Medical research

Autism could be diagnosed with stool sample, scientists say

Researchers found differences in the gut microbes of autistic people, raising hopes for faster diagnosis

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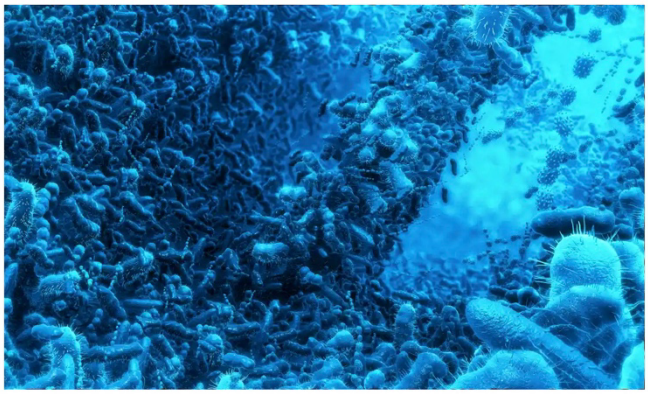

Electron microscope view of the human intestinal microbiome. Photograph: nopparit/Getty Images

Scientists have raised hopes for a cheap and simple test for autism after discovering consistent differences between the microbes found in the guts of autistic people and those without the condition.

The finding suggests that a routine stool sample test could help doctors identify autism early, meaning people would receive their diagnosis, and hopefully support, much faster than with the lengthy procedure used in clinics today.

“Usually it takes three to four years to make a confirmed diagnosis for suspected autism, with most children diagnosed at six years old,” Prof Qi Su at the Chinese University of Hong Kong said. “Our microbiome biomarker panel has a high performance in children under the age of four, which may help facilitate an early diagnosis.”

Rates of autism have soared in recent decades, largely because of greater awareness and a broadening of the criteria used to diagnose the condition. In the UK and many other western countries, about one in 100 people are now thought to be on the autism spectrum.

Studies in twins suggest that 60-90% of autism is down to genetics, but other factors contribute, such as older parents, birth complications and exposure to air pollution or particular pesticides in pregnancy. Signs of autism range from children not responding to their name and avoiding eye contact, to adults who find it difficult to understand what neurotypical people are thinking and getting anxious if their daily routine is disrupted.

Scientists have long known that autistic people tend to have less varied bacteria living in their digestive system, but whether this is due to autism in some way, or actually contributes to the condition, is a matter for debate.

To delve deeper into the puzzle, Su and his colleagues analysed stool samples from 1,627 children aged one to 13, some of whom were autistic. They checked the samples to see which bacteria were present, and did the same for viruses, fungi and other microbes called archaea.

Writing in Nature Microbiology, the researchers describe how gut microbes differed markedly in children with and without autism. In all, 51 types of bacteria, 18 viruses, 14 archaea, seven fungi, and a dozen metabolic pathways, were altered in autistic children. Armed with machine learning, a form of artificial intelligence, the scientists were able to identify the autistic children with up to 82% accuracy, based on 31 microbes and biological functions in the digestive system.

The study revealed other changes too, with various metabolic pathways involved in energy and neurodevelopment apparently disrupted in the autistic children.

“While genetic factors play a substantial role in autism, the microbiome could act as a contributing factor by modulating immune responses, neurotransmitter production, and metabolic pathways,” Su said. “This does not necessarily imply causation, but suggests that the microbiome might influence the severity or expression of autism spectrum symptoms.”

If the researchers’ thinking is correct, and disruption to the microbiome does affect the severity of autism, it raises the prospect of personalised interventions that use diet or live bacteria known as probiotics to establish a more diverse microbiome in those diagnosed with the condition.

“Ultimately, this broad scope increases the potential to develop more effective, noninvasive diagnostic tools and therapeutic strategies for autism,” Su said.

The team is now running a clinical trial to investigate whether stool samples can help to identify autistic children as young as one year old.

Dr Dominic Farsi at King's College London said the results could have "great potential" in diagnostic practice, but added that more research was needed to confirm the findings. "Notwithstanding, these results could represent a big step towards enhancing diagnostic methods for autism spectrum disorder," he said.

Dr Elizabeth Lund, an independent consultant in nutrition and gastrointestinal health, said: "The idea that analysis of stool samples may aid in diagnosis is very exciting, as currently there is a massive backlog in children and adults waiting to be assessed. The current process is very lengthy and there is a shortage of clinicians such as psychologists and psychiatrists trained to carry out a proper diagnosis.

"Clearly the study needs to be repeated by other groups and in other populations around the world, but the approach might offer a novel and more automated route to diagnosis in the longer term."

https://www.theguardian.com/science/article/2024/jul/08/autism-could-be-diagnosed-with-stool-sample-microbes-research

I think any savvy observer of the "mental health" and autism literature has come to suspect that the "gut biome" is the source of much of human health differences. Whether the gut biome is the cause of those differences or just one more "symptom" from a more basic disorder might be unclear, but I think we need to examine hard whether changing that biome can change mental health outcomes like depression, and maybe autism too.

Again, the antivaxxers who have insisted "vaccination causes autism" have pinpointed gastrointestinal disruption as the likely route. The mother who looked into the camera and said flatly "My son was different immediately after vaccination" needed no lab test to make the connection clear to her. That vaccines do not do such things to the vast majority of recipients does not disprove that in very rare cases they can. The threat to vaccination made the campaign against its detractors and accusers merciless. Antivaxxers tend to misconstrue things, and I think vaccine defenders have not been entirely honest either.

We need vaccines and public health campaigns for vaccination, and can submit to them because the risks are minimal, however much antivaxxers insist otherwise and vaccine proponents downplay them. Public health initiatives tend to doubt the public can be trusted with the full, nuanced, complicated truth, and thereby, in their obfuscations and "veridical" failures, sow the seeds that produce distrust and backlash. TJB