-09).[4] Some local improvements in the prehospital care system were decisive, like greater number of ambulances, up-to-date training programmes for emergency medical professionals and employment of faster transportation vehicles (helicopter), and this upgrading reflected in better scenarios regarding physiological status of severely injured victims when arriving to the emergency department, and thus more survivors.[4]

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References

1. Siddiqui FA, Kabeer J, Shahabuddin S. Surviving shot through the heart: Management in two cases. J Pak Med Assoc 2015; 65: 93-4.
2. Karigyo CJ, Fan OG, Rodrigues RJ, Tarasiewich MJ. Transfixing gunshot wound to the heart: case report. Rev Bras Cir Cardiovasc 2011; 26: 298-300.
3. Karigyo CJ, Silva DR, Pelisson TM, Fan OG, Tarasiewich MJ. Penetrating cardiac trauma. Rev Med Res 2013; 15: 198-206.
4. Pereira BM, Nogueira VB, Calderan TR, Villaça MP, Petrucci O, Fraga GP. Penetrating cardiac trauma: 20-y experience from a university teaching hospital. J Surg Res 2013; 183: 792-7.
5. Kangah M, Kirioua-Kamenan A, Amani A, Souaga A, Katche E, Kouame J, et al. Biventricular transfixing wound by firearm operated in the Cardiology Institute of Abidjan: a case report. J Chir Thorac Cardiovasc 2010;14: 60-2.