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LETTER

Preoperative Central Sensitization in Pilon Fracture Outcomes: Considerations on Grouping, Analgesia, and Data Interpretation [Letter]

Bohui Gao

Henan University of Chinese Medicine, Zhengzhou, Henan Province, People's Republic of China

Correspondence: Bohui Gao, Henan University of Chinese Medicine, Zhengzhou, Henan Province, People's Republic of China, Tel +1 860 104 0069, Email gbh20050407@qq.com

Dear editor

We read with great interest the article entitled "The Influence of Preoperative Central Sensitization on the Postoperative Prognosis of Pilon Fractures: A Retrospective Study" published in your esteemed journal.[1] The study focuses on the impact of preoperative central sensitization (CS) on postoperative pain, functional recovery, and psychological status in patients with Pilon fractures. Through retrospective analysis, it clearly identifies the phenomenon that patients with preoperative CS experience poorer postoperative recovery, providing a significant basis for individualized clinical intervention. However, we wish to raise several overlooked issues for further discussion with the authors, which may affect the interpretation and application of the results.

In the grouping methodology, the study categorized patients based solely on preoperative CS status without incorporating fracture severity as a factor. This approach risks misattributing the prognostic influence of the fracture itself to CS, thereby introducing potential confounding bias. The OTA/AO 43 classification for Pilon fractures stratifies severity based on key indicators such as comminution and articular surface involvement—factors independently established to influence post-operative functional recovery and pain relief.[2] Research by Jansen et al explicitly demonstrates a significant correlation between fracture severity according to the AO classification and both AOFAS and VAS scores.[3] We recommend supplementary stratified analysis by fracture type or multivariate regression adjustments to verify the independent effect of CS on outcomes.

The absence of detailed postoperative analgesia protocols and the lack of analysis regarding the interaction between analgesia and CS may undermine the reliability of the conclusions. The manuscript mentions "standardized postoperative medication and treatment protocols" but does not specify the application of multimodal analgesia, the rationale for drug dosage adjustments, or individualized strategies for CS patients. Given that CS significantly heightens pain sensitivity, a uniform analgesic regimen might lead to inadequate pain control in the CS group, thereby amplifying differences in pain relief outcomes. This makes it difficult to exclude the possibility that "inadequate analgesia", rather than "CS per se", influences prognosis. Research by Li Qian et al confirms that CS-related genes, such as NOS2, regulate pain conduction, necessitating tailored analgesic strategies.[4] Nijs et al also emphasize the critical impact of this interaction on outcome evaluation.[5] We suggest including relevant details or performing adjusted analyses to address this issue.

The study does not discuss the association between CS and postoperative radiological outcomes and lacks monitoring of inflammatory biomarkers, potentially limiting the comprehensiveness of its conclusions. The analysis does not examine the correlation between CS status and factors such as the quality of articular reduction or the progression of post-traumatic arthritis. If the CS group exhibits more significant structural damage radiographically, their poorer AOFAS scores and functional outcomes might be partially attributable to insufficient anatomical reduction rather than solely the effect of CS. This conflates the respective contributions of structural and functional factors to prognosis.[6] Furthermore, CS is closely linked to neuroimmune interactions, with persistent inflammatory responses being a core pathophysiological basis driving and maintaining CS. The absence of biomarker monitoring, eg, IL-6, TNF-α, weakens the mechanistic understanding of CS's impact.[7]

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The results section clearly indicates that the CS group demonstrated significantly greater preoperative-to-postoperative improvement in VAS, HADS-A, and HADS-D scores compared to the non-CS group. However, the abstract and conclusion sections uniformly state that the CS group exhibited "less improvement." This core conclusion directly contradicts the data presented, creating a logical inconsistency. We recommend revising the conclusion based on the data, clearly distinguishing between "poorer absolute postoperative scores" and "smaller improvement magnitude." It should be emphasized that while the CS group had poorer final scores, their clinical improvement was actually greater, potentially related to higher baseline levels and greater benefit from surgery. This adjustment would enhance internal consistency and make the conclusions more persuasive.

In conclusion, we commend the authors for addressing an important clinical question with a valuable study. To fully establish its clinical relevance, we have noted certain discrepancies in presentation and areas for potential supplementation. The aforementioned suggestions aim to further enhance the study's rigor and the completeness of its conclusions. We look forward to the authors' consideration of these points, as addressing these dimensions is crucial for meaningful clinical practice.

Abbreviation

CS, Central Sensitization.

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During the preparation of this work, the author(s) used DeepSeek-V3.2 in order to summarise the initial notes and to proofread the final draft. After using this tool, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

Disclosure

The author(s) report no conflicts of interest in this communication.

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