

# Identification of COVID-19 pneumonia changes on CT scan thorax: Comparison between deep learning module and radiologists' findings

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## ABSTRACT

**Introduction:** During the initial pandemic phase, rapid diagnosis of COVID-19 pneumonia is crucial for disease prevention and management. This study aimed to compare the deep learning (DL) module (AXIAL SkyMind version 1.0) and radiologists' findings in detecting COVID-19 pneumonia changes in CT-Thorax. **Methods:** A cross-sectional study from March to August 2021. 10 case studies HRCT thorax i.e. 9 studies confirmed COVID-19 pneumonia and a normal study. Patient IDs were removed and labelled by research series number. Data collected from their HRCT reports were standardized including their site and type of lesions (ground glass changes, consolidation and crazy-paving patterns) which were commonly found in COVID-19 pneumonia cases. Inter-observer agreement was measured using Fleiss Kappa (95% confidence interval). The radiologist's findings compared with the results generated by the DL module, Axial SkyMind version 1.0. **Results:** A total of 330 CT-scan reports by 33 trained radiologists analysed. We used 70% agreement among radiologists as significant findings. However, the DL module managed to detect and report ground glass changes only and could not identify consolidation and crazy-paving patterns. Comparing the radiologists' findings and DL modules on ground glass changes, the average percentage of agreement for the site was 72.5%, ranging from 0-100%. The severity of the ground glass changes was not detected by DL modules. **Conclusion:** There was significant differences between DL modules and radiologists' findings on HRCT Thorax of COVID-19 pneumonia. The DL module needs to be strengthened and improve its accuracy and reliability before the potential use in clinical practice.