2017 APDS SPRING MEETING

Psychological Effect of a Mass Casualty Event on General Surgery Residents

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OBJECTIVE: To evaluate the psychological effect of a mass casualty shooting event on general surgery residents.

DESIGN: Three and 7 months following the Pulse nightclub mass casualty shooting, the mental well-being of general surgery residents employed at the receiving institution was evaluated. A voluntary and anonymous screening questionnaire for posttraumatic stress disorder (PTSD) and major depression (MD) was administered. Responses were stratified into 2 groups; residents who worked (ON-CALL) and residents who did not work (OFF-CALL) the night of the event. Data were analyzed using Mann-Whitney *U* and Fisher's exact tests and are reported as median with interquartile range (IQR) or percentage.

SETTING: Level I trauma center.

PARTICIPANTS: Thirty-one general surgery residents.

RESULTS: Twenty-four residents (77%) returned the 3-month questionnaire: 10 ON-CALL and 14 OFF-CALL. There was no difference in PTSD and MD between the 2 groups (30% vs. 14%; $p = 0.61$) and (30% vs. 7%; $p = 0.27$), respectively. Twenty-three of the 24 residents responded to the 7-month questionnaire. Over time, the incidence of PTSD did not resolve in the ON-CALL group, but did resolve in the OFF-CALL group (30% vs. 0%; $p = 0.07$). There was no significant change in the incidence of MD in either group (30% vs. 8%; $p = 0.28$). At 7 months postevent, more residents in both groups stated that they had sought counseling (30% vs. 44%; $p = 0.65$) and (0% vs. 15%; $p = 0.22$).

CONCLUSIONS: The emotional toll associated with this mass casualty event had a substantial effect upon the general surgery residents involved. With the incidence of PTSD and MD identified, we believe that all residents should be provided with counseling following such events. (J Surg Ed ▮:▮▮▮-▮▮▮. © 2017 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: mass casualty, surgical residents, psychological effect, posttraumatic stress disorder, major depression

COMPETENCIES: Practice-Based Learning and Improvement, Interpersonal and Communication Skills, and Systems-Based Practice

INTRODUCTION

Mass casualty events are becoming increasingly commonplace in our society. Whether the event is an act of nature, act of violence, or an accident, the injuries and pathology can be horrific. These events stress communities, hospital systems, local/regional resources, and health care providers. While these scenarios seem to play out on a near weekly basis, there is a paucity of information on the effect they have on the individuals who provide care for the victims of these tragedies. Previous articles have addressed the long-standing effect these events can have on first responders and communities.[1-10] Other studies have looked at the under-reported incidence of PTSD in trauma surgeons who have devoted their careers to caring for the victims of trauma.[11] However, to our knowledge there are no prior studies looking at the effect of these events on surgical trainees.

On June 12, 2016, the city of Orlando was faced with the deadliest mass casualty shooting in the history of the United States. A single heavily armed gunman opened fire in the Pulse nightclub killing 49 people and injuring 58 others. Our Level I trauma center at Orlando Regional

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Medical Center received 49 victims and one SWAT team member who was shot during the altercation with the gunman. In addition to the in-house trauma attending and the ON-CALL resident team, additional trauma faculty and surgical residents responded to help provide care. Many of our surgical residents directly participated in the care of the victims during the course of their hospitalization. Counseling was available immediately after the event and the entire surgery department engaged in a large open discussion debriefing session. Recognizing the emotional toll this event had on our community, hospital system, and surgery department, we sought to evaluate the psychological effect this event had on our surgical trainees.

METHODS

Our Institutional Review Board reviewed and approved the study design with voluntary participation. A questionnaire including the primary care posttraumatic stress disorder (PC-PTSD)[12] and 2-question Patient Health Questionnaire (PHQ-2)[13] screening tools for posttraumatic stress disorder (PTSD) and major depression (MD) in addition to questions specifically related to the trainee's level of involvement in the response was developed. The questionnaire was administered to all surgical residents who were enrolled in our surgery residency at the time of the Pulse shooting 3 months after the incident. Follow-up questionnaires were sent 7 months after the incident to those who responded to the initial questionnaire. All were returned anonymously.

The PC-PTSD and PHQ-2 are validated screening tools for PTSD (Table 1) and MD (Table 2) in those who provide primary care. PTSD was defined as ≥2 "YES" responses to the questions listed in Table 1 and MD for ≥1 "YES" response to the questions listed in Table 2. The additional questions included in the questionnaire were used to determine if the residents participated in direct patient care on the night of the event and the effect of other variables (social media, media response, and debriefing/counseling sessions). Questions were answered using either "Yes"/"No" or a 1 to 10 scale (Appendix A).

At the time of the shooting, the residency consisted of 5 categorical residents per postgraduate year (PGY) and 6 preliminary residents for a total of 31 possible participants. As the Pulse shooting occurred in June, this created a logistical issue as the preliminary residents and the chief residents who were actively enrolled in the residency at the time of the event had left the program. The residents who were still active in the residency were provided with the questionnaire and responses were returned anonymously. The study coordinator contacted residents who were no longer active in the program by e-mail. The responses from the former residents who responded by e-mail were blinded to the principal investigator. The responses were stratified into 2 groups; residents who worked (ON-CALL) and residents who did not work (OFF-CALL) the night of the event. Data were analyzed using Mann-Whitney *U* and Fisher's exact tests and are reported as median with interquartile range (IQR) or percentage.

RESULTS

The initial questionnaire completed at 3 months after the Pulse shooting yielded 24 responses for a response rate of 77% (PGY I-7, PGY II-5, PGY III-5, PGY IV-5, and PGY V-2). Ten residents were in the ON-CALL group (PGY II-3, PGY III-2, PGY IV-3, and PGY V-2) and 14 residents were in the OFF-CALL group (PGY I-7, PGY II-2, PGY III-3, PGY IV-2, and PGY V-0). While the incidence of PTSD tended to be higher in the ON-CALL group than in the OFF-CALL group, this failed to reach statistical significance (30% vs. 14%; $p = 0.61$). A similar trend was seen with the incidence of MD (30% vs. 7%; $p = 0.27$). All but one of the residents who indicated they experienced PTSD were also identified as having MD.

The ON-CALL residents' responses regarding their involvement in the care of the shooting victims were evaluated. There was no significant difference between the junior residents (PGY I-III) and senior residents (PGY IV-V) in how they felt about the care they provided that night. However, the junior residents were more likely to feel "helpful" (9 [8-10] vs. 5 [3.5-10]; $p = 0.38$) and "proud" (9 [8-10] vs. 5 [5-10]; $p = 0.38$) of the work they had done than the senior residents. We also identified that the junior residents tended to be more "scared" (7 [2-8] vs. 3 [1-5]; $p = 0.21$) during the event than their senior counterparts.

TABLE 1. PC-PTSD Screening Tool

Since the Pulse nightclub mass shooting incident have you…

1.	Had nightmares about it or thought about it when you did not want to?	
	Yes	No
2.	Tried hard not to think about it or went out of your way to avoid situations that reminded you of it?	
	Yes	No
3.	Are constantly on guard, watchful, or easily startled?	
	Yes	No
4.	Felt numb or detached from others, activities, or surroundings?	
	Yes	No

PC-PTSD, primary care posttraumatic stress disorder.