ISAKOS CONGRESS 2025 | MUNICH GERMANY June 8–11

Predictive Utility of the Machine Learning Algorithms in Predicting Tendinopathy: A Meta-analysis of Diagnostic Test Studies

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Faculty Disclosure Information

- No disclosures

Background

- Tendinopathy disease manifestation and prediction remains unclear
- AI and ML have shown to be useful tools in other branches of orthopaedics
- Proven models include convolutional neural networks, as well as random forest models.

Methods

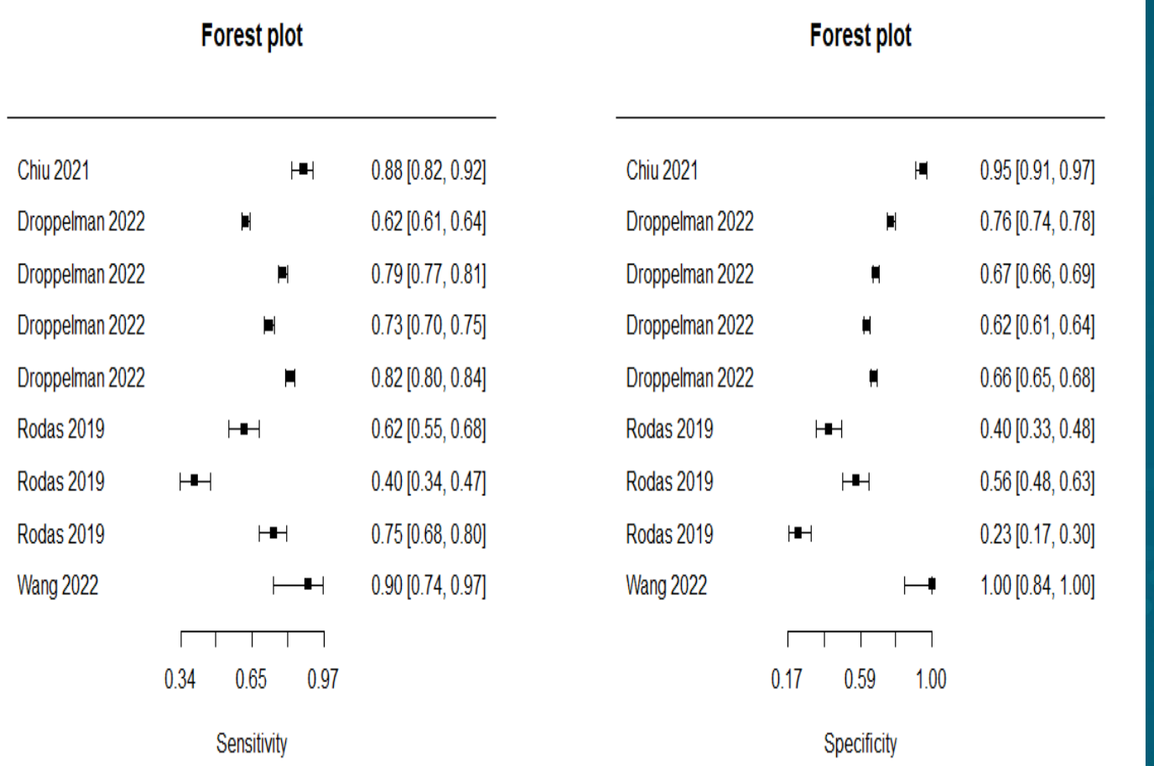
- Systematic review and meta-analysis
- All studies investigating AI/ML in predicting tendinopathy
- Different forms of tendinopathy analysed separately
- Statistical analysis using random effects logistic regression model

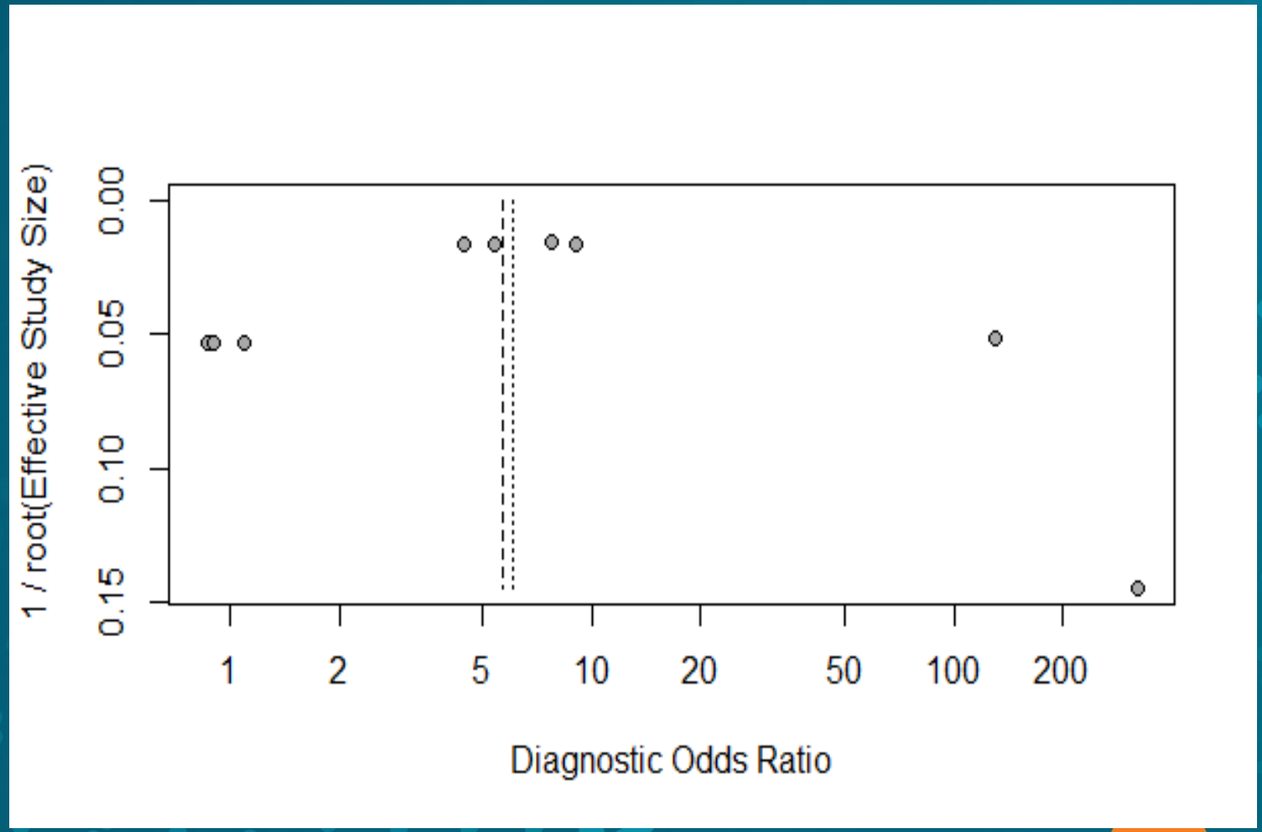
Results

- 4 studies met inclusion criteria
- 12611 patients
- Overall sensitivity of 0.74 (95% CI: 0.64 to 0.82, p=<0.001) and an overall specificity of 0.69 (95% CI: 0.49 to 0.85, p=0.06)).
- Diagnostic odds ratio (DOR) was 6.01 (95% CI: 1.8 to 20.13), with substantial heterogeneity (I2 = 97.6%).

Included studies

Author	Year	Country	Type of Algorithm	NOS
Chiu	2021	Taiwan	Convolutional neural network	8
Droppelman	2022	Chile	Random Forest	7
Rodas	2019	Spain	Support Vector Machine + Random Forest	7
Wang	2022	China	Random Forest + Support Vector Machine	8





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Conclusion

- ML methods can predict tendinopathy accurately in elite and non-elite athletes.
- Further research is needed to establish the specific clinical features associated with tendinopathy prevalence.

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