



THE POSSIBILITY OF BONE FRACTURE PREDICTION IN OSTEOPOROSIS TREATMENT THROUGH THE USE OF AI

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Abstract

Osteoporosis is a progressive bone disease that is characterized by low bone mass and deterioration of a bone tissue. Patients with osteoporosis have higher risk of fractures, which is a primary complication of this disease. Early identification of individuals that have high risk of fracture, during osteoporosis treatment, is crucial for implementing timely interventions to mitigate fracture risk and prevent debilitating consequences. Artificial intelligence (AI) has emerged as a promising tool in predicting bone fractures in osteoporosis treatment. By employing machine learning algorithms and data analytics techniques, AI models can analyze a number of patient-specific factors, such as bone density measurements and scans, which are commonly used to assess a problem of interest. The aim of this work is to provide an overview of recent advancements in AI-driven prediction of bone fracture risk in osteoporosis treatment, and to consider the use of machine learning algorithms for estimation of the R-curve slope, toughness threshold and stress intensity factor, based on data such as patient's age and crack length that are collected during clinical examination. This work also highlights the challenges and opportunities associated with implementing AI-based fracture prediction models in clinical practice. The integration of AI-based fracture prediction tools into routine clinical care has the potential to improve osteoporosis management by enabling personalized risk assessment. By identifying individuals at heightened risk of fractures early in the treatment process, healthcare providers can tailor therapeutic strategies, optimize treatment efficacy, and improve patient outcomes.

Keywords: osteoporosis, fracture, prediction.

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