Maternal Risk Factors Associated With Autistic Children

*S Riya[1], M Begum[2], N Begum[3], F Majid[4], S Jahan[5],A Rahman[6]

[1]*Dr. Sayeda Riya , Associate Professor(c.c), Department of Community medicine
Tairunessa Memorial Medical College (TMMC), Gazipur. E mail: dr riya11@gmail.com*
[2]*Dr. Masuma Begum, Associate Professor,Department of Community medicine
Holy Family Red Crescent Medical College, Dhaka*
[3]*Dr. Nadia Begum, Assistant Professor, Department of Community Medicine
Jainul Shikder Womens Medical college, Dhaka*
[4]*Dr. Farzana Majid, Assistant Professor, Departmentof Microbiology
Tairunessa Memorial Medical College(TMMC), Gazipur*
[5]*Dr. Sharmin Jahan, 24 Infantry Division, Chittagong Cantonment*
[6]*Dr. Md.Atiqur Rahman, Associate Professor (c.c), Department.of Community medicine
Anwer khan modern medical college*

*Corresponding Author

ABSTRACT

The present study has been carried out to find out the distribution of prenatal, perinatal and postnatal factors associated with autistic children. The study was conducted on 270 autistic children with age ranges of 3-10 years attending special schools in Dhaka city exclusively for autistic children during July ,2001 to July ,2012 .Mean age of mother was 31.78 SD$\pm$ 5.94 years .Socio demographic characteristics showed 84% housewives, 37%   educated up to masters level. Mean family monthly income was Tk.24,596 SD$\pm$11,464.Antenatal factors showed 42.2% mothers anemic,44.4% had H/O pre eclampsia,40% threatened abortion, 38.1% had gestational diabetes. Perinatal factors showed obstructed labor to be 64.4%.Post natal factors showed birth asphyxia to be 47.0% and neonatal jaundice 72.6% . The study showed a higher maternal age is significantly associated with autism.(p=0.007, RR=1.18,95% CI, 0.87- 1.60) and birth asphyxia is strongly associated with autism (p=0.001,OR=8.86 , 95% CI, 1.91-41.04) .The increasing prevalence of ASD`s indicates that it is multifactorial in which genetic, prenatal, social, developmental, nutritional and environmental factors play major roles.

Key Words: ASD, Antenatal, Perinatal, Postnatal factors

Introduction

Autism spectrum disorder (ASD) is a group of neuro developmental disorders defined by social and commication deficits and repetitive behaviors that are typically detectable in early childhood, continuing throughout life[1]. It becomes apparent before a child is three years old and has a steady course with no remission. It is part of a larger family called the Autism Spectrum disorders (ASD)[2]. Neurological development of the foetus depends mainly on four factors: maternal nutrition before, during, after pregnancy, and the child's nutrition after breast feeding is over[3]. Heritability contributes about 90% of the risk of a child developing autism[4,5]. Risk factors for autism include parental characteristic such as advanced maternal age and advanced paternal age as well[6,7]. Study on prenatal, perinatal and postnatal factors in ASD showed maternal stress, early pregnancy bleeding and bed rest, family stress and that there is association between several pre, peri and postnatal complications and ASD. A higher incidence of uterine bleeding, prolonged labour, increased incidence of oxygen requirement, and hyperilirubiremia and was found[8].

Materials and Methods

This was a descriptive type of cross sectional study conducted at four selected schools for Autistic children of Dhaka City from July 2011to June 2012. Respondents were mothers of autistic children who

came to the schools with their children. Autistic children aged 3-10 years were the study population. Other developmental disorders eg Down's syndrome, cerebral palsy were not included in the study. A total of 270 mothers of autistic children were interviewed with a semi structured pre tested questionnaire by purposive sampling technique. The data was tabulated and analyzed using chi square test to study the association between various factors. Level of significance was estimated with 95% confidence intervals and P value.

Results

This study found that mean age of mother of autistic children was 31.78 SD±5.94 years.Sociodemographic characteristics showed 84.17% housewives, 37.4% educated up to masters level. Mean family monthly income was Tk 24,596 SD ± Tk 11,464. Antenatal factors showed 42.2% mothers anemic, 44.8% had H/O pre eclamptic toxemia of pregnancy, 40% threatened abortion, 38.1% had gestational diabetes. Among perinatal factors obstructed labor was highest 64.4%, while post natal factors showed neonatal jaundice / hyperbilirubinemia,72,6% ,among majority of children and birth asphyxia was 47%. A strong association was found between a higher maternal age (p=0.007), birth asphyxia (p=0.001) and development of autism.

Table-II: Distribution of socio demographic characteristics:

Age of the mother during delivery		Percent (%)
≤25 years	37	13.7
26-30 years	84	31.1
31-35 years	89	33
>35 years	60	22.2
Occupation of mother		
House wife	227	84.1
Job holder	34	12.6
Business	7	2.6
Education of mother		
Primary level	38	14.1
Secondary level	69	25.6
HSC to Degree	62	23.0
Masters and above	101	37.4
Monthly family income (Taka)		
≤20000	99	36.7
20001-30000	108	40.0
30001-40000	37	13.7
>40000	26	9.6

Table-II: Distribution of antenatal factors (n=270)

Comp lications	Frequency(no)	Percent (%)
Anemia	114	42.2
Threatened abortion	108	40.0
Twin pregnancy/Multiple pregnancy	26	9.6
Pre eclampsia/PET	121	44.8
Gestational Diabetes	103	38.1

*Multiple response x^2=6.57, df=1,p=0.01, OR=2.13 ,95%CI (1.74 2.63)

Table-III: Distribution of respondents by perinatal factors: (n=270)

Complication during labour and delivery	Frequency(no)	Percent (%)
Obstructed labour	174	64.4
Mal presentation	47	17.4
Cord round the neck	70	25.9

*Multiple respo nse x^2=0.051, df=1 , p= 0.82 , OR=2.15, 95 % CI (1.764 2.637)

Table-IV: Distribution of the respondents by post natal factors: (n=270)

Complications of the new born	Frequency(n	Percent (%)
Birth asphyxia	127	47.0
Birth injury	89	33.0
Neonatal jaundice/ Hyperbilirubinem	196	72.6

X^2=4.653, p=0.001, OR= 8.86 ,-CI (1.916 41.04)

Discussion

The rise in children with autism creates a definite need for awareness amongst public health experts, "World Autism Awareness day" is observed every April 2nd indicating this tragic condition among the children and drawing universal attention.

This study evaluated a variety of sociodemographic factors like age, socioeconomic status and educational status of mothers and development of autism. Parental level of education varies with autism. This present study showed that most of the mothershad degrees masters and above (34%). This could be due to their urban residence and family back ground. Zimmer man PJ et al[9]

however showed a small but statistically significant difference between the mean duration of maternal education for cases and control, 13.63 years SD±2.17 VS 13.23 years, SD±2.24, P=0.034 but no association between risk of autism and years of maternal education. These differences could be due to socio cultural and economic factors.

In this present study socio economic status was evaluated and the mean family income was TK 27.546 SD ± Tk 11,464; while Zimmerman PJ et[9] found no clear association between income and autism nor did the study[10] show that house hold income level have any association with ASD.

A child's risk of developing ASD is associated with the age of its mother at birth.[11,12] In this present study the mean maternal age at delivery was found to be 31.78 years SD ± 5.95. Similarly Larsson et al[13] and Durkin et al[14] all showed advanced maternal age > 40 years was significantly associated with autism and Bilder D et al[15] also showed significant association between advanced maternal age > 35 years (OR:1.68 ,CI: 1.01-2.78,P=0.043) and autism. Possible explanations could be that mutations, increased risk of chromosomal abnormalities and pregnancy complications which increase with advancing age.

Prenatal conditions in my present study were anemia (42%), threatened abortion (40%), PET(44.8%),and Gestational diabetes (38.1%).Similarly Zhang et al1[6] showed significant maternal complications like anemia, and PET and Naya Jull et al1[8] showed higher incidence of threatened abortion. Teresa A et al1[8] reported early pregnancy bleeding, gestational diabetes and PET. All these could be due to poor nutrition, lifestyle, and heavy workload on the mothers as they have to take care of the family leading to no rest.

Perinatal complications in the present study showed mostly obstructed labour 64.4 %, cord round the neck 25.9% and malpresentation (Breech) 17.4%, leading to assisted delivery like C/S and forceps delivery. This could be attributed to many factors namely lack of knowledge, failure to reach the health facilities

in time, not proper antenatal check up, lack of proper diagnostic facilities and willful negligence of the medical professionals. Similar findings were found by Brimacombe et al, 2007 who found C/S to be 29.9% Bilder D et al 15found these children were more likely to have a breech presentation (OR=2.10% CI: and Naya Jull et al[19] showed rates of breech position, cord prolapse and assisted delivery methods. The reasons for these dissimilarity could be better technology and health care facilities in the western countries.

Post natal complications like birth asphyxia (p=0.001) have an association with autism which correlates with findings of Finnegan and Arrington[20].

Conclusion

ASD`s are complicated conditions in which genetic, prenatal, social,developmental, nutritional and environmental factors play major roles. Larger studies are needed to determine optimum multifactorial treatment plans involving nutrition, environmental control, medication and behavioral/education/speech/physical therapies. Perhaps future studies may help to identify children at risk for these disorders earlier and lead to more effective interventions to enhance the quality of life for individuals with these diagnoses and their families.

References

1. Zhang X, Cong L, Tin J, et al. Pre-natal and perinatal Risk factors for Autism in child, J Autism Dev Discord, 2010 November; 40 (11) :1311-1321.

2. American psychiatric Association, Diagnostic and statistical mental Disorders, 4th Ed. 2000. ISBN 0890420254. World Health organization. International statistical classification of Diseases and Related Health problems. 10th ed. 2006. Pervasive developmental disorders.

3. Kuehn BM. CDC: autism spectrum disorders common. JAMA. 2007 ; 297 (9) : 940.

4. Timothy B et al, supplement article. Evaluation, Diagnosis, and treatment of Gastro intestinal disorders in individuals with ASDs: A consensus report pediatrics vol. 125 No. supplement 1st January 1, 2010 pp.sl-518.

5. Levys E, Souders MC, Ittenbach RF, et al. Pinto-Martin JA Bio Psychiatry, 2007 February 15, 61 (4) : 492-7.

6. Horvath K, Perman JA, Autsm and gastro intestinal symptoms. Cu Gastroentrol Rep. 2002; 4 (3): 251-258.

7. Wakefield AJ. The gut brain axis in childhood developmental disorders. J paediatr Gastroenterol Nutr.2002; 34 (Suppl):S14-S 17.

8. Molloy CA, Manning -Courtney P, Prevalence of chronic gastrointestinal symptoms in children with autism and ASD. Autism 2003; 7 (2): 165- 171.

9. Valicenti MC, Dermott M, Mvicar K, et al. Frequency of gastro intestinal symptoms in children with ASD and association with family history of autoimmune disease. J Dev pediatr; 27 (2 Suppl) : S 128 - 136.

10. Ericson CA, Stigler KA, Corkins MR, et al. Gastrointestinal factors in autistic children: acritical review. J Autism Dev Disord, 2005; 35(6):713-27.

11. Mhtml : file:// C. Autism nutrition Nutritional and biomedical support for children with Autism.

12. James B Adams, Leah J Johansen, D powell Linda, et al. Gastro intestinal flora and gastro intestinal status in children with autism comparisons to typical children and correlation with autism severity. BMC Gastro enteral. 2011; 11: 22.

13. Adams JB Romdalvik J, Ramarujam VMS, legator MS. Mercury, Lead and Zinc in Baby teeth of children with Autism VS. controls. J toxicol Environ Health. 2007; 70 (12) : 1046-51.

14. Adams JB, Holloway CE, Georgef, Quigd. Analyses of toxic metals and essential minerals in the hair of Arizona children with autism and their mothers. Boil tr EL Res. 2006; 110 (8) :193-209.

15. Konstantrareas MM. Homatidis. Ear infections in autistic and normal children, Journal of autism and Developmental disorders. 1987;17 (4) : 585-594.

16. Robayo- Tarres CC, Quezada- Calvillo R, Nicholas BL. Disaccharide digestion: Chemical and molecular aspects. Clin Gastro enterol Hepatol. 2006; 4: 276-287.

17. Tayor B, vaccines and the changing epidemiology of autism. Child care Health Dev. 2006; 32 (5) 511-9.

18. Buie T, Campbell DB, Fuchs Gj, 3rd, Furuta GT, levy J, et al, evaluation diagnosis, and treatment of gastro intestinal disorders intestinal disorders in individuals with ASDs: a consensus, report. Pediatrics 2010; 125 (suppl) : 51-18.

19. Molloy CA, Manning- Courtney P, Prevalence of chronic gastro intestinal symptoms in children with autism and ASD's. Autism. 2003; 7 (2): 165-171.

20. Nikolov Roumen N et al, Gastro intestinal symptoms in a sample of children with PDD autism Dev Disord. 2009 Aug; 29(2) : 405-413.

21. Buie T, winter H, Kushakrm, R: preliminary findings in gastro intero intestinal investion of autistic patients. Nutr neurosci 2003. February; 6 (1) 19 -28.