

Expression of Autism Spectrum Disorder in Twins

Hanna Marshal*

Department of Genetic Engineering, University of Debrecen, Debrecen, Hungary

DESCRIPTION

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition characterized by a range of challenges in social interaction, communication, and repetitive behaviors. While the exact causes of ASD remain elusive, there is growing evidence to suggest that genetic factors play a significant role in its development. This becomes particularly intriguing when examining twins, as it provides a unique opportunity to explore the interplay between genetics and environmental influences. This article examines into the complexities of ASD in twins, discovering the genetic basis, environmental factors, and the interrelationship that contributes to the manifestation of this spectrum disorder.

The genetic basis of Autism Spectrum Disorder (ASD)

Studies over the past decade have consistently indicated a strong genetic component in the development of ASD. Twins, with their shared genetic makeup, offer a valuable lens through which researchers can study the heritability of ASD. Identical twins, also known as Monozygotic (MZ) twins, share nearly 100% of their genes, while fraternal twins, or Dizygotic (DZ) twins, share around 50% of their genes, similar to non-twin siblings. Research involving twins concurs that if one identical twin has ASD, the likelihood of the other twin also being diagnosed with ASD is significantly higher compared to fraternal twins. This higher concordance rate in identical twins strongly suggests a genetic predisposition. However, it's important to note that genetics alone cannot explain the entire picture.

Shared and non-shared environments

While genetic factors provide a foundational understanding of ASD in twins, it's equally crucial to consider the role of environmental factors. The environment in which twins grow and develop can be either shared or non-shared. Shared environmental factors include experiences and influences that affect both twins, such as prenatal conditions, family environment, and early childhood experiences. Non-shared environmental factors, on the other hand, are unique to each

individual twin and may include distinct life experiences, relationships, or exposure to different environmental stimuli. Researchers studying twins with ASD have observed instances where one twin is diagnosed while the other is not, despite sharing the same genetic predisposition. This phenomenon underscores the intricate interplay between genetic and environmental factors in the development of ASD. Identical twins who share the same genetic makeup may still experience differences in their environments, leading to variations in the manifestation of ASD traits.

Epigenetics and gene-environment interactions

The field of epigenetics further deepens our understanding of the interplay between genes and the environment. Epigenetic mechanisms involve modifications to the DNA molecule that can influence gene expression without altering the underlying genetic code. Environmental factors, such as prenatal exposures or early childhood experiences, can trigger epigenetic changes that may contribute to the development of ASD. In the context of twins, the study of epigenetics allows researchers to explore how identical genetic material can lead to divergent outcomes. Epigenetic modifications can result in differences in gene expression between identical twins, even though their DNA sequences are nearly identical. This adds another layer of complexity to the understanding of how genes and the environment interact to shape the development of ASD in twins.

Subtypes of autism and heterogeneity in twins

ASD is not a monolithic condition but rather a spectrum with considerable heterogeneity. The diverse ways in which ASD presents itself, often referred to as subtypes, highlight the complexity of the disorder. Some individuals with ASD may have exceptional abilities in certain areas, while others may experience significant challenges in multiple domains. In twins, the heterogeneity of ASD becomes apparent when considering cases where one twin is diagnosed with ASD while the other is not. The existence of subtypes within the spectrum suggests that genetic and environmental factors may interact in unique ways, contributing to the variability observed in twin pairs. Understanding these subtypes and the factors that contribute to

Correspondence to: Hanna Marshal, Department of Genetic Engineering, University of Debrecen, Debrecen, Hungary, E-mail: marshalh@yahoo.com

Received: 04-Sep-2023, Manuscript No. MAGE-23-28090; **Editor assigned:** 07-Sep-2023, Pre QC No. MAGE-23-28090 (PQ); **Reviewed:** 21-Sep-2023, QC No. MAGE-23-28090; **Revised:** 28-Sep-2023, Manuscript No. MAGE-23-28090 (R); **Published:** 05-Oct-2023. DOI: 10.35248/2169-0111.23.12.245

Citation: Marshal H (2023) Expression of Autism Spectrum Disorder in Twins. Advac Genet Eng. 12:245.

Copyright: © 2023 Marshal H. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

them is crucial for tailoring interventions and support to the specific needs of individuals with ASD.

Implications for early intervention and support

Studying ASD in twins not only contributes to our understanding of the disorder's origins but also has important implications for early intervention and support. Identifying genetic and environmental factors that contribute to ASD can aid in the development of targeted interventions and personalized treatment plans. Early detection and intervention

are crucial for maximizing positive outcomes and supporting individuals with ASD in reaching their full potential. For twins where one sibling has been diagnosed with ASD, close monitoring and early intervention for the other twin may be recommended. This proactive approach acknowledges the potential shared genetic vulnerability while recognizing the influence of individual environmental factors. Early interventions, such as behavioral therapies and educational support, can play a vital role in mitigating the impact of ASD and promoting positive developmental trajectories.