Session: Session XVA: Papers 21-29: Parellel Session
Paper 27: 3:30-3:50 pm

USE OF SHOTSPOTTER™ DETECTION TECHNOLOGY DECREASES TRANSPORT TIME FOR PATIENTS SUSTAINING GUNSHOT WOUNDS

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Invited Discussant: Alexander Eastman, MD

Introduction: Shorter transport times in patients sustaining penetrating trauma have been shown to be independently associated with improved survival. Literature has also demonstrated that these patients, when transported by police vehicle vs. EMS, have decreased transport times to a trauma center. The purpose of this study was to delineate if a gunshot detection technology called ShotSpotter ™, which triangulates the location of gunshots and alerts nearby police officers to respond, expedited patient transport to definitive care by increasing the likelihood of police response and patient transport.

Methods: All fatal shooting incidents, with the victim being at least 18 years old, which occurred within the city of Camden, New Jersey from 2006-2016 were retrospectively reviewed. Demographic, geographic, transportation, and field intervention data were collected from medical and police records. We compared fatal shootings where the ShotSpotter ™ technology was activated versus fatal shootings where ShotSpotter™ was not activated. Incidents which involved children, occurred outside the city limits, or where complete data was not available were excluded from the study.

Results: There were 105 fatal shooting incidents which met all of the inclusion criteria, with 24 (23%) resulting in the activation of the ShotSpotter™ system. Victims involved in shootings where the ShotSpotter™ system was activated were more likely to arrive at the trauma center for evaluation and potential resuscitation, rather than being pronounced dead in the field (55% vs 37%;p=0.037). Furthermore, these victims were more likely to be transported by police rather than by EMS (29% vs 6%;p=0.005) and less likely to have field interventions performed (25% vs 60 %;p=0.003). There was no difference in the trauma bay resuscitation efforts or number of procedures performed (intubation, ED thoracotomy, central venous access, chest tube, resuscitative medications) between the two groups (all $p>0.05$). When corrected for distance from the location of incident to the trauma center, we found that transport time in ShotSpotter™ activation incidents was significantly shorter (12min vs 16min;p=0.021).

Conclusion: The use of ShotSpotter™ technology significantly decreased transport time of victims sustaining gunshot wounds, likely due to the increased police transport of these patients rather than waiting for EMS. This resulted in fewer pre-hospital procedures and fewer victims being pronounced dead at the scene. While our data only includes incidents which were fatal, future work will involve studying the use of ShotSpotter ™ technology and its potential to improve survival.