Preliminary Results of Aidoc`S Deep Learning Algorithm Detection Accuracy for Pathological Intracranial Hyperdense Lesions.

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PURPOSE: To evaluate the specificity and sensitivity of Aidoc's deep learning technology in flagging pathological hyperdense intracranial lesions in non-contrast head CT (NCHCT).

METHOD AND MATERIALS: A dedicated computer aided (CAD) deep learning algorithm was designed for the detection of pathological intracranial hyperdense lesions (PIHL) on a NCHCT. This study is a retrospective review of consecutive NCHCT examinations in an emergency department of a single center during a week in April 2018. All examinations were reviewed and tagged for PIHL by a resident and a senior neuroradiologist. The results were matched with the outcome of Aidoc`s flagging. The sensitivity and specificity of CAD was compared with the gold standard - a senior neuroradiologist examination report.

RESULTS: Total of 160 cases were reviewed during a single week period. According to the ground truth, a total of 34 positive scans (21.2%) and 126 were negative (78.8%) were included. Three out of the 34 positive scans were not detected by the Aidoc solution, resulting in an overall sensitivity of 91.1% (CI: 0.76-0.98%, $P<0.05$). Out of 126 negative scans, 3 was flagged as a positive, resulting in an overall specificity of 97.6% (CI: 0.93-0.99%, $P<0.05$). Positive predictive value was 91.1 % (CI: 0.76-0.98%, $P<0.05$), while negative predictive value was calculated as 97.6 % (CI: 0.93-0.99%, $P<0.05$). Accuracy was 96.2% (CI: 0.92-0.98%, $P<0.05$).

CONCLUSION: Aidoc's deep learning technology demonstrated high accuracy in flagging PIHL. Integration of CAD for detection of hyperdense intracranial finding presents promising specificity and sensitivity.

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