

Unraveling autism: The pseudo-epidemic

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Abstract

As we enter the modern age, more people are becoming educated on autism thanks to informational outlets that spread awareness. Until the 1980s, many autistic individuals were institutionalized as autism was even less socially desirable at that time than it is now. Society rendered autistic people invisible and unnecessary, falsely believing that they inhibited social progress and were only a burden to their respective communities. The deinstitutionalization movement that sprang as a result led more people to be diagnosed with autism instead of what was deemed mental retardation. More autism diagnoses led to more money being dedicated to therapy and research, which in turn led to more diagnoses. Aside from research, a greater awareness in general allows for more autism symptoms to be recognized. This article is an attempt to give a brief overview of the misconceptions about autism and to bring forth the scientific background of this developmental disorder.

Commentary

Findings from the Global Burden of Disease (GBD) show that 4.57 million people under the age of 5 are living with autism, which is about 1 in 138 kids. Globally, autism rates are at an all time high. Statistics report that developing, low-income, and middle-income countries are home to the largest population of autistic children. There are over one million autistic children each in South Asia and Sub-Saharan Africa, and the highest rates of childhood autism are seen in the Middle East, Central Asia, and North Africa. India has 851,000 autistic children, which is the largest number of any country. Following India is Nigeria with 207,000, then Pakistan with 172,000, and Indonesia with 159,000. These regions present with low vaccination rates, further refuting the claim that vaccines cause autism [1]. However, the cause is not that more autistic children are being born. So why are autism rates rising? It seems that the rise in autism rates is largely social, not biological. Multifaceted sociological and political factors are increasing the diagnoses and documentation of autism.

According to the CDC, 1 in 44 children in the United States have autism. This is a dramatic increase from the 1 in 54 in 2016 and the 1 in 150 in 2000 [2]. But to clarify, there is no autism epidemic. The word “epidemic” itself has a negative denotation, its definition relating to the spread of an infectious disease. Autism is most definitely not an infectious disease; this tone-deaf term refers to the increasing autism rates not just in the United States, but globally. Anti-vax propagandists attribute this apparent rise of autism to the increasing vaccination rates amidst the COVID-19 pandemic, despite a lack of evidence to support this claim. Others accredited it to the rising age of parents, which has a weak correlation.

There is an enduring question that presents itself while studying psychology: the argument of nature versus nurture. What factors actually cause a condition? Are they biological or social? It also applies to autism spectrum disorder (ASD). Is autism attributed to genetics or the environment? The answer is actually both.

Let's first examine the biological, specifically genetic, components of ASD. Research has been done on specific genes that may lead to autism

if mutated, such as ACTL6B. In RNA-binding proteins, mutations that disrupt binding sites may also contribute to autism; these include missense mutations, where a single amino acid is different, or nonsense, where an amino acid acts as a stop codon and makes the protein too short. Both of these are due to point mutations in the DNA [3].

Neuroscience explains the effect of mutations on brain development. Differentiating between an autistic brain and a non-autistic brain is challenging; therefore, imaging techniques are not primarily a diagnostic aid. The changes in the brain are subtle and mostly seen in the average across many individuals. The normal differences from person to person exist and are much more dramatic than the subtle systematic changes expressed with autism.

The right and left hemispheres of the brain communicate and send signals between each other to facilitate function. In an autistic brain, there is some difficulty in the communication between the two hemispheres, with not as many strong connections [4]. Furthermore, scientists have recently found that ASD brains have slightly more symmetry than non-ASD brains. How this symmetry plays into autism traits is still being researched, but there is a popular theory concerning the lateralization of the brain. Left-right asymmetry is an important aspect of brain organization as certain functions pertain to a specific hemisphere; the left brain is more responsible for language and reasoning while the right brain concerns creativity and spatial skills. The reduced leftward language lateralization in autistic individuals explains their higher rate of left-handedness compared to the general population [5].

Atop the four lobes of the brain lies the cerebral cortex, a thin layer of gray matter, which is the area of information processing. Greater

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surface area of the cerebral cortex due to the folds in the brain allows for more information processing. Gray matter ripples in peaks called gyri and troughs called sulci respectively, but in autistic brains, the gyri and sulci may develop differently. Significantly more folding in the left parietal and temporal lobes, as well as the right frontal and temporal lobes, is seen with ASD [6]. During development, the gradual merging of cortical regions results in gyri formation in between them. Hypoconnectivity in the autistic brain allows weakly connected regions to drift apart and form sulci between them [7]. The deeper these sulcal pits are, the more language production is affected [8]. Even the tiniest difference in the folds can present itself differently in terms of cognition skills, demonstrating the true breadth of the spectrum.

Correlation does not equal causation. This is something that the general population seems to misunderstand. Many believe that if B follows A, then A must be the cause of B. Let's say that A is the vaccine and B is an autism diagnosis. If you get vaccinated and are soon after diagnosed with autism, then the vaccine must have caused you to develop autism. Right? Wrong.

Where did this absurd myth originate? The MMR vaccine, which is for mumps, measles, and rubella, is administered to 12 to 18 month old children [9]. This is also the usual age for signs of developmental disorders like autism to begin showing. Therefore, many people mistakenly believed, and still believe, that MMR vaccines cause autism.

In 1998, Andrew Wakefield, a London physician, was conducting studies with the MMR vaccine and found that apparently normal children manifested "autistic" symptoms after being administered the vaccine. He hypothesized that the measles virus in the vaccine triggered inflammatory lesions in the colon so that it was no longer permeable to neurotoxic proteins that had to reach the brain; these proteins were necessary for healthy brain function and thus, the lack of them led the children to develop autism. Surprisingly, nobody publicly questioned Wakefield's ideas at the time despite the irrational logic that this precise biological origin could lead to such a diverse spectrum, a spectrum that he clearly didn't account for. If Wakefield's logic was correct, then why are some autistic people nonverbal and others find social interaction unchallenging? [10]

Another theory involved a component of the vaccine vials: thimerosal, an antiseptic that combines ethyl-mercury and thiosalicylate. The large amounts of mercury that are dumped in the ocean can cause central nervous system (CNS) damage to shellfish and humans. As autism is a CNS condition, people concluded that the mercury in vaccine vials was responsible for inducing autism. In reality, the extent of the mercury found in oceans compared to the minimal amount used in vaccines is incomparable [11].

A 2015 JAMA study analyzed the health records of over 95,000 children, 2,000 of whom were classified as "at risk" for autism due to having an autistic sibling. This study found that the MMR vaccine does not increase the risk for autism spectrum disorder, even for those classified as "at risk". These results concur with other studies, refuting the claim that vaccines increase the risk for autism disorder [12,13].

Despite the correlation to autism, vaccines have always garnered skepticism in regards to infants' immune systems being too weak to handle vaccines, since live virus vaccines like MMR contain a weakened version of the virus or bacteria that they target.

Take-home message

The most important thing to remember is that this so-called epidemic poses no threat to humanity. Autism is not something to fear, but rather something unique that should be accepted and celebrated for what it is. There is no dangerous poison in vaccines that is causing more autistic children to be birthed. Rather, the advancements in education and research are allowing people to better understand autism and how to properly diagnose it, though subjectivity still remains. Don't trust conjectural conspiracies over scientific evidence.

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