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Reliability of Fracture Neck of Femur Classification Systems – A Retrospective Study

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Abstract

Introduction Fractured neck of femur (NOF) is a common injury, and the majority occur in the elderly frail population. Classification systems are useful in helping guide management and determine prognosis, therefore having a reliable system is of clinical benefit. In the literature, two main classification systems exist for NOF, Garden and Pauwel's, but there is debate over which is more reliable. The aim of this study was to compare the reliability of Garden and Pauwel's classification systems for intra-capsular NOF.
Methods Two observers (A and B), both fourth year medical students, independently evaluated anteroposterior pelvis X-rays of patients with an intra-capsular NOF on two separate occasions, three weeks apart. Each X-ray was graded using both Garden and Pauwel's classification systems. The data was statistically analysed to determine the inter- and intra-observer reliability of each system through kappa (k) values and intra-class correlation coefficients.
Results Forty-five x-rays in total were analysed. Pauwel's classification showed greater interobserver reliability on both the first (k=0.56, p<0.001) and the second assessment (k=0.46, p<0.001) when compared to Garden (k=0.22, p=0.027 and k=0.33, p=0.002) respectively. Pauwel's demonstrated higher levels of intra-observer reliability for observer A (k=0.81, p<0.001) when compared to Garden (k=0.71, p<0.001). However, there was a negligible difference in intra-observer reliability for observer B, with values for Pauwel's and Gardens of k=0.47 (p=0.002) and k=0.46 (p<0.001) respectively.
Conclusions Pauwel's classification had higher inter-observer reliability and higher intra-observer reliability for observer A but there was negligible intra-observer difference between the systems for observer B. Pauwel's is a more reproducible system for use with intra-capsular NOF than Garden's classification.

Author statements

Conflicts of interest statement

No conflicts of interest have been declared by any authors.

Authorship statement

All authors fulfill ICMJE authorship criteria, which can be accessed at http://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html. All authors have read and approved the final version, and accept responsibility for information published.

Ethics statement

Authors declare that no ethical approval was required for this article.

Editorial and peer review statement

The review process for this manuscript was double blind, where authors and peer reviewers were blinded to each others identity and institution.

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