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Pregnancy Related Factors Associated with Epileptic & Non-Epileptic Children.

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Abstract
Introduction: *Epilepsy is one of the emerging public health problems in developing as well as developed countries. Epilepsy is one of the most common neurological disorders and has no age, racial, social, sexual or geographical boundaries;*
Aim of the study: *To find out the factors during pregnancy which are responsible behind epilepsy.*
Methods: *This is a comparative cross-sectional study was conducted in the Department of Department of Child Development and Neurology Department of Dhaka Shishu Hospital, Shaymoly, Dhaka, Bangladesh during the period from January to June 2010.*
Result: *There is no significant association between maternal educational status and development of epilepsy in children (χ^2=11.598, df=6, P=0.072), strong association between use of ANC and children suffer from epilepsy (χ^2 = 7.121, df=1, P<0.008), significant association between place of delivery of the children and epilepsy (χ^2 value=26.425, df=3, P= 0.0001) and also significant association between duration of delivery of the children and epilepsy (χ^2=16.111, df=2, P=0.0001).*
Conclusion: *It was found that Epilepsy was caused by birth trauma in majority cases.*

Key words: *Pregnancy, epilepsy, non epileptic*
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I. Introduction

Epileptic child is a misery for the parents. Epileptic child causes many strains in the family. The parents carry a sense of guilt and will blame themselves for the suffering of the children. The children will need more help with his day-to-day necessities, tend to get socially isolated which again contribute to their unhappiness. The family as a hole faces a lot of practical problems like relatives at home, visiting friends and attending social functions. A report of 130 patients from the epilepsy clinic of BSMMU showed that close to 70% of patients visited indigenous medicine practitioners, exorcists, spiritualists prior to consulting the clinic, only 29% perceived epilepsy as a disease, 50% dropped out from school, (58% of whom due to epilepsy), and 52% of patients had to change job because of epilepsy[1].

Research findings regarding the effects of childhood epilepsy on general intelligence have produced variable results. The aim of this study was to investigate the factors of epilepsy, age of seizure onset, and Antiepileptic Drugs (AED) on intellectual ability as assessed by the Wechsler Intelligence Scale for Children, 3rd Edition (WISC-III; Wechsler, 1991). Comparison using an ANOVA revealed significant differences across WISC-III Index standard scores (p = 0.0005) and subtest scaled scores (p = 0.0013), with control participants performing better than epileptic participants[2].

Past research has found that children with epilepsy exhibit memory skills. In addition some studies have found that children with epilepsy obtain significantly lower IQ scores than controls[3]. In developing countries due to socio-cultural effects problems of epileptic patients at community level are high[4]. In developed countries the overall incidences of epilepsy in the general population is estimated to range from 0.5% to 2.0%[5]. Approximately 80% of all patients with epilepsy have their first seizure before 20 years of age[6]. The highest incidence rates are observed in neonates and children and then with a second pick in old ages[7]. About 30,000 children adolescence are diagnosed each year with epilepsy in the United States of America[8]. And 50 per

thousand will have at least 1 fit at some time in childhood[9]. The magnitude of childhood epilepsy is slightly to be greater in developing countries due to greater incidence of risk factors predisposing to epilepsy. In India incidence is 4 – 8 per ten thousand and prevalence is higher[10]. In Bangladesh there is no national statistics of incidence and prevalence of epilepsy. One study of childhood seizure revealed intracranial infections (36%) and febrile seizure (25%), were the two major causes of seizures followed by epilepsy (17%) [11]. Another study, carried out in 1996, showed intracranial infections (44%), febrile seizure (25%) and epilepsy (12%) were the major causes of seizure[12]. So, epilepsy is a common neurological health problem in our country.

There was no in-depth study on intelligence quotient of epileptic children in Bangladesh. So in this study attention were paid to compare the intelligence quotient of epileptic and non-epileptic children and to find out the socio-demographic characters of the children. By this study we can also find out associated risk factors of epileptic children of Bangladesh. The information collected through this study will be helpful in formulating specific strategies to raise intelligence quotient of epileptic children and to improve awareness of the parents regarding risk factors related to epilepsy.

II. Objectives

a) General objective:

- To find out the factors during pregnancy which are responsible for epilepsy.

b) Specific Objectives:

- To assess the relationship between pregnancy and epilepsy.
- Determine the factors related to epilepsy during the pregnancy

III. Methodology & Materials

This was a comparative cross sectional study and was conducted in the Department of Child Development and Neurology Department of Dhaka Shishu Hospital, Shaymoly, Dhaka, Bangladesh during the period from January to June 2010. Epileptic and non-epileptic children attending at Child development and Neurology Unit of Dhaka Shishu Hospital were taken as study population in this study from which 110 children were interviewed purposively and necessary information were collected on them 55 children were epileptic and rest 55 children were non epileptic. Categorizing of data, Coding and Summarizing the data and entry of data into the software SPSS 17.0.

IV. Result

It was found that that among 55 epileptic children 9 (16.4%) represented the age group of 4-6 years, 33 (60.0%) represented the age group of 7-9 years, 8 (14.5%) represented the age group of 10-12 years and 5 (9.1%) represented the age group of 13-14 years. So majority of the epileptic children 33 (60.0%) belongs to age group of 7-9 years. Among 55 non-epileptic children 13 (23.7%) represented the age group of 4-6 years, 34 (61.8%) represented the age group of 7-9 years, 7 (12.7%) represented the age group of 10-12 years and 1 (1.8%) represented the age group of 13-14 years. So majority of the non-epileptic children 35 (61.8%) belongs to age group of 7-9 years {table-I}. This study showed that majority of the children, 101 (91.8%) children were Muslim and rest 9 (8%) were Hindu which are shown by the following pie-chart {Figure-I}. By housing condition most of the children (43%) were residing in pucca house, 40% in semi-pucca and only 17% lived in kacha house which are shown by the bar diagram given below {Figure-II}. There the association of between mother's education and epilepsy. Among the 55 epileptic children 2 of their mother were found educated at masters level, 6 were graduate, 09 were educated at the level of HSC, 7 passed SSC, 2 at the level of secondary, 7 educated at the level of primary (I-V) and most of them 22 were illiterate. In the other hand children those who didn't have epilepsy 8 of their mother were found educated at masters level, 12 were graduate, 14 were educated at the level of HSC, 4 passed SSC, 1 at the level of secondary, 4 educated at the level of primary (I-V) and 12 were illiterate. There is no significant association between maternal educational status and development of epilepsy in children (χ^2=11.598, df=6, P=0.072) {Table-II}. It was found that among epileptic children majority 40 (72.7%) were 1st issue, 10 (18.2%) were 2nd issue and 5 (9.1%) were 3rd issue. Among non-epileptic children majority 25 (45.5%) were 2nd issue, 15 (27.3%) were 1st issue and 15 (27.3%) were 3rd {Figure-III}. Mothers those who received ANC 39 developed epilepsy and 50 did not. Mother those who didn't received ANC 16 developed epilepsy and 5 didn't had epilepsy. There is a strong association between use of ANC and children suffer from epilepsy (χ^2 = 7.121, df=1, P<0.008), {Table-IV}. It was found that among the mothers of 55 epileptic children 25 (45.5%) mothers were of age group 20-25 years at child birth, 29 (52.7%) were of age group 26-30 years and 1 (1.8%) were of age group 31-35 years. Among the mothers of 55 non-epileptic children 18 (32.7%) mothers were of age group 20-25 years at child birth, 30 (54.5%) were of age group 26-30 years and 7 (12.7%) were of age group 31-35 years{Table-V}. It was revealed that among mothers of 55 epileptic children 16 (29.1%) suffered from mental stress during pregnancy and 39 (70.9%) did not. Among mothers of 55 non-epileptic children 1 (1.8 %) suffered from mental stress during pregnancy and 54 (98.2%) did not. There is

strong association between mothers suffered from mental stress during pregnancy and children suffer from epilepsy{Table-VI}. It was found that among mothers of 55 epileptic children 15 (27.3%) suffered did hard work during pregnancy and 40 (72.7%) did not. Among mothers of 55 non-epileptic children none performed hard work during pregnancy. There is strong association between mothers performed hard work during pregnancy and children suffer from epilepsy {Table-VII}. It has been found that out of 55 mothers of epileptic children only 6 (10.9%) suffered from diabetes mellitus, 2 (3.6%) from coronary heart disease, 13 (23.6%) from hypertension, 16 (29.1%) from anemia, 1 (1.8%) from eclampsia, 23 (41.8%) from high fever and 17 (30.9%) suffered from trauma during pregnancy. 6 (10.9%) of these mothers did not suffer from any disease. At the same time out of 55 mothers of non-epileptic children only 2 (3.6%) suffered from diabetes mellitus, 2 (3.6%) from coronary heart disease, 1 (1.8%) from hypertension, 10 (18.2%) from anemia, 2 (3.6%) from high fever and 2 (3.6%) suffered from trauma during pregnancy. 41 (74.5%) of these mothers did not suffer from any disease. From this analysis it has been found that majority 23 (41.8%) of the mothers of epileptic children suffered from high fever during their pregnancy {Table-VIII}. It was found that among the 55 epileptic children, i.e., majority 25 (45.5%) delivered at home, 10 (18.2%) delivered at govt. hospitals, 6 (10.9%) delivered at private hospitals, 14 (25.5%) delivered at private clinics. Among 55 non-epileptic children majority 29 (52.7%) delivered at private clinics, 15 (27.3%) delivered at government hospitals, 9 (16.4%) at private hospitals, 2 (3.6%) delivered at home. There is significant association between place of delivery of the children and epilepsy (χ^2 value=26.425, df=3, P= 0.0001), {Table-IX}. It was found that among 55 epileptic children majority 37 (67.3%) were delivered normally and 18 (32.7%) were delivered by cesarean section. At the same time among 55 non-epileptic children 24 (43.6%) were delivered normally and majority 31 (56.4%) were delivered by cesarean section. There is significant association between mode of delivery of the children and epilepsy (χ^2 value=6.219, df=1, P= 0.01), {Table-X}. Among the 55 children those who had developed epilepsy majority 24 had face prolong labour which is 10-14 hours, 22 had delivery hours between 6-9 hours and 9 had labour hour between 2-5 hours. Among the-non epileptic children 29 had lobour hour between 2-5 hours, 13 had labor hour between 6-9 hours and rest 13 had a prolong labour which is 10-14 hours. There is significant association between duration of delivery of the children and epilepsy (χ^2=16.111, df=2, P=0.0001), {Table-XI}. It was found that majority, 20 (36.4%) of the mothers of epileptic children experienced prolonged labor, 6 (10.9%) had obstructed labor, 10 (18.2%) had haemorrhage, 11 (20.0%) had cord prolapse, 5 (9.1%) had leaking membrane, 5 (9.1%) had hypertension, and 2 (3.6%) became unconscious during delivery. 10 (18.2%) of these mothers faced no problem. At the same time majority, 31 (56.4%) of the mothers of non-epileptic children experienced no problem at all, but 5 (9.1%) experienced prolonged labor, 6 (10.9%) had obstructed labor, 5 (9.1%) had haemorrhage, 4 (7.3%) had cord prolapse, 4 (7.3%) had leaking membrane, 3 (5.5%) had hypertension, and 2 (3.6%) became unconscious during delivery, {Table-XII}

Table-I: Distribution of age (years) of epileptic and non-epileptic children (n=55)

Age of the child in year	Whether the child suffer from epilepsy			
	Yes		No	
	Frequency	Percent (%)	Frequency	Percent (%)
4-6 years	9	16.4%	13	23.7%
7-9 years	33	60.0%	34	61.8%
10-12 years	8	14.5%	7	12.7%
13-14 years	5	9.1%	1	1.8%
Total	55	100.0%	55	100%
Mean age	7.92 years. SD ±2.18		7.95 years. SD ±2.17	

Figure-I: Distribution of the children by housing condition (n=110)

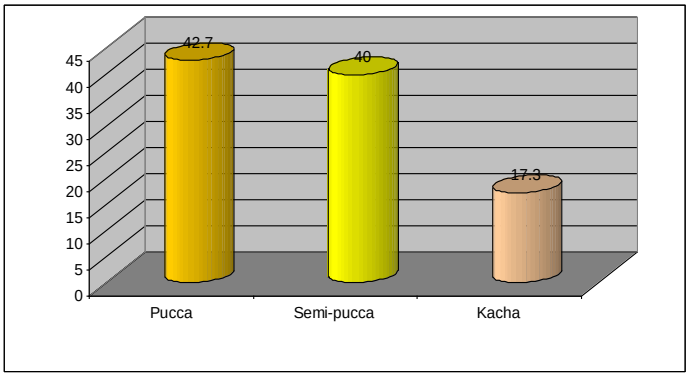

Table-II: Distribution of educational level of the mothers between epileptic and non-epileptic children (n=110)

Educational status of the mother	Children (n=110)			χ^2 Test		
	Epileptic	Non-epileptic	Total	χ^2 value	Df	P value
Masters	2	8	10	11.598	6	0.072
Graduate	6	12	18			
HSC	9	14	23			
SSC	7	4	11			
Class VI – X	2	1	3			
Class I-V	7	4	11			
Illiterate	22	12	34			
Total	55	55	110			

Figure-III: Distribution of children by birth order (N=110)

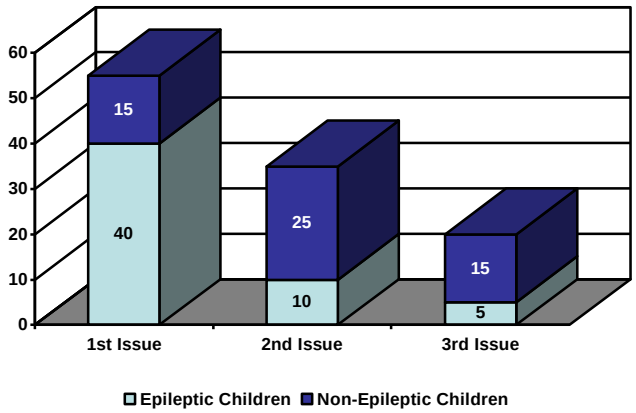

Table-IV: Relationship between use of ANC by mothers and children suffer from epilepsy (n=110)

Whether mothers had ANC	Whether children suffers from epilepsy			χ^2 Test		
	Yes	No	Total	χ^2 value	df	P value
Yes	39	50	89	7.121	1	0.008
No	16	5	21			
Total	55	55	110			

Table-V: Relationship between age of mother at child birth and whether the child suffers from epilepsy (n=55)

Age of the mother at child birth (years)	Whether the child suffer from epilepsy			
	Yes		No	
	Frequency	%	Frequency	%
20 – 25	25	45.5%	18	32.7%
26 – 30	29	52.7%	30	54.5%
31 – 35	1	1.8%	7	12.7%
Total	**55**	**100.0%**	**55**	**100.0%**

Table-VI: Relationship of the mother suffered from mental stress during pregnancy and whether the children suffer from epilepsy (n=55)

Mother suffers from mental stress during pregnancy	Whether the children suffer from epilepsy				χ^2 Test		
	Yes		No				
	Frequency	%	Frequency	%	χ^2 value	df	P-value
Yes	16	29.1%	1	1.8%	15.655	1	0.0001
No	39	70.9%	54	98.2%			
Total	55	100.0%	55	100.0%			

Table-VII: Relationship of the mother performed hard work during pregnancy and whether the children suffer from epilepsy(n=55)

Mother performed hard work during pregnancy	Whether the children suffer from epilepsy				χ^2 Test		
	Yes		No				
	Frequency	%	Frequency	%	χ^2 value	df	P-value
Yes	15	27.3%	0	0.0%	17.368	1	0.0001
No	40	72.7%	55	100.0%			
Total	55	100.0%	55	100.0%			

Table-VIII: Distribution of the mothers by diseases during pregnancy (n=55)

Diseases of mother during pregnancy	Epileptic Children		Non-Epileptic Children	
	Frequency	%	Frequency	%
Diabetes Mellitus	6	10.9%	2	3.6%
Coronary Heart Disease	2	3.6%	2	3.6%
Hypertension	13	23.6%	1	1.8%
Anaemia	16	29.1%	10	18.2%
Eclampsia	1	1.8%	0	0.0%
High Fever	23	41.8%	2	3.6%
Trauma	17	30.9%	2	3.6%
None	6	10.9%	41	74.5%

Table-IX: Distribution of the children by place of delivery and epilepsy (n=110)

Place of delivery of children	Whether children suffer from epilepsy			χ^2 Test		
	Yes	No	Total	χ^2 value	df	P value
Home	25	2	27	26.425	3	0.0001
Govt. hospital	10	15	25			
Pvt. Hospital	6	9	15			
Pvt. Clinic	14	29	43			
Total	55	55	110			

Table-X: Distribution of the children by mode of delivery and epilepsy (n=110)

Mode of delivery of children	Whether children suffer from epilepsy			χ^2 Test		
	Yes	No	Total	χ^2 value	df	P value
Normal	37	24	61	6.219	1	0.01
Cesarean section	18	31	49			
Total	55	55	110			

Table-XI: Relationship between duration of delivery (hours) of the children and epilepsy (n=110)

Duration of delivery of child (Hour)	Whether children suffer from epilepsy			χ^2 Test		
	Yes	No	Total	χ^2 value	df	P value
2 – 5	9	29	38	16.111	2	0.0001
6 – 9	22	13	35			
10 – 14	24	13	37			
Total	55	55	110			

Table-XII: Problems suffered by mothers during delivery (n=55)

Diseases of mother during pregnancy	Epileptic Children		Non-Epileptic Children	
	Frequency	%	Frequency	%
Prolonged labour	20	36.4%	5	9.1%
Obstructed Labour	6	10.9%	6	10.9%
Haemorrhage	10	18.2%	5	9.1%
Cord Prolapse	11	20.0%	4	7.3%
Leaking Membrane	5	9.1%	4	7.3%
Hypertension	5	9.1%	3	5.5%
Unconsciousness	2	3.6%	2	3.6%
Others (had no problem)	10	18.2%	31	56.4%

V. Discussion

The mean age of the children in this study was 7.94 years (±SD 2.18) and the highest frequency occurred in the age group of 7-9 years (60.9%) for both male and female. Among 55 epileptic children 26 (47%) were from urban area and 20 (26%) from rural area which figure was different from the findings – higher prevalence was found in rural population in Pakistan, a literature review conducted by Dr. I. A. Khatri, M. Abdullah, et. al., August 2003[27]. It has been found that out of 55 mothers of epileptic children only 6 (10.9%) suffered from diabetes mellitus, 2 (3.6%) from coronary heart disease, 13 (23.6%) from hypertension, 16 (29.1%) from anemia, 1 (1.8%) from eclampsia, 23 (41.8%) from high fever and 17 (30.9%) suffered from trauma during pregnancy. 6 (10.9%) of these mothers did not suffer from any disease. At the same time out of 55 mothers of non-epileptic children only 2 (3.6%) suffered from diabetes mellitus, 2 (3.6%) from coronary heart disease, 1 (1.8%) from hypertension, 10 (18.2%) from anemia, 2 (3.6%) from high fever and 2 (3.6%) suffered from trauma during pregnancy. 41 (74.5%) of these mothers did not suffer from any disease. From this analysis it has been found that majority 23 (41.8%) of the mothers of epileptic children suffered from high fever during their pregnancy. It was found that among 55 epileptic children majority 37 (67.3%) were delivered

normally and 18 (32.7%) were delivered by cesarean section. It was found that majority, 20 (36.4%) of the mothers of epileptic children experienced prolonged labor, 6 (10.9%) had obstructed labor, 10 (18.2%) had haemorrhage, 11 (20.0%) had cord prolapse, 5 (9.1%) had leaking membrane, 5 (9.1%) had hypertension, and 2 (3.6%) became unconscious during delivery. 10 (18.2%) of these mothers faced no problem. At the same time majority, 31 (56.4%) of the mothers of non-epileptic children experienced no problem at all, but 5 (9.1%) experienced prolonged labor, 6 (10.9%) had obstructed labor, 5 (9.1%) had haemorrhage, 4 (7.3%) had cord prolapse, 4 (7.3%) had leaking membrane, 3 (5.5%) had hypertension, and 2 (3.6%) became unconscious during delivery, Several studies have explored the association between prenatal infection and the risk of neurological and psychiatric disorders. Intrauterine exposures to maternal infections, chorioamnionitis, and modest maternal fever during labour have been associated with an increased risk of cerebral palsy[13,14,15,16]. Furthermore, maternal infection during pregnancy has been associated with an increased risk of epilepsy[17,18,19,20], schizophrenia[21,22], autism[23,24], and even multiple sclerosis[25], but the causal mechanism(s) still remain undetermined. The link may be directly mediated through an infection of the fetal brain; an indirect mechanism such as fever, cytokine exposure, dietary changes; or, confounding by subclinical impaired maternal immune function. The former mechanisms have been comprehensively reviewed[26].

Findings might be more reliable with a better study design and large sample. Future research work could evaluate the effect of epilepsy on intelligence quotient of children and also find out the risk factors of epilepsy to reduce the burden of the disease and restoration of intelligence quotients of the victim children. Findings might be more reliable with a better study design and large sample. Future research work could evaluate the effect of epilepsy on intelligence quotient of children and also find out the risk factors of epilepsy to reduce the burden of the disease and restoration of intelligence quotients of the victim children.

VI. Limitations of the study

The study was conducted in a selected hospital so the study findings might not represent the true picture of epilepsy. Due to time constrains all risk factors of epilepsy could not be covered in this study. As most of the information were collected with a questionnaire based on the memory of the respondents there were possible chances of recall bias.

VII. Conclusion and recommendations

It was a comparative cross sectional study of epileptic and non-epileptic children. It was evident that maximum epileptic children were delivered at home and their mother experienced prolonged labor. It was found that Epilepsy was caused by birth trauma in majority cases. The most epileptic children lived in pucca. An increased risk of epilepsy was found in children born to mothers who had hospital recorded infection either before or during pregnancy. Even in mothers without hospital recorded infection during pregnancy, we found an association between infections before pregnancy and the outcomes under study. These findings indicate that other non-genetic factors play a role. The study result showed that the risk factors of epilepsy are birth trauma, home delivery, prolonged labor and fever. So, intervention, like antenatal care, hospital delivery etc. should be taken to avoid cause of risk factors. More in-depth research works should be encouraged in this field to explore the etiological factors of epilepsy more clearly and also to assess the relationship between the conditions of pregnancy and epilepsy.

References

[1]. Anwarullah AKM, Khan MRK, Hakim M, Hague A, Mannan MA, Attitude of family and community towards epilepsy. *Neuron* 2004; 4: 14-20.

[2]. O,Leary SD at al, Performance of children with epilepsy and normal age-matched controls on the WISC-III, *Child Neuropsychol*, 2006 Jun; 12(3): 173-80.

[3]. Borden KA, at al, A comparison of children with epilepsy to an age- and IQ-matched control group on the Children's Memory Scale. *Child Neuropsychol*, 2006 Jun; 12(3): 165-172.

[4]. Shorvon SD, et al, Epilepsy in developing countries. A review of epidemiological, socio-cultural and treatment aspect. *Epilepsia* 1998; 29(suppl): S36-S54.

[5]. Kale R, Bringing epilepsy out of the shadows, *BMJ* 1997; 315: 2-3.

[6]. Cavazzuri GB, Epidemiology of different types of epilepsy in school age children of Modena, Italy. *Epilepsia* 1980; 21" 57-62.

[7]. Shorvon SD, Handbook of epilepsy treatment. Bangalore: Blackwell Science Ltd; 2000

[8]. Halsam RHA, The Nervous System, Nelson Text Book of Pediatrics, 16th ed, WB, Saunders Company.

[9]. Brown JK, et al, Acute CNS Disorders, Forfar and Arneli's Textbook of Pediatrics. 5th ed.

[10]. Karla V, Management of childhood epilepsy, Indian Journal of Pediatrics, Special Supplement on Epilepsy, 2000 January; 67: 512-521.

[11]. Berkovic SF, Childhood absence epilepsy and juvenile absence epilepsy, The Treatment of Epilepsy: Principle and Practice, Baltimore, Williams and Wilkins 1996; 461-466.

[12]. Begum H, Aetiology and Hospital Outcomes of Convulsive Disorders in Children (Dissertation). Dhaka BCPS, 1996.

[13]. Schendel DE (2001) Infection in pregnancy and cerebral palsy. J Am MedWomens Assoc 56: 105–108.

[14]. Nelson KB (2008) Causative factors in cerebral palsy. Clin Obstet Gynecol 51: 749–762.

[15]. Nelson KB (2009) Infection in pregnancy and cerebral palsy. Dev Med Child Neurol 51: 253–254.

[16]. Zanardo V, Trevisanuto D, Cosmi E, Chiarelli S (2010) Chorioamnionitis and cerebral palsy: a meta-analysis. Obstet Gynecol 116: 1454.
[17]. Sun Y, Vestergaard M, Christensen J, Nahmias AJ, Olsen J (2008) Prenatalexposure to maternal infections and epilepsy in childhood: a population-based cohort study. Pediatrics 121: e1100–e1107.
[18]. Sun Y, Vestergaard M, Christensen J, Olsen J (2011) Prenatal exposure toelevated maternal body temperature and risk of epilepsy in childhood: a population-based pregnancy cohort study. Paediatr Perinat Epidemiol 25: 53– 59.
[19]. Miller JE, Pedersen LH, Sun Y, Olsen J (2012) Maternal use of cystitismedication and childhood epilepsy in a danish population-based cohort. Paediatr Perinat Epidemiol 26: 589–595.
[20]. Norgaard M, Ehrenstein V, Nielsen RB, Bakketeig LS, Sorensen HT (2012) Maternal use of antibiotics, hospitalisation for infection during pregnancy, and risk of childhood epilepsy: a population-based cohort study. PLoS One 7: e30850.
[21]. Takei N, Mortensen PB, Klaening U, Murray RM, Sham PC et al. (1996) Relationship between in utero exposure to influenza epidemics and risk of schizophrenia in Denmark. Biol Psychiatry 40: 817–824.
[22]. Westergaard T, Mortensen PB, Pedersen CB, Wohlfahrt J, Melbye M (1999) Exposure to prenatal and childhood infections and the risk of schizophrenia: suggestions from a study of sibship characteristics and influenza prevalence.
[23]. Arch Gen Psychiatry 56: 993–998.
[24]. Atladottir HO, Thorsen P, Schendel DE, Ostergaard L, Lemcke S et al. (2010) Association of hospitalization for infection in childhood with diagnosis of autism spectrum disorders: a Danish cohort study. Arch Pediatr Adolesc Med 164: 470– 477.
[25]. Atladottir HO, Thorsen P, Ostergaard L, Schendel DE, Lemcke S et al. (2010) Maternal infection requiring hospitalization during pregnancy and autism spectrum disorders. J Autism Dev Disord 40: 1423–1430.
[26]. Norgaard M, Nielsen RB, Jacobsen JB, Gradus JL, Stenager E et al. (2011) Use of penicillin and other antibiotics and risk of multiple sclerosis: a populationbased case-control study. Am J Epidemiol 174: 945–948.
[27]. Boksa P (2010) Effects of prenatal infection on brain development and behavior:a review of findings from animal models. Brain Behav Immun 24: 881–897.
[28]. Selina H Banu, Naila Z Khan, et. al., Profile of Childhood Epilepsy in Bangladesh: 2003 (Internet)

Chowdhury SH, etal. "Pregnancy Related Factors Associated with Epileptic & Non-Epileptic Children." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 19(2), 2020, pp. 19-25.