

COMPARATIVE ANALYSIS OF NYSTAGMUS TYPES IN AICARDI SYNDROME

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ABSTRACT:

Nystagmus is an expected neurological condition where involuntary rhythmic oscillations of the eyes is present usually, most of the time Aicardi Syndrome is associated with Nystagmus. Aicardi Syndrome is a dominant in females and it is a neuro developmental disorder and frequently associated with nystagmus also. The aim of this study was comparison of two prevalent nystagmus types and that is Pendular Nystagmus and To-and-fro Nystagmus in individuals with Aicardi Syndrome.

Methods:

It is a cross sectional study and included 60 participants with Aicardi Syndrome. Among of the participants 40 were Pendular Nystagmus and 20 were To-and-fro Nystagmus group associated with considerable clinical features like abnormal visual function outcomes and ocular anomalies.

Results:

In this research gender predominance was found and it is females are more in Pendular Nystagmus as compare to To-and-fro Nystagmus. Here considerable visual parameters are affected and among of them V/A is more affected in To-and-fro Nystagmus as compare to Pendular Nystagmus. Here contrast sensitivity scores were lower in To-and-fro Nystagmus as compare to Pendular Nystagmus.

Conclusion:

This study shows total comparative analysis of types nystagmus in Aicardi Syndrome and it highlights about the characteristics of visual parameters. In Aicardi Syndrome most of the time nystagmus is present and of its subtypes characteristics was assured to know. By this extensive study we are came to know about specific clinical management of nystagmus with Aicardi Syndrome. Further research is essential for more knowledge of genetic and neurodevelopmental information.

Keywords: Aicardi Syndrome, Pendular Nystagmus, To-and-fro Nystagmus. Medical, Society, healthy lives, healthy lifestyle.

INTRODUCTION:

Nystagmus is an involuntary rhythmic to and fro ocular manifestation of the eye usually most of the time associated with neurological disorder with Aicardi Syndrome ^[1,2]. Usually, Aicardi Syndrome is a genetic disorder, predominant in female and characterised by corpus callosum agenesis, infantile spasms, and anomalies of ocular system ^[6]. Among the ocular anomalies, Nystagmus plays an important role for it means most profound in this syndrome.

In Aicardi Syndrome usually two types of nystagmus are found that is- Pendular nystagmus and to and fro nystagmus ^[9]. In these nystagmus variations are found in characteristics and in clinical features and impact on visual function also. Pendular nystagmus is a continuous eye movement with equal speed in each direction ^[13]. Whereas to-and-fro nystagmus having fast and slow phases with back-and-forth movement pattern. Its mechanism is different and usually neural association is found with neural circuitry and motor control ^[21].

Despite low prevalence rate for the same, distinct visual implications are found with pendular and to-and-fro nystagmus with Aicardi Syndrome ^[22]. Here try to seeks gap by comparative analysis between specified two types of nystagmus in individuals with Aicardi Syndrome. By the extensive study came to know the variant clinical features between two nystagmus and came to assured that variation in eye movement pattern, visual function, ocular anomalies make it unique features of each specified nystagmus type ^[16]..

METHODOLOGY:

It is a cross-sectional study design with comprehensive comparative analysis was held in this study. In this study it is focused on the characteristics on the features of pendular and to-and-fro nystagmus patterns. A sampling technique was purposive and collected participants was from specialized clinics or hospitals with all kind of features of Aicardi Syndrome. Inclusion criteria covers of all ages, no gender variations with Aicardi Syndrome. In this study 60 individuals with Aicardi Syndrome are included and among of them 40 individuals were pendular nystagmus and 20 individuals were to-and-fro nystagmus.

Exclusion criteria includes associated with another severe features of another syndrome with considerable cognitive issues in general or ocular system. All medical records were reviewed of the considered patients with all demographic data, clinical history and profile of genetic issue. Detailed nystagmus evaluation was done with thorough eye movement assessment with video-oculography, and infrared eye tracking. Here amplitude, frequency, identification of null points was assessed for nystagmus. During nystagmus visual function was assessed thoroughly and among of them V/A, CS and CV was assessed properly. Descriptive statistics were used for summarization of demographic parameters. A comparative analysis was done between these two types of nystagmus with appropriate statistical test such as Chi square for categorical variables and t-tests for continuous variables. Corelative analysis was done between two nystagmus types, outcomes of visual functions and ocular anomalies. Here ethical guidance was followed and

informed consent from the patient have taken. Ethical approval has taken with international review board before data collection.

RESULTS:

Here 60 individuals were included and among of them 40 were Pendular Nystagmus and 20 were to-and-fro nystagmus. Prevalence rate of females was high in Pendular Nystagmus that is 70% and 30% in male. Prevalence rate of females was high in to and fro Nystagmus that is 75% and 25% in male. In this study it is observed that nystagmus is more affected in females and that is 75% in to-and-fro nystagmus group and similarly males were more affected in Pendular nystagmus group and that is 25%.

In this study assessment of V/A was done between two nystagmus and there mean LogMAR value in Pendular Nystagmus group is 0.76 and SD is 0.24, for to-and-fro nystagmus group mean value is 0.85 and SD is 0.31.

In this study assessment of CS was done and showed that mean value is lowest in Pendular Nystagmus group as compare to to-and-fro nystagmus group. In to-and-fro nystagmus group the mean value was 1.7 and in Pendular Nystagmus group was 1.9.

Here colour vision deficiencies were found and in Pendular Nystagmus group it is 45% and in to-and-fro nystagmus group it is 55%. So, it is observed that to-and-fro nystagmus group is affected more as compare to Pendular Nystagmus group.

It is observed that Chorioretinal lacunae were present 55% in Pendular Nystagmus group and 60% in to-and-fro nystagmus group.

It is observed that Hypoplasia was present 35% in Pendular Nystagmus group and 40% in to-and-fro nystagmus group.

Here some correlational analysis was done between nystagmus amplitude and V/A in Pendular Nystagmus group. Negative correlation was found and $p < 0.05$ and $r = -0.37$, observed poorer V/A was with higher nystagmus amplitude.

Table 1: Participant Demographics Data

Characteristic	Pendular Nystagmus (PN)	To-and-Fro Nystagmus (TFN)
Age (years)	Mean $\pm$ SD: 10.4 $\pm$ 3.2	Mean $\pm$ SD: 11.9 $\pm$ 4.1
Gender (female/male)	28/12	15/5

Table 1 depicted the mean and SD age variation of these two specified nystagmus and it is consequently are: Mean $\pm$ SD: 10.4 ± 3.2 and 11.9 ± 4.1 . Here gender details are followed of this two specified nystagmus in this table.

Table 2: Outcomes of Visual Function & anomalies of ocular system

Outcome	Pendular Nystagmus (PN)	To-and-Fro Nystagmus (TFN)
Visual Acuity (logMAR)	Mean $\pm$ SD: 0.76 ± 0.24	Mean $\pm$ SD: 0.85 ± 0.31
Contrast Sensitivity	Mean $\pm$ SD: 1.9 ± 0.3	Mean $\pm$ SD: 1.7 ± 0.4
Color Vision Deficiency (%)	45	55
Chorioretinal Lacunae (%)	55	60
Optic Nerve Hypoplasia (%)	35	40

Table 2 depicted the V/A, CS, CV, Chorioretinal Lacunae (%), Optic Nerve Hypoplasia (%). Here it is showed that in Pendular Nystagmus group the consequently the data are Mean $\pm$ SD: 0.76 ± 0.24 , Mean $\pm$ SD: 1.9 ± 0.3 , 45, 55, 35. In To-and-Fro Nystagmus group the consequently the data are: Mean $\pm$ SD: 0.85 ± 0.31 , Mean $\pm$ SD: 1.7 ± 0.4 , 55, 60, 40.

DISCUSSION:

This study provides valuable information about the characteristics of Pendular Nystagmus and to-and-fro Nystagmus in individuals with Aicardi Syndrome and affects the outcome of the visual function and ocular anomalies. Here very briefly and specifically discussed about the characteristics of the Aicardi syndrome of ocular anomalies in below.

Characteristics of Nystagmus:

In this syndrome both pendular and to-and-fro nystagmus types were present with variable clinical feature. In female Pendular nystagmus were most prevalent in Aicardi syndrome.

Outcomes of Visual Function:

In this study it is found that higher mean value of LogMAR visual acuity is in to-and-fro nystagmus group. Here low contrast sensitivity is found in to-and-fro nystagmus group as compare to others. Colour vision deficiencies were found in two group nystagmus but more deficiencies were in to-and-fro nystagmus group.

Correlation Analysis:

In Pendular nystagmus group negative correlation was found between nystagmus amplitude and visual acuity.

Clinical Implications:

Significant clinical implications were found for the management and visual functions with Aicardi syndrome. Considerable variations were found in visual acuity, contrast sensitivity, and prevalence of ocular anomalies between pendular and to-and-fro nystagmus types.

Limitations of the study:

Several limitations were found in this study and that is, it is cross sectional-based study and comparatively low sample size. Additionally other variables like severity and age, doesn't fulfil the scope of the study.

Future Directions:

It is a most important study and need to continue the study for more information with relevant parameters. Expected longitudinal study will provide more information for the same.

CONCLUSION:

In conclusion, our study shows in Aicardi syndrome usually there are two types of nystagmus were found with different clinical features which impact quality of life also. In this study it is concluded and came to know that which nystagmus is more affect the visual function.

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