The Assessment and Treatment of Non-visible Blast Injuries: the Need for Education

Diana Coseglia-Danna DNP, HNP-BC, FP-BC

Introduction: Explosions are the most common cause of casualties associated with terrorism. Explosions produce unique patterns of injury seldom seen outside combat. Few civilian healthcare professionals have experience with explosive-related injuries.

Purposes and Objectives

- Develop a teaching module for the assessment & treatment of non-visible blast injuries.
- Participants are able to:
  - Define a blast event
  - Classify explosives – high order & low order
  - Identify, assess & treat non-visible blast injuries:
    - Tympanic membrane rupture (most common blast injury & is not a marker for morbidity)
    - Blast lung (affects 30% of blast victims & symptoms may be delayed for 48 hours)
    - Abdominal hemorrhage (symptoms may be delayed for 48 hours)
    - Closed brain injuries (affects more than 50% of blast victims)
    - Post traumatic stress disorder (affects victims 4 to 6 weeks post-blast)
  - Increase the healthcare providers’ knowledge of non-visible blast injuries.

Methods and Results

- Twenty-six Wagner College nurse practitioner students participated in the pre-test, teaching module & post-test. All, but one, completed the demographic information.
- Pre- & post-test knowledge was measured and compared using statistical analysis (SPSS, Chicago, Illinois) Average pre-test score 41%; average post-test score 82%.
- The P value was not significant except for question 4 of the tests (0.02) due to small sample size, utilization of only one test group, & sample of convenience.
- 6 of the 25 nurses received prior bomb blast education: 3 as part of their nursing school education and 3 as part of their employers’ staff education requirements.
- The 6 nurses with prior bomb blast education had been nurses for less than 9 years.
- Only 1 of the 2 emergency room nurses had received prior bomb blast education.
- Of the 6 nurses with prior bomb blast education, 1 attained the highest pre-test score of 9 correct answers (60%).
- The average pre-test score for the 6 nurses with prior bomb blast education was 6 correct questions (42%) – average for all participants was 41%.
- The average post-test score of the 6 nurses with prior bomb blast education was 12 correct questions (82%) – average for all participants 82%.

Table 1: Pre vs. Post Test Total Correct Answers by Students

<table>
<thead>
<tr>
<th>Max Correct Answers</th>
<th>Pre</th>
<th>Post</th>
<th>Improve #</th>
<th>Improve %</th>
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<tbody>
<tr>
<td>390</td>
<td>160</td>
<td>320</td>
<td>160</td>
<td>100%</td>
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Avg. Grade: 41% vs. 82%

Conclusion and References

The results of this study demonstrated the need for non-visible blast injury education.

Disaster preparedness is lacking and needs to be incorporated into the curriculum of medical school education, nursing school education, medical residency programs, first responder education & new hire healthcare orientation education.

Bomb blast drills are needed to improve competency and retention of knowledge.

A disaster response plan is not adequate if responders have not received education specific to disaster scenarios.

Education & practice drills creates muscle memory.

References