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DYSLEXIA IN SCHOOL CHILDREN

Neurology

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ABSTRACT

Aim: To study about the role of EEG and urine metabolic screening in school children facing Dyslexia.

Methods: This study is prospective analytical study carried out in Bethesda Hospital, Erode, from August 2016 to December 2017. Dyslexic children's Antenatal, Natal, Post Natal, Childhood and Adolescence risk factors were analyzed. Electroencephalography, urine metabolic screenings were done to all dyslexic childrens. EEG changes were analyzed.

Results: This study is done in 50 dyslexic school children with means age 10.37years. Incidence is males (72%), females (28%). Among 50 dyslexic children 38 childrens showed statistically significant EEG changes (P<0.0001) focal changes showed statistically significant (P<0.0001) value. Statistical analysis revealed High risk childrens showed statistically significant EEG changes (P<0.001). Antenatal risk factors (P<0.03), Intranatal risk factors (P<0.04), Newborn risk factors (P<0.04), Infant risk factors (P<0.03), Childhood risk factors (P<0.002), showed statistically significant EEG changes in dyslexic children. Epilepsy children had statistically significant EEG changes (P<0.001). Urine metabolic screening was negative in all dyslexic children.

Conclusion: EEG in dyslexic children showed statistically significant EEG changes. Urine metabolic screening in dyslexic children was not significant. Appropriate prevention and management of Antenatal, Intranatal, New born, Infant, Childhood and Adolescence risk factors helps in decreasing the burden of Dyslexia in the school childrens.

KEYWORDS

Dyslexia, EEG changes, risk factors.

INTRODUCTION:

Dyslexia also known as learning disorder is characterized by difficulty in reading, spelling words, writing words and understanding others reading it affects 3-7 % of the population through the world, both men and women are equally affected.

AIM:

To study about the role of EEG and urine metabolic screening in School children facing Dyslexia.

METHODS:

This study is prospective analytical study carried out in Bethesda Hospital, Erode, from August 2016 to December 2017. Dyslexic Children's Antenatal, Natal, Post Natal, Childhood and Adolescence risk factors were analyzed. Electroencephalography, urine metabolic screenings were done to all dyslexic childrens. EEG changes were analyzed.

RESULTS:

This study is done in 50 dyslexic school children with means age 10.37years. Incidence is males (72%), females (28%). Among 50 dyslexic children 38 children showed statistically significant EEG changes (P<0.0001) focal changes showed statistically significant (P<0.0001) value. Statistical analysis revealed High risk children showed statistically significant EEG changes (P<0.001).

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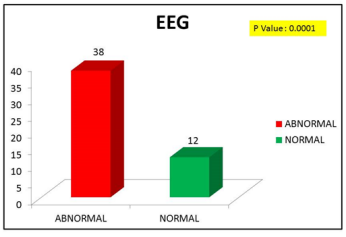
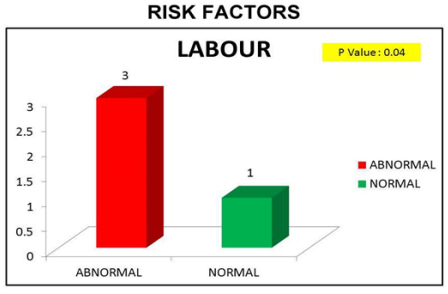
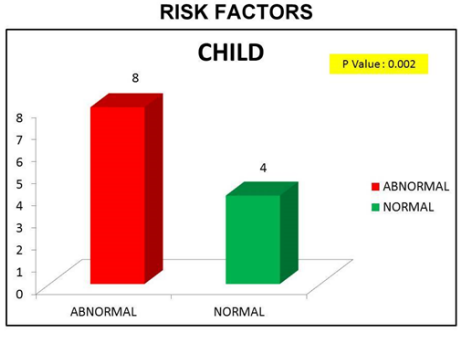
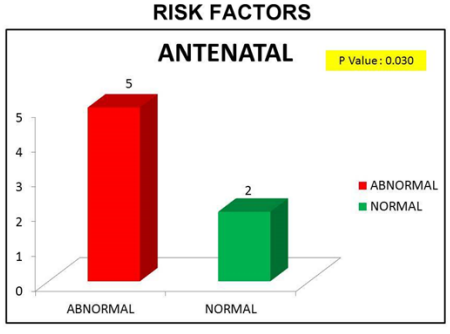
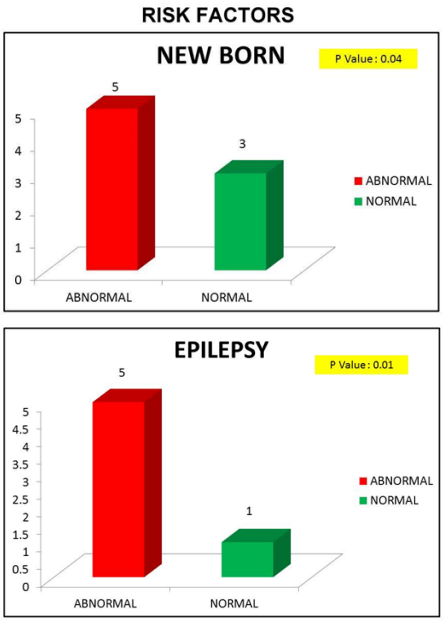










DISCUSSION:

Dyslexic children will be having normal intelligence with learning difficulty. This is considered as a cognitive disorder, may present with secondary emotional problems.

Dyslexia often accompanied by dysgraphia, attention deficit hyper activity disorder, auditory processing disorder, developmental coordination disorder. Dyslexic children shows less electrical activation in areas of brain associated with learning such as left inferior frontal gyrus, inferior parietal lobule, middle and ventral temporal cortex. Neuro imaging such as function magnetic resonance imaging FMRI and positron emission tomography showed functional and structural differences in the brains of children with dyslexia.

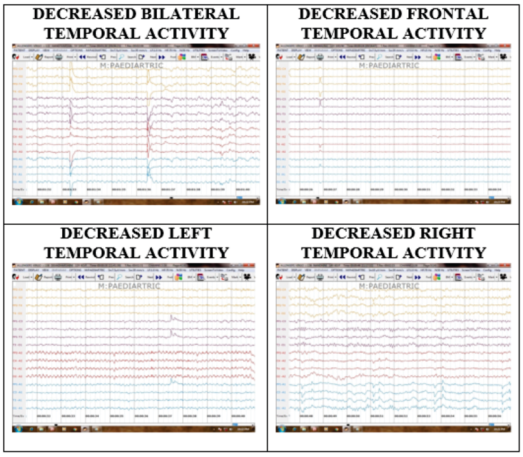
Dyslexic children required special care since early age. Prognosis is good if identified in childhood with proper rehabilitation support.

Brainwave testing can help in diagnosis of dyslexia before kids learn to start reading. According to the study done by dutch dyslexia program Electroencephalography waves are biomarkers in brains of dyslexic children[5,6]. The researchers found that poor reading skills strongly related with high activity in the delta frequency band (0.5-2 Hz) low activity in the alpha band (6-8Hz).

Urine metabolic screening in children may help in detecting inherited metabolic disorder associated with neurological illness.

Here we studied the role of electroencephalography and urine metabolic screening, antenatal, Perinatal, neonatal, risk factors, associated with dyslexia.

EEG RECORDS



Mean age in our study in Dyslexic school children is 10.37 years. Male predominance is noted (72%).EEG showed focal changes in temporal, frontal and parietal were predominantly noted.

Dyslexic children in EEG showed decrease in alpha, beta activity with increase in theta and delta wave forms. Combined network changes such as frontotemperoparietal changes also noted.[1,2,3,4]

Antenatal risk factors includes hypertension, anemia, hyperemesis, ecclampsia, abortificient use were noted. Intranatal risk factors includes preterm delivery, perinatal asphyxia were noted. New born risk factors includes sepsis, neonatal jaundice, low birth weight, IUGR, neonatal seizures. Infant risk factor includes developmental delay, seizures, sepsis.

Child hood risk factor includes epilepsy, CNS infection, malnutrition, seizures, and genetic factors. High risk dyslexic children showed statistically significant EEG changes. Urine metabolic screening was negative in all dyslexic children.

CONCLUSION

EEG waves are biomarkers in dyslexic children[5,6]. EEG in dyslexic children showed statistically significant changes. Urine metabolic screening in dyslexic children was not significant. Appropriate prevention and management of Antenatal, Intranatal, New born, Infant, and Childhood factors helps in decreasing the burden of Dyslexia in the school childrens.

BIBLIOGRAPHY

1. Different brain activation patterns in dyslexia children: eveidence from EEG power and coherence patterns for the double-deficit theory of dyslexia. Arns M et al, J Integr Neurosi 2007 Mar;6(1);175-90
2. Brain plasticity in developmental dyslexia after phonological treatment: A beta EEG band study – Barbara Penolazzi et al – Behavioral Brain Research Vol 209, Issue 1, May 2010, Pages 179-182
3. EEG spectra in dyslexic and normal readers during oral and silent reading – D Galin et al – Electroencephalography and clinical neurophysiology Vol 82, Issue 2, feb 1992, Pages 87-101
4. Resting state EEG hemispheric power asymmetry in children with dyslexia – Eleni A et al, Front pediatr. 2016: 4:11
5. Brainwave testing can help diagnose dyslexia before kids learn to read – Jordan Pearson et al, motherboard.vice.com Sep 3,2014
6. Dyslexia and EEG evidence – its all there in the brain – Mark Christensen et al, March 15,2017