Diagnostic performance of Machine Learning based MR algorithm vs Conventional Images for predicting the likelihood of Brain Tumors

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Background: MRI forms an imperative part of the diagnostic and treatment protocol for both primary brain tumors and metastasis. Though conventional T1W MRI forms the basis for diagnosis at present, it faces several limitations. Machine learning algorithms require less expertise and provide better diagnostic accuracy. Objective- This systematic review and meta-analysis aimed to compare the diagnostic performance of conventional MRI v/s machine learning (ML) algorithms for brain tumors. Methodology- A Systematic Review of PubMed, Google Scholar and Cochrane databases along with registries (WHO ICTRP and clinical trials) through 1980-2021 was done. Original articles in English evaluating Conventional MRI or ML algorithms with/without usage of reference standard were included. Data was extracted by 2 independent reviewers and Meta-analysis was performed using bivariate regression model. Results – The study protocol was registered under PROSPERO (CRD42021289726). Twelve studies with 1247 participants were included for systematic analysis and three studies for meta-analysis. ML algorithms had better.
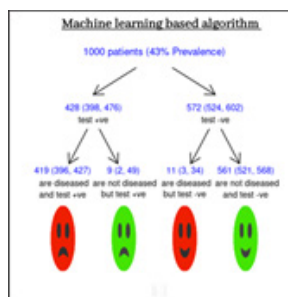

Figure: The sensitivity and specificity calculated machine learning based algorithms used for brain tumour segmentation.

Speaker Biography

Rama Alkhaldi is a second-year medical student at the Royal College of Surgeons in Ireland. She graduated valedictorian of her high school. Rama aspires to transform and ameliorate the quality of healthcare in Syria. Interests include cancer therapy, reproductive health, and regenerative medicine.

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