Joint attention-based AI system helps detect autism

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A joint attention-based deep learning system provides good predictive

performance for differentiating autism spectrum disorder (ASD) from typical development (TD), according to a study published online May 25 in *JAMA Network Open*.

Chanyoung Ko, M.D., from the Yonsei University College of Medicine in Seoul, South Korea, and colleagues trained deep learning models to distinguish ASD from TD and to differentiate ASD symptom severities. Joint attention tasks were administered to children with and without ASD, and video data were obtained from multiple institutions. Ninety-five of 110 children completed study measures. The analytical population included 45 children with ASD and 50 with TD.

The researchers observed good predictive performance for the deep learning ASD versus TD model for initiation of joint attention (IJA; area under the receiver operating characteristic curve [AUROC], 99.6 percent; accuracy, 97.6 percent; precision, 95.5 percent; and recall, 99.2 percent); low-level response to joint attention (RJA; AUROC, 99.8 percent; accuracy, 98.8 percent; precision, 98.9 percent; and recall, 99.1 percent); and high-level RJA (AUROC, 99.5 percent; accuracy, 98.4 percent; precision, 98.8 percent; and recall, 98.6 percent). Reasonable predictive performance was seen for IJA, low-level RJA, and high-level RJA in the deep learning-based ASD symptom severity models.

"We believe our research opens possibilities for gathering large data sets on behavioral biomarkers through standardized video data acquisition setup amenable to computer vision and deep learning and applicable to a wide range of neuropsychiatric conditions," the authors write.

Two authors disclosed ties to LumanLab, and three disclosed having patents for the method and apparatus for diagnosis of developmental disability severity in toddlers based on joint attention.

  More information: Chanyoung Ko et al, Development and Validation

of a Joint Attention–Based Deep Learning System for Detection and Symptom Severity Assessment of Autism Spectrum Disorder, *JAMA Network Open* (2023). DOI: 10.1001/jamanetworkopen.2023.15174

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