



Original Research

Prenatal Risk Factors for Autism: a selected school-based study in Dhaka, Bangladesh

Prenatal risk factors of autism

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Abstract:

The incidence of autism spectrum disorder (ASD) is on the rise worldwide, but research on the risk factors of ASD in Bangladesh is limited. Several studies have shown a connection between prenatal complications and an increased risk of ASD. This study aimed to assess the prenatal risk factors associated with ASD by analyzing medical records and parent questionnaires from 72 individuals diagnosed with ASD. The findings revealed that certain prenatal risk factors, such as erythroblastosis, fetal anoxia, gestational diabetes, intrauterine growth problems, diabetes mellitus, epilepsy, cousin marriage, genetic disorders, and thyroid abnormalities, were associated with ASD. However, advanced maternal and paternal age were not identified as the primary causative factors for ASD in this study. A small number of parents had more than one child with autism. Male individuals were more affected by ASD compared to females, and the majority of cases were diagnosed during the preschool years, specifically between the ages of 5 and 10. In conclusion, specific prenatal factors were found to be directly involved as risk factors for ASD. These findings emphasize the need for further investigation into these specific prenatal risk factors and their potential mechanisms of influence on ASD.

Key words: Autism Spectrum Disorder, Prenatal, Risk Factors,

Introduction:

Autism Spectrum Disorders (ASD) is a group of neurodevelopmental disorders that exhibit challenges in social interaction, deficits in communication, and the presence of restricted and repetitive behaviors. (Mamidala et al., 2013). The current prevalence rate of autism spectrum disorder (ASD) is estimated to be approximately

1%, which has progressively increased in the last two decades (Bertrand et al., 2008; (Hawladar et al., 2020). While genetic factors have been extensively studied, recent research suggests that prenatal risk factors may also contribute to the development of ASD (Chien et al., 2019). Investigating these risk factors is crucial for early

identification, intervention, and the formulation of preventive measures. Multiple studies have explored various prenatal risk factors associated with ASD (Froehlich-Santino et al., 2014). One prominent area of research focuses on maternal health and pregnancy-related conditions. Maternal factors, such as advanced maternal age, maternal infections, and maternal autoimmune disorders, have been implicated as potential contributors to the development of ASD in offspring (Gardener et al., 2011; Atladóttir et al., 2012; Brown et al., 2014). Additionally, prenatal exposure to certain medications, such as valproic acid and selective serotonin reuptake inhibitors (SSRIs), has been investigated for their association with ASD (Gidaya et al., 2014). Gestational difficulties have also been related to an increased incidence of ASD. Studies have found associations between preterm birth, low birth weight, and gestational diabetes with ASD (Bilder et al., 2009; Xiang et al., 2018). Prenatal exposure to environmental factors, including air pollution, pesticides, and heavy metals, has also garnered attention as a potential risk factor for ASD (von Ehrenstein et al., 2014; Volk et al., 2013; Shelton et al., 2014). By providing a comprehensive overview of prenatal risk factors in ASD, this review intends to contribute to the existing knowledge base and inform clinical practice, early intervention strategies, and public health policies. Understanding the prenatal origins of ASD may lead to the development of preventive interventions, improved diagnostic tools, and targeted support systems for individuals with ASD and their families. The aim of this research article is to identify and summarize the most consistently reported prenatal risk factors associated with ASD. The article will critically examine the prenatal risk factors that have been consistently linked to ASD development. This will provide a thorough understanding of the elements that may lead to the onset of ASD during pregnancy.

Materials & Methods:

This research employed a descriptive study to investigate the risk factors of ASD. The study included 72 diagnosed ASD subjects from the

School of Beautiful Mind in Uttara, Dhaka. Data were collected through two methods: record file analysis and face-to-face interviews. ASD parents provided prior informed consent. During the interviews, participants were asked to complete a structured questionnaire that encompassed demographic variables and pertinent risk factors. The collected data were then analyzed utilizing SPSS version 21 and Microsoft Excel for statistical analysis. This study received ethical approval from the Institutional Review Committee of **SAIC College of Medical Science and Technology**. Additionally, permission was obtained from the **School of Beautiful Mind**. Written consent, including participants' signatures, was obtained to ensure voluntary participation and an informed understanding of the study's purpose. All data collected were coded and anonymized to protect participant confidentiality.

Results:

The research study involved 72 participants of different age groups, ranging from under 5 years old to over 15 years old. Boys made up a higher proportion (72.2%) than girls (27.8%). The majority of ASD were attending preschool (62.5%), while around one-third (37.5%) were in the first grade. Most fathers worked in service-oriented professions (68.1%), while the rest were involved in business (31.9%). Among the mothers, the majority were housewives (62.5%), followed by those working in service-oriented professions (25%), and a small percentage engaged in business (1.5%), as indicated in **Table 1**.

Table 1 Socio-demographic Characteristics

Variables	n(%)
Age of the ASD (Years)	
<5	12 (16.7)
5-10	38 (52.8)
10-15	17 (23.6)
>15	5 (6.9)
Gender	
Boys	52 (72.2)
Girls	20 (27.8)

ASD Education	
Preschool	45 (62.5)
Class I	27 (37.5)
Occupation of Father	
Service Holder	49 (68.1)
Business	23 (31.9)
Occupation of Mother	
Housewives	45 (62.5)
Service holder	18 (25.0)
Business	9 (1.5)

Mother's age (years)	
≤35	52 (72.2)
>35	20 (27.8)
Father's age	
≤35	41 (56.9)
>35	31 (43.1)
Having Children	
1-2	61 (84.7)
>2	11 (15.3)

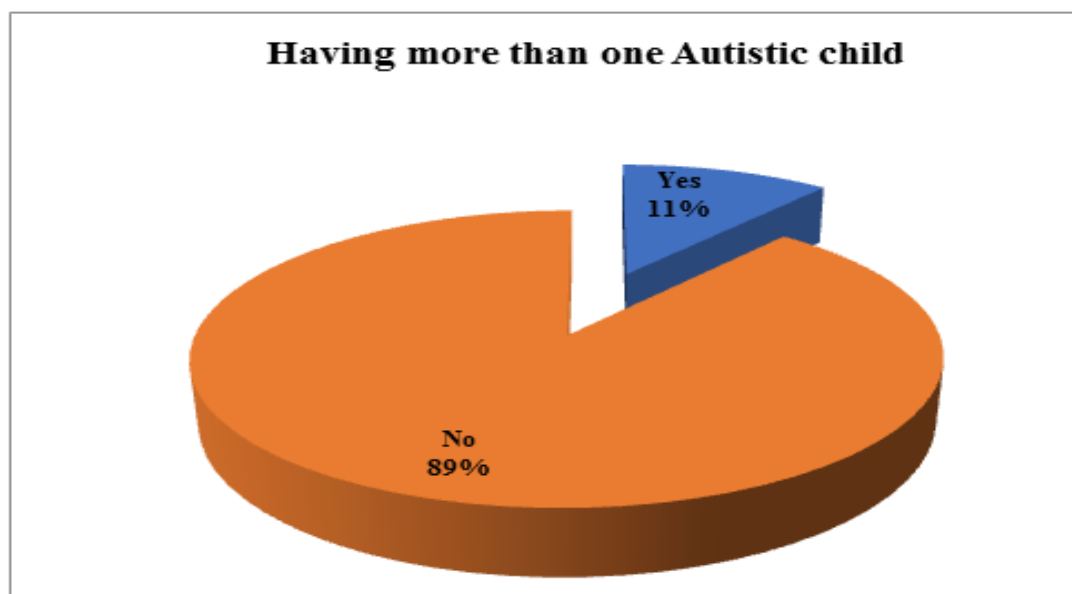


Figure 1: Parents having more than one Autistic child

According to the findings depicted in **Figure 1**, a significant majority of parents indicated that they had no more than one child diagnosed with Autism.

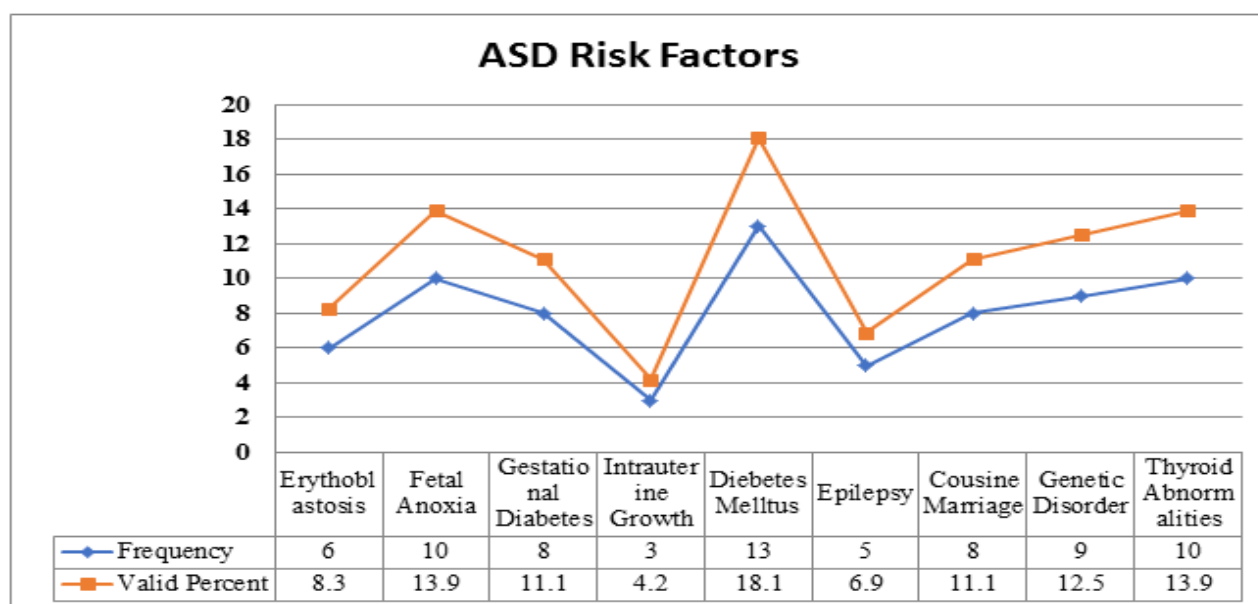


Figure 2: Risk Factors of the ASD

According to the data presented in **Figure 2**, this study highlighted various risk factors, such as erythroblastosis (8.3%), fetal anoxia (13.9%), gestational diabetes (11.1%), epilepsy (6.9%), consanguineous marriage (11.1%), genetic disorders (12.5%), and thyroid abnormalities (13.9%).

Discussion:

The present study aimed to identify risk factors associated with ASD among diagnosed subjects in the School of Beautiful Mind, Uttara, Dhaka. The findings revealed several risk factors, as depicted in Figure 2. These findings are consistent with prior study done in many nations, offering light on the probable causes and connections of ASD. A study conducted in China by **Duan et al., (2014)** explored six prenatal factors that could contribute to ASD, including preeclampsia, placenta previa, gestational diabetes, oligoamnios, and umbilical cord knot. In India, a study identified maternal age over 35 years as significantly associated with ASD (**Mamidala et al., 2013**). In contrast, most mothers in our study were below the age of 35. This difference in findings might be explained by differences in study population and geographical variables. Nonetheless, it is important to consider maternal age as a potential risk factor for ASD, as indicated by the Indian study. Another study conducted by **Gorman et al., (2018)** found that epilepsy, maternal mental health issues, and substance abuse were linked to an increased risk of ASD in children. Furthermore, the greatest risk factors identified in our study were maternal mental health issues and epilepsy. These findings emphasize the importance of addressing maternal mental health and epilepsy during pregnancy to potentially reduce the risk of ASD in children. **Wang et al., (2018)** highlighted several factors associated with an increased risk of autism, including maternal and paternal age of 35 years or older, parental race (white and Asian), gestational hypertension, gestational diabetes, parental education, and antepartum hemorrhage. Although not all of these factors were examined in our study, it is crucial to acknowledge the broader range of risk factors associated with ASD

identified in other studies. It ought to be noted that our study comprised 72 ASD participants ranging in age from 5 to 15 years. Furthermore, in our study, the majority of parents were under the age of 35, and just a small percentage of parents had more than one child with Autism. These demographic characteristics may contribute to a unique profile of risk factors associated with ASD within our study population. While our study contributes to the existing body of research on ASD risk factors, it is important to interpret the findings within the context of its limitations. The sample size was relatively small, and the study was conducted in a specific school setting, which may limit the generalizability of the results. Future studies with larger sample sizes and diverse populations are warranted to further explore the risk factors identified in this study.

Conclusion:

It is concluded, the specific risk factors are indicated for ASD. This study finds out parental age is not directly influenced by the diagnosis of ASD. Assessing prenatal causes fetal anoxia, diabetes mellitus, and thyroid abnormalities are more prone to risk factors than others. This highlights the importance of further investigating these specific prenatal risk factors and their potential mechanisms of influence on ASD.

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