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Autism spectrum disorder (ASD) is a challenging neurological condition characterized by difficulty with social interaction and communication. As the name implies, it occurs across a wide spectrum from barely detectable to debilitating. ASD is usually diagnosed by 3 years old, but studies have found that signs are often present as early as six months old.

It is understandable that parents of children with ASD are eager for effective treatments and feel obligated to do their best for their children by leaving no stone unturned. This is not, however, always the best approach in medicine. Some stones can cause harm and are best left unturned.

There is a cottage industry of so-called "biomedical" treatments for ASD - they treat ASD as a biological disease that can be cured or at least significantly ameliorated. This conflicts with the current scientific consensus regarding ASD, that it is a neurodevelopmental disorder (a result of brain wiring), and not an active disease. Legitimate interventions focus on improving function. Critics of biomedical treatments (myself included) argue that such treatments are unscientific, exploit parental desperation, and even victimize children with ASD.

A recent systematic review looks at one popular biomedical treatment for ASD, chelation therapy. The idea here is that autism is caused by, or significantly worsened by, the presence of toxic heavy metals, such as mercury, in the body. This is often tied to the claim that vaccines are the source of the heavy metal poisoning and therefore are linked to autism (a claim that has been soundly refuted by the evidence).

Chelation therapy is a legitimate treatment for real heavy metal poisoning. Chelating agents can be given orally or intravenously, they bind to heavy metals and help the body excrete them. In this regard they work well - after receiving chelating agents the body will excrete heavy metals.

Chelation therapy, however, has been a popular target for the fringe. For decades a persistent but tiny minority of physicians have believed that chelation therapy is an effective treatment for vascular disease, despite the fact that the evidence has refuted this claim on both basic science and clinical grounds.

One has to wonder if the fact that chelation therapy is an expensive procedure and has to be given multiple times is a factor in its popularity on the fringe.

In any case - at best chelation therapy can be considered experimental for autism. This raises issues regarding the ethics of giving experimental treatments, ethics which have been thoroughly explored.

First, experimental treatments should not be offered instead of proven therapies. In other words, they are not a justification for withholding standard of care treatment. In cases where such treatments are not available or insufficient, however, resorting to experimental treatments is reasonable.

Experimental treatments, however, should be reasonably justified by existing evidence. There should be good reason to believe that such treatments are likely to be safe and effective, often stated as - they are more likely to produce benefit than harm.

When researchers are applying for grants and permission to perform human medical experimentation, they have to provide data to support this conclusion. If they cannot do so, then the experiment is considered unethical and likely will not get approved. The threshold does vary depending on the situation. For terminal illnesses without effective treatment we are willing to dip deeper into speculative treatments (so-called "compassionate" use).

It is also generally accepted that experimental treatments should be given, whenever possible, in the context of a clinical study, so that we can learn whether or not the treatment is effective. This also assures that proper informed consent will be given, and further means that patients will be given proper follow up and will not be charged for experimental treatments.

In every regard chelation therapy for ASD fails. The treatment is based on the hypothesis that heavy metal poisoning causes or contributes significantly to ASD. The evidence does not support this conclusion; however, and in fact it is reasonable to say that this hypothesis has already been rejected by existing evidence. Further it is often given outside of the context of a proper clinical trial.

The new systematic review looks at five clinical studies of the effectiveness of chelation therapy for ASD. They found that four of the five studies had mixed results, while the fifth had positive results. All the studies, however, suffered from fatal methodological flaws (they were weak, poorly designed studies), and therefore collectively they do not provide evidence to support the use of chelation therapy for ASD.

Despite this, about 7% of parents of children with ASD have tried chelation therapy. The review also warns that chelation therapy is not without direct risk. The lead author is quoted as saying :

"The chemical substances used in chelation treatment have a myriad of potentially serious side effects such as fever, vomiting, hypertension, hypotension, cardiac arrhythmias and hypocalcaemia, which can cause cardiac arrest," said Tonya N. Davis, Ph.D., assistant professor of educational psychology in Baylor's School of Education and co-author of the study.

Conclusion

Offering chelation therapy for ASD is a basic violation of medical ethics. If the treatment is considered experimental (which is generous) then it should only be given as part of a well-designed clinical trial. Existing trials, however, are anything but well designed.

But calling chelation therapy for ASD experimental gives it more credit than it deserves. It is not even speculative. There is evidence to suggest that the basic premise of chelation for ASD is wrong. Giving chelation for ASD is therefore not really an example of putting the cart before the horse, but putting the cart before the unicorn.

It is therefore not only unacceptable to give chelation for ASD, it is also unethical to even perform a clinical trial of chelation for ASD - the basic science justification is simply not there.

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