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Validation Of The Classification Of Forearm Shaft Fractures In The Swedish Fracture Register

Orthopaedics / Elbow & Forearm / Miscellaneous

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Background
The accuracy of data from National Quality Registers (NQR) requires regular validation to serve its purpose in scientific research. The Swedish Fracture Register (SFR) is an NQR registering fractures and treatment since 2011, with 100% national coverage among orthopaedic departments since 2021. Some fracture types registered in the SFR have been validated. The classification of forearm shaft fractures (FSF) has not yet been validated.

Objectives
This study aimed to assess the accuracy of the classification of the FSFs in adult patients registered in the SFR. A secondary aim was to investigate intra- and interrater agreement of the modified Arbeitsgemeinschaft für Ostheosynthesenfragen/Orthopaedic Trauma Association (AO/OTA) classification in the SFR.

Study Design & Methods
FSFs are classified according to a modified version of the 2007 AO/OTA classification comprising also Monteggia and Galeazzi fractures. Fractures are categorised into three types, A—C, depending on the pattern of the fracture, and further categorised into groups 1—3, depending on whether the ulna, radius, or both are affected.
Of the 130 randomly selected individuals, 122 had available radiographs suitable for validation. Three expert raters, blinded to patient and SFR data, independently classified the radiographs on two separate occasions. The raters agreed on a gold standard classification, which was then used to assess the accuracy of the fracture classifications registered in the SFR. Intra- and interater agreements between the experts were assessed as a measure of precision. The degree of agreement was assessed by calculating kappa values and interpreted in conformity with the guidelines of Landis and Koch, measured with kappa values ranging from 0.00 to 1.0.

Results
The accuracy of the classification recorded in the SFR vs the gold standard classification was moderate, kappa 0.56, for type and group. Interrater agreement was substantial to almost perfect, kappa 0.78—0.92. Intrarater agreement was substantial to almost perfect, kappa 0.70 — 0.82. The B fractures had the lowest accuracy, kappa 0.24, while A fractures had the highest, kappa 0.73.

Conclusions
The registration of FSFs reached a moderate level of accuracy for the modified FSF classification system

used in the SFR, compared with the gold standard classification. An almost perfect interrater agreement and substantial intrarater agreement suggest that the classification is understandable. The lower level of accuracy for the B-fractures warrants an update of the classification instructions within the SFR to include information on how to interpret wedge fragments.

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