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A DIFFERENT VIEW

Is autism reversible?

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INTRODUCTION

Autism is a neurodevelopmental disorder characterized by limited ability to interact and communicate with others (1). Autism affects all races, ethnic groups and socioeconomic levels, with males experiencing this disorder 2 to 6.5 times more commonly than females (1). More recently, autism is referred to as 'autism spectrum disorder' (ASD), as afflicted individuals manifest varied signs and symptoms and with differing severity. Some people with milder forms of autism are able to function, while others with severe forms of the disorder are completely disabled. Although the *American Academy of Pediatrics* (AAP) has concluded that 'ASDs, similar to other neurodevelopmental disabilities, are generally not 'curable' and chronic management is required' (2), this paper respectfully proposes the viewpoint that some cases (not all) of autism are, in fact, reversible.

Recent literature suggests that the incidence of autism has climbed by over 1500% in <20 years from a rate of around 1:2500 in the mid 1980s to a rate of 1:150 by 2002 (3)—with reported rates as high as 1:94 in some areas of America (1). Hypothetically, a 20% increase in cancer or 25% increase in heart disease might provoke clamour for an explanation; the colossal rise in autism, however, is sometimes passed off as incidental. Although many believe the ASD escalation represents better and earlier diagnosis, improved public awareness and expanding criteria to fulfil the diagnosis, these changes do not appear to adequately account for the rapid rise (4).

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It is possible that some of the escalating prevalence of ASD reflects an escalating prevalence of one or more causative determinants. Accordingly, to reverse the rising incidence in population groups, it is necessary to identify and diminish the prevalence of such determinants. To reverse ASD within an individual, it is necessary to reverse the cause within that person if possible.

WHAT WE KNOW ABOUT THE AETIOLOGICAL ORIGINS OF AUTISM

At a fundamental level, all illnesses, including ASD, commence because of causative factors, illnesses persist because causative factors persist and illnesses may be cured when such causative factors are addressed. Although manifestations of any disease including developmental disorders may be mitigated by interventions such as medications, physical therapies, behavioural skills, or surgery, sustained 'cure' depends on addressing causative determinants. Accordingly, dramatic and continued reversibility of autism can only occur when aetiological factors are removed or severely reduced.

Multifactorial causation

A diagnosis of ASD does not implicate identical causation in all afflicted people—the AAP recently concluded: 'the aetiology is multifactorial' (1). Autism is a syndromic diagnosis entirely based on a constellation of common manifestations. Indicators of ASD, such as developmental delay, communicative dysfunction or behavioural problems are merely manifestations of brain dysfunction resulting from disordered neurobiology. Just as shortness of breath can be the common presenting feature of distinct causes including asthma, heart failure, allergy, or emphysema, the manifest brain dysfunction of autism appears to represent a common expression of potentially differing aetiologies.

Environment as a determinant

According to the Centers for Disease Control and a plethora of emerging research, 'virtually all human diseases result from the interaction of genetic susceptibility and modifiable environmental factors' (5). While genetic factors predisposing to ASD have been explored and reported (1,6), widespread spontaneous mutation of genetic material over the last two decades is unlikely. Perhaps some of the recent rise of ASD reflects increasing exposure to ubiquitous environmental determinants (7). The AAP concurs: 'the expression of the autism gene(s) may be influenced by environmental factors' (1). Furthermore, as autism is usually manifested by age 3, causative factors are at play during the prenatal period or early years.

Specific potential determinants

Broadly speaking, environmental influences fall into two categories, i) lack of required elements thus precluding normal physiology, and ii) toxic elements, which obstruct normal function (8). The child with ASD might have a nutritional deficiency (3); or have previous exposure to, or ongoing evidence of chemical toxicants (9), infectious agents (10), physical exposures such as electromagnetic harm (11), psychological stressors, or an antigen evoking hypersensitivity. With such early onset of illness, psychological factors are unlikely primary aetiological determinants.

EVIDENCE FOR REVERSIBILITY OF AUTISM

Despite a plethora of anecdotal claims from parents, health practitioners and autism groups about the benefits of assorted interventions, insufficient carefully-designed, high-quality randomized controlled trials have assessed the swelling repertoire of purported ASD interventions (2). Nonetheless, some recent publications report promising ASD outcomes.

Fluctuations in the severity of a child's autistic behaviours suggest that biochemical processes involved in the disordered neurobiology might be susceptible to various influences. For example, 'fever-induced reversibility' of ASD manifestations has been attributed to reversible dysregulation of neurons in the brain stem (12).

Various nutritional interventions including supplemental essential fatty acids and folate have been reported to improve significantly the status of some ASD children (13,14). Nutritional therapies in combination with environmental trigger avoidance, detoxification of heavy metals and behavioural therapy have also been reported to reverse some ASD manifestations (15) – it is impossible to discern what might have contributed most to improvement. And finally, a recent case history discusses the sustained recovery of a severely autistic child after micronutrient evaluation confirmed specific deficiencies related to celiac disease, and missing nutrients were repleted (3).

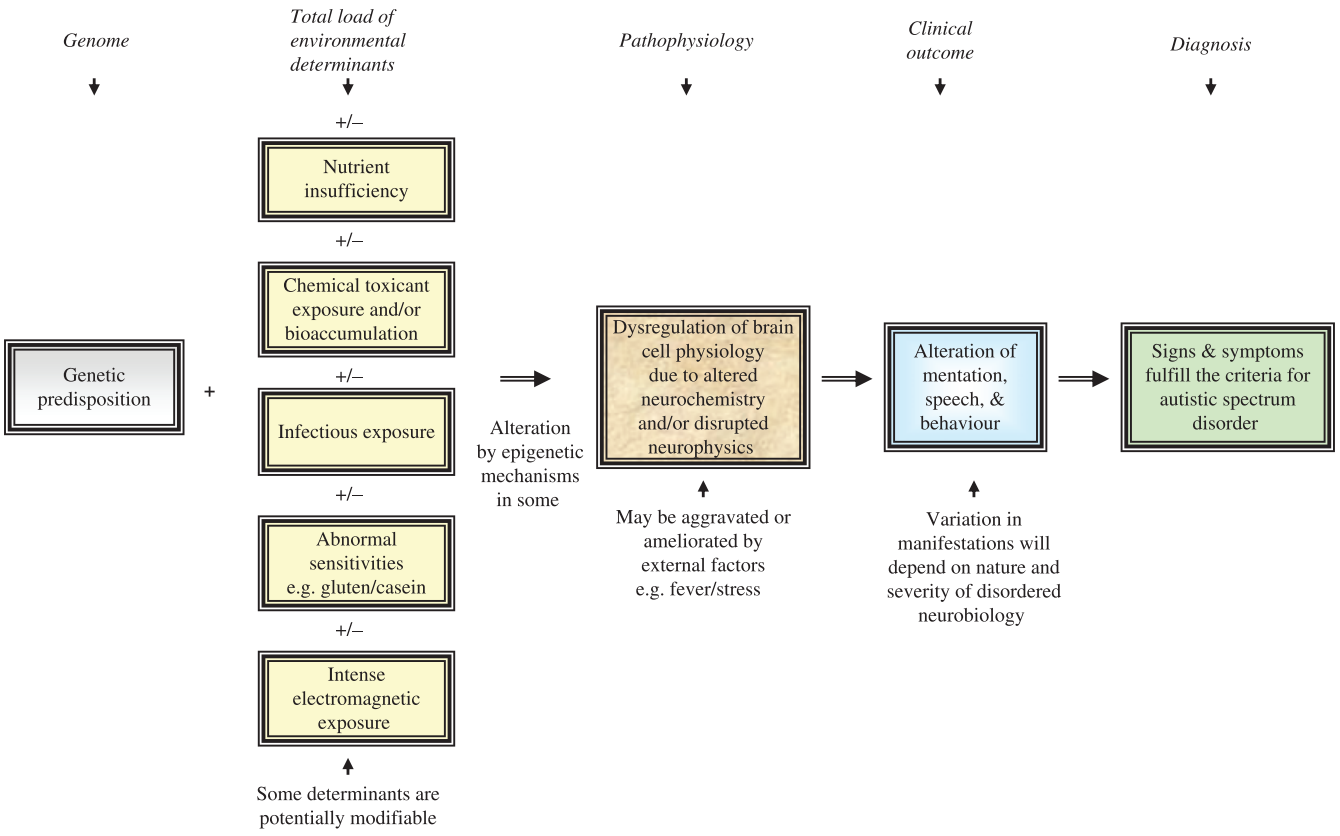

Figure 1 Proposed pathogenesis of autistic spectrum disorders.

POTENTIAL PATHWAY TO AUTISM AND BACK

Just like respiration or digestion, social sensitivity probably has biochemical substrates. Dysregulation of biochemical pathways required to carry out biological brain functions has the potential to result in neuropsychiatric syndromes like autism. Accordingly (as illustrated in Fig. 1) ASD appears to represent the outcome of the interface between a susceptible genome interacting with the total load of cumulative adverse environmental determinants. This complex interaction may result in disordered neurobiology and consequent disease indicators. Reports document, however, that such autistic manifestations can sometimes be reduced and even reversed if the source of the disordered neurobiology is explored and addressed.

The amount of brain dysregulation that can be reversed will depend on i) the total load of ASD influences, and ii) modifiability. The pathogenetic mechanism of environmental determinants may vary – including epigenetic change (16), teratogenic damage (17), cytotoxic and genotoxic impact, endocrine disruption, immune dysregulation and other types of metabolic impairment. Accordingly, it is not possible in advance to precisely predict whether neuropathology will be reversible. Correcting modifiable determinants when possible, however, may ameliorate brain neurobiology in some cases, potentially resulting in ASD reversal. Reversibility for one ASD child, however, does not translate into reversibility for all with this diagnosis.

The celiac example and gastrointestinal symptoms

The prevalence of celiac disease appears to be elevated in populations of children with ASD (18,19) – the latter perhaps resulting from nutritional deficiency associated with gluten intolerance and consequent malabsorption (3). Various reports suggest that gluten-free and casein-free diets have occasionally reduced symptoms in autistic children (3,20,21). Thus, it seems eminently reasonable to search for modifiable contributors to ASD manifestations and to explore therapeutic programmes that eliminate or reduce changeable environmental determinants.

Exclusive of celiac disease, however, much debate surrounds the possibility of a link between gastrointestinal (GI) disease and autism, with discussion about the prospect of a 'unique GI lesion' in ASD afflicted individuals (22). As the path to autism seems to be multifactorial as portrayed in Figure 1, there may be a subset of ASD children with GI symptoms and others without–depending on whether the causative determinants may also impact GI function. Looking for consistent GI symptoms across the spectrum of all ASD patients is not likely to be fruitful (23).

CONCLUDING THOUGHTS

The AAP has stated that 'It is important that paediatricians …have a strategy for assessing [ASD patients] systematically' (1). The current approach to autism involves meticulous assessment to confirm fulfilment of ASD criteria followed by therapies to optimize functioning. Potential aetiologies of illness with individual patients are frequently unexplored. Searching for underlying influences, however, might identify reversible contributors to ASD occurrence.

Micronutrient testing, for example, is objective, inexpensive, non-invasive, and the potential reward is high (3). The paediatric community should consider a recommendation that all children with pervasive developmental difficulties have a thorough nutritional assessment. The limiting feature is that most physicians are untrained in detailed assessment and management of disordered nutritional biochemistry, a widespread flaw in contemporary medical education (24).

Frustrated and disillusioned, a significant percentage of parents with ASD children turn to complementary health practitioners after receiving a diagnosis of autism from the paediatrician (25). This situation sometimes leads the physician to feel a sense of betrayal and may result in ongoing tension in the relationship between the paediatrician and the family. A demonstrated willingness to assess for determinants of autism would go a long way in maximizing the relationship between doctor, patient and family. Investigating the aetiological origins of a diagnosis is not 'alternative medicine'–investing the time and effort required to explore all potential influences of disordered neurobiology in patients with chronic disabling neuropsychiatric illness such as ASD is a fundamental component of comprehensive scientific medical practice.

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CONFLICT OF INTERESTS

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