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News Release

Meta-Analysis Shows Association Between Autism in Children and Cardiometabolic Diseases
Study Results Published by JAMA Pediatrics

A study conducted by the Centers for Disease Control and Prevention (CDC) from 2009 to 2017 determined that approximately 1 in 44 children ages 3-17 are diagnosed with some form of autism spectrum disorder (ASD). Research also has established that children with ASD have an increased risk of obesity, and obesity has been linked to increased risks for cardiometabolic disorders such as diabetes and dyslipidemia (high level of cholesterol or fat in the blood). However, the question of whether or not there is an association between autism, cardiometabolic disorders and obesity remains largely unanswered.

To help provide an insight into the possible ASD-cardiometabolic diseases link, Chanaka N. Kahathuduwa, M.D., Ph.D., and a collaborative team from Texas Tech University Health Sciences Center (TTUHSC) and Texas Tech University (TTU) conducted a systematic review and meta-analysis using the PubMed, Scopus, Web of Science, ProQuest, Embase and Ovid databases. Their study, "Association Between Autism Spectrum Disorders and Cardiometabolic Diseases: A Systematic Review and Meta-analysis," was published in January by JAMA Pediatrics, a journal of the American Medical Association.

Members of the collaborative team included Kahathuduwa, Chathurika S. Dhanasekara, M.D., Ph.D., Dominic Ancona, M-PAS, Leticia Cortes, M-PAS, Amy Hu, M-PAS and Christina Robohm-Leavitt, M-PAS, DMSc, from the TTUHSC School of Health Professions; Afrina H. Rimu, M.D., M.S., Drew Payne, D.O., and Sarah M. Wakefield, M.D., from the TTUHSC School of Medicine; and Ann M. Mastergeorge, Ph.D., from the TTU College of Human Sciences.

For Kahathuduwa, the seeds for the study were planted shortly after he received his Ph.D. in nutritional sciences with a focus on the neuroscience of obesity. Working as a research assistant professor under Mastergeorge, a nationally renowned ASD expert, he was invited by Naima Moustaid-Moussa, Ph.D., director of TTU's Obesity Research Cluster (now the Obesity Research Institute), to present a seminar discussing the neuroscience of obesity and autism.

"When I searched the literature to prepare my presentation, I realized that the evidence on the association between obesity and autism was quite ambiguous," Kahathuduwa recalled. "A solid meta-analysis was needed to address this gap."

That initial meta-analysis led Kahathuduwa to investigate further. He explored how neuroimaging may provide insight into relationships between ASD and obesity, the association between ASD and patients

who are underweight and the just-published study on autism and cardiometabolic risks. The studies accelerated after Dhanasekara, who focused on obesity and metabolic health to earn her Ph.D. in nutritional sciences, joined the collaboration.

In their latest meta-analysis, Kahathuduwa, Dhanasekara and their collaborators evaluated 34 studies that included 276,173 participants who were diagnosed with ASD and 7,733,306 who were not. The results indicated that ASD was associated with greater risks of developing diabetes overall, including both type 1 and type 2 diabetes.

The meta-analysis also determined that autism is associated with increased risks of dyslipidemia and heart disease, though there was no significant increased risk of hypertension and stroke associated with autism. However, meta-regression analyses revealed that children with autism were at a greater associated risk of developing diabetes and hypertension when compared with adults.

Kahathuduwa said the overall results demonstrate the associated increased risk of cardiometabolic diseases in ASD patients, which should prompt clinicians to more closely monitor these patients for potential contributors, including signs of cardiometabolic disease and their complications.

"We have established the associations between autism and obesity, as well as autism and cardiometabolic disease, including diabetes and dyslipidemia," Kahathuduwa said. "We don't have data to support a conclusion that autism is causing these metabolic derangements, but since we know that a child with autism is more likely to develop these metabolic complications and derangements down the road, I believe physicians should evaluate children with autism more vigilantly and maybe start screening them earlier than the usual."

Kahathuduwa also believes the study shows that physicians should think twice before prescribing medications such as olanzapine that are well known to have metabolic adverse effects to children with autism.

"Our findings should also be an eye opener for patients with autism and parents of kids with autism to simply be mindful about the higher risk of developing obesity and metabolic complications," Kahathuduwa added. "Then they can talk with their physicians about strategies to prevent obesity and metabolic disease."

Kahathuduwa said the next logical step for the collaborative team would be to generate evidence that either supports or rejects causality with regard to the observed associations.

"We have done some work with the ABIDE (Autism Brain Imaging Data Exchange) dataset regarding how neuroimaging shows the correlation between autism and obesity, but there is more work to be done," Kahathuduwa said. "None of these studies would have been possible without the help of the wonderful mentors, collaborators and students at both TTUHSC and TTU who contributed in numerous ways, and who will continue their important efforts to move these studies forward."

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