

The role of AI and machine learning in the detection of neurological disorders

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Track: Neurology and Mental Health

Theme: Treatment and Management of NCDs

ABSTRACT

Noncommunicable neurological disorders impose a growing national burden through delayed detection and variable care pathways. This plenary survey examines how artificial intelligence (AI) and machine learning (ML) can facilitate early detection and inform clinical decision-making in various conditions, including stroke, epilepsy, and movement disorders, among others. After an introduction to the core computational methods (vector-matrix models, gradients, and convolutional feature extraction), example evidence for AI-enabled triage is provided (e.g., hemorrhage and large-vessel-occlusion flags on CT/MRI), as well as seizure detection/prediction, gait and tremor analytics from wearables, etc. A summary of what AI can and should not do is also discussed. Practical deployment is framed as a clinical AI pipeline. Implementation guidance is also provided. Safety, governance, and equity are equally covered. The plenary is then concluded with future directions - multimodal and privacy-preserving learning, uncertainty-aware and causally informed models, and national collaborations - to translate trustworthy AI into measurable reductions in neurological NCD burden.

Keywords: Artificial intelligence (AI), Machine Learning (ML), Neurological Disorder Detection, Analytics, Clinical Decision Support