

Plasma myoglobin reflects the severity of muscle damage in patients with traumatic tibial fractures

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Introduction

The BioFACTS study is a multicenter trial to investigate the possibility of using myoglobin plasma levels in the diagnosis of acute compartment syndrome (ACS). A secondary objective is to describe the normal progression of myoglobin in patients with tibial fractures. We hypothesized that the levels of the biomarkers would reflect the severity of the muscle damage.

Methods

Between 2018 and 2021, 158 patients with tibial fractures were included in the BioFACTS study (Figure 1, Table 1). According to the BioFACTS protocol, patients were stratified into high/low energy trauma, multitrauma/single trauma, males/females and under/over 40 years of age. Mean levels of myoglobin were compared 6 h after trauma, the time-point of the expected maximum.

Results

Mean (SD) myoglobin values 6 h after the trauma were low, 261 (381) µg/L. High energy trauma yielded a higher mean of 710 (737) µg/L compared to low energy trauma 175 (167) µg/L, $p = <0,001$. Multitrauma yielded a higher mean of 1884 (2019) µg/L compared to single trauma 231 (260) µg/L, $p = <0,001$. No significant differences were found comparing males and females 308 (456) versus 183 (185) µg/L, $p = 0,09$, or patients under/over 40 years of age, 314 (514) versus 218 (220) µg/L, $p = 0,83$.

Discussion

In contrast with previous statements from the literature, myoglobin values seem promising in assessing muscle damage associated with traumatic tibia fractures. Because values seem to reflect the severity of muscle damage, myoglobin might be feasible to use in the assessment of patients with suspected ACS.