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Introduction

In 2014, the “Berlin definition” (BD) was proposed by an international consensus in an attempt to standardize this popular term. Unfortunately the BD was validated on a population with only 3% of penetrating trauma (886/28,211). Our hypothesis is that BD validity is not applicable in penetrating trauma.

Methods

- **Design and Settings:** Observational study (2012-2013) from a combined trauma registry of two regional level I trauma centers.
- **Subjects:** Penetrating trauma patients (≥ 16 years), with an ISS ≥ 16 and an AIS ≥ 3 in at least two body regions were included.
- **Plan:** The main study outcome was to describe mortality rates of patients with either one or none of the associated pathological conditions/ancillary parameters (PC/AP) originally described under the BD: (Age ≥ 70 , GCS ≤ 8 , SBP ≤ 90 , base excess ≤ -6 or PTT ≥ 40 /INR ≥ 1.4). We compared our mortality with that of the BD data-base.

Results

- A total of 416 were included (Table 1).
- Overall mortality rate was 45.2%.
- In the absence of any PC/AP, mortality rate was 9.7% (11/113) and when a single PC/AP was associated, mortality rate increased to 54.3% (76/140).
- Data-base review of BD reveals a 2.9% mortality rate in the absence of any PC/AP and a 13.9% mortality rate when a single associated PC/AP ($p < .01$).
- There were significant differences in mortality rates when a single associated PC/AP was present in our penetrating trauma population when compared with that of the BD data-base ($p < .01$).

Conclusions

The presence of a single associated PC/AP in penetrating trauma patients results in a predicted mortality significantly different to the mortality predicted by the BD. In order to improve the definition of polytrauma in penetrating trauma, it is necessary to modify or introduce new clinical thresholds used to define PC/AP's that were originally included in the BD data-base validation.

Today, in its present form, the BD is not applicable for penetrating trauma and any new definition must originate from a large multiregional exclusive penetrating trauma data-base analysis.

Table

Demographic data of patients included in the study (n= 416)

Variables	Data
Age, mean (SD)	26.1 (11.3)
Male, n (%)	392 (94)
ISS, mean (SD)	28.3 (14.5)
MAIS 3 points, n (%)	115 (28)
MAIS 4 points, n (%)	180 (43)
MAIS 5 points, n (%)	95 (23)
MAIS 6 points, n (%)	26 (6)
Head injuries, n (%)	225 (54)
Thoracic injuries, n (%)	232 (56)
Abdominal injuries, n (%)	163 (39)
Extremity injuries, n (%)	66 (16)
Mortality, n (%)	188 (45)
MAIS: Maximum AIS score	