



Original Article

Evaluation and Management of Nystagmus

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Purpose: To evaluate clinical features of nystagmus in detail and find out best management with different options.

Method: A descriptive cross-sectional study was conducted among people having nystagmus. A total of 70 patients presented to orthoptic clinic were examined. Visual acuity, Refraction, Fundoscopy, Binocular single vision, stereopsis, ocular motility and nystagmus evaluation were done by using ETDRS, Retinoscope, Ophthalmoscope, W4 dot, and Lang 2 pencil respectively.

Results: The most common type of nystagmus was congenital idiopathic motor nystagmus (95.71%) and 4.29% were having sensory defect nystagmus. Concerning refractive error, 42.9% were hypermetropes, 34.3% were myopes, 12.9% had compound refractive error and 10% were emmetropes. 90% of the patients had fundus within normal limit, 1.4% had age related macular degeneration and 8.6% had ocular albinism. Many patients had associated strabismus comprising 35.71% with esodeviation, 30% with exodeviation, 5.71% had hyperdeviation and 28.57% were orthophoric. 62.29% were managed by giving spectacle correction, 5.71% with contact lenses, 5.71% with low vision aids and prisms correction and 14.29% were further referred for surgical management.

Conclusion: Detailed examination of nystagmus including visual acuity, Refractive error, Binocular single vision, and strabismus helped in accurate diagnosis of nystagmus and these patients were benefited by different management options including spectacles, contact lenses, low vision aids, prisms and surgery.

Key words: Nystagmus, Management

Introduction:

Nystagmus is defined as the involuntary movements of the eyes, which are the cause of reduction of visual acuity because image is moving in excessive motion on the retina. These can be grouped into infantile which is seen in first 6 months of life. And one which appear later. Some different types of factors which are associated with them are albinism, low vision and loss of vision due to abnormality of lens, retina and other disorders of brain. In evaluation of these forms clinician should consider time of onset and waveforms and any asymmetry.¹

Nystagmus is classified as:

1. Idiopathic
2. Manifest-Latent
3. Sensory forms
4. Spasmus nutans
5. Associated with intracranial diseases.²

There are different causes of nystagmus which make the condition worse like someone having family history, lack of color and pigmentation in skin. And many problems of eyes like cataract and strabismus and inner ear disorder which can be due to degenerative and road traffic accident. And use of medicines which are aggravating factors.³

Before evaluation, there should be observation of certain anomalies like head posture, color vision, fusion, stereopsis, optic nerves, pupillary reaction and lid abnormalities. These factors are mostly associated with involuntary movements. Examiner should determine any limitations in range of extraocular muscles by motility. The best way to observe the movements with high convex with small light which prevent fixation of objects and also provide magnified view of eyes of patient and other way consists of transiently covering the fixating eye with ophthalmoscope in the dark room and the effects on the foveal motion is being viewed.

History taking is very important and should be the first step and physical examination to determine whether it is by birth or later. Visual acuity measurement should be done which depends upon age, cooperation and mentally behavior or status of the patient. It will be qualitative in nonverbal or uncooperative childlike preferential looking, matching of symbols and letters with LEA or HOTV optotypes can be used. In verbal and cooperative patient Snellen or ETDRS charts can be used. In both of these charts ETDRS is more accurate and widely used than snellen. Mostly this is been used in patients having nystagmus and amblyopia.⁴

Latent form of nystagmus is typically seen in children. In early life refractive correction can reduce intensity and convert manifest latent into latent latent and can improve visual acuity. And management of lazy eye associated with

hidden form deserves special consideration as this will worsens the vision monocularly during occlusion therapy. And is often connected with significant head turn towards fixating eyes which is often seen in a coexisting large angle squint.⁵

Color vision defects are also associated with onset of nystagmus and can be measured with different tests and by this indication of any type of dystrophies in cones can be detected. Any defects in anterior segment like Trans illumination defects should be identified, any anomaly like corneal opacity, iris and pupil problems can be ruled out with biomicroscopy. And it can provide better magnification and understanding of amplitude and frequency of eyes oscillations.⁶

In early life about 90 percent of cases are due to abnormalities of sensory visual pathways. It is associated to afferent pathway deficits and involuntary moving of eyes associated to retinal defects and other diseases in which vision is deprived.

Children with a low birth weight or who require special care unit for longer than 24 hours at birth are seven times more likely to have nystagmus. So that it is necessary to evaluate this factor if parents complain about premature birth and onset of this involuntary movements of eyes are results from this factor or by any other before making diagnosis.⁷

The prevalence of nystagmus in general population in unknown but has been estimated to be 24 per 10,000. The most common forms were neurologic and associated with congenital defects such as achromatopsia. And within groups was significantly more common in the white European population than in the Asian population. In general, acquired nystagmus and saccadic oscillations cause oscillopsia and nausea and vertigo.⁸

To further characterize nystagmus, eye movement recordings and description of waveforms are utilized. A variety of developmental and neurological syndromes are associated, such as Down's syndrome, and microcephaly. These are usually related to abnormalities in the brainstem and cerebellum. Many patients also have associated with headaches due to elevated intracranial hypertension. Ocular signs, such as relative afferent pupillary defect, papilledema, optic atrophy, and visual loss may also be present.⁹

Materials and Method:

A descriptive cross sectional study was conducted among people having nystagmus. A total of 70 patients having nystagmus, presented to orthoptic clinic were examined. Clinical data including, Visual acuity, Refraction, Fundoscopy, Strabismus, Binocular single vision status, Stereopsis, ocular motility, Diagnosis and management, for each respondent data was collected from the hospital chart and was entered in a data collection sheet. Patients were examined in detail and their accurate diagnosis was made and all the data was

collected with self-designed Performa. Statistical analysis were performed using SPSS 22.0 for Windows software SPSS. We produced descriptive statistics and frequency distribution plots for all parameters included in the analysis.

Results:

The most common type of nystagmus was congenital idiopathic motor nystagmus (95.71%) and 4.29% were having sensory defect nystagmus. Concerning refractive error, 42.9% were hypermetropes, 34.3% were myopes, 12.9% had compound refractive error and 10% were emmetropes. 90% of the patients had fundus within normal limit, 1.4% had age related macular degeneration and 8.6% had ocular albinism. Many patients had associated strabismus comprising 35.71% with esodeviation, 30% with exodeviation, 5.71% had hyperdeviation and 28.57% were orthophoric. 62.29% were managed by giving spectacle correction, 5.71% with contact lenses, 5.71% with low vision aids and prisms correction and 14.29% were further referred for surgical management.

Figure 1:

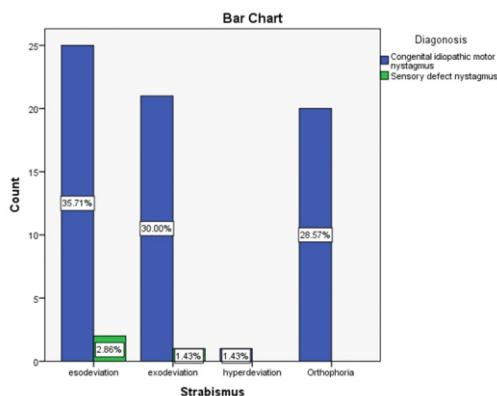
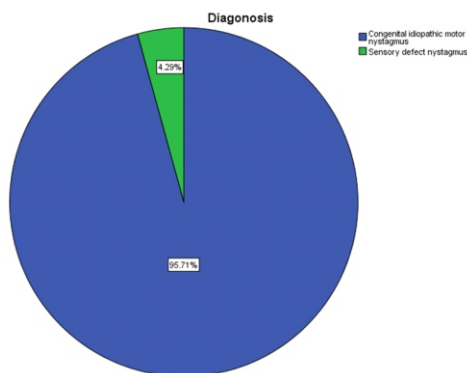
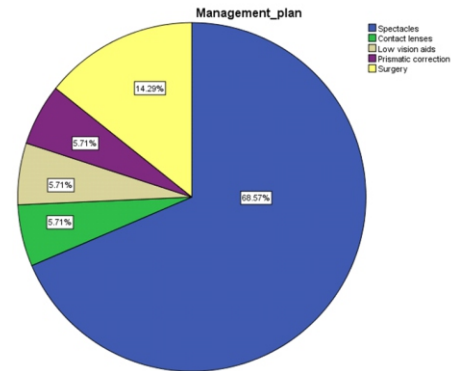


Figure 2:



Overall among the 70 patients, 95.71% had congenital idiopathic motor nystagmus and 4.29% had sensory defect nystagmus.

Figure 3:



Overall among 70 patients, most of the patients 68.57% were prescribed spectacle correction, 5.71% were given contact lenses, 5.71% were prescribed low vision aids and prisms correction and 14.29% were further referred for surgical management.

Table 1: Management Plan

		Diagnosis		Total
		Congenital idiopathic motor nystagmus	Sensory defect nystagmus	
Management plan	Spectacles	45	3	48
	Contact lenses	4	0	4
	Low vision aids	4	0	4
	Prismatic correction	4	0	4
	Surgery	10	0	10
Total		67	3	70

Discussion:

This study outlined the general examination procedures and findings of a male teenager with congenital nystagmus involving treatment strategy. The treatment included maximum refractive correction with compensatory prism and a vision therapy, as well as experimental use of soft contact lenses. Improvements included increased visual acuity, reduced nystagmus, markedly improved near point of convergence, increased stereo acuity, much greater control of the exotropia, and improved cosmesis. Objective eye movement recordings were taken at the end of therapy to illustrate the differential effects of the treatment methods on nystagmus reduction. The results demonstrate the efficacy of such a multi-faceted approach in the clinical treatment of congenital nystagmus.

In this study, Forty-six patients with congenital

nystagmus were studied. Each patient received a neuro-ophthalmic examination to measure visual functions, such as ocular albinism, chorioretinal scars, and optic atrophy. Twenty-eight patients had no other associated ocular lesion that could be the possible cause of deprivation of vision and were classified as motor-defect nystagmus, as described by Cogan. Visual acuity ranged from 20/25 to 20/60 in this group of patients (average 20/40). Eighteen patients with ocular lesions were classified as having sensory-defect nystagmus. Their visual acuity ranged from 20/40 to 20/400 (average 20/100).

In this study on detailed examination of nystagmus including visual acuity, refractive error, funduscopy, and Binocular single vision status were done. Most of patients were congenital idiopathic motor nystagmus 95.71% and they could be benefitted by prescribing refractive correction because by correcting refractive error by prescribing spectacles, vision improves in 68.57% of patients and intensity of nystagmus was reduced. Those patients who had head posture were benefitted by prescribing prisms (Conjugate prisms), by moving the eyes towards null zone according to their head posture. And those with very poor vision could be benefitted with low vision aids including hand held magnifiers, telescopes, stand held magnifiers, by using these instruments their daily life activities could be improved. Contact lenses could be prescribed in those patients who have high refractive error and high intensity nystagmus because contact lenses provide larger field of view and move with the eye so that chromatic aberration are reduced and prismatic effect is not produce.

The study of waveform showed that most of the patients having nystagmus had jerky form of waveform (88.6%) and less common were pendular waveform (11.4%). Concerning about frequency of nystagmus among those were evaluated in this study showed that (47.1%) had moderate frequency nystagmus and (32.9%) had low frequency nystagmus and (20%) had high frequency nystagmus. Evaluation of amplitude of these patients showed that (41.4%) had small amplitude of nystagmus and (38.6%) had medium amplitude and (20%) had large amplitude of nystagmus. Those patients who had null zone in right gaze were (20%), those who had in left gaze were (10%) and 70% of the patients had absent or no null zone. This null zone indicates that patient visual acuity could be improved if his/her eyes moved towards their null zone by placing conjugate prisms or by performing surgical procedure like kestenbaums procedure.

In this study, results shows that mostly patients having nystagmus were congenital idiopathic and were managed mainly by prescribing spectacle correction and other options of management including contact lenses could be prescribed if spectacles are not suitable to the patients or in those who had high refractive error.¹⁰ Low vision aids could be

choice of treatment in those who had very poor visual acuity. Prismatic correction could be prescribed to those who had head posture and null zone and could be benefitted for them. Causes of Visual Impairment in Children with Low Vision.¹¹

Regarding management of nystagmus, certain drugs like beclufen should be trialed to check the effectivity of these drugs on intensity of nystagmus.¹²

Due to shortage of time, this management option was not included in this study. But these drugs could be the mainstay treatment in the patients of nystagmus if they improve visual acuity by reducing intensity of nystagmus oscillations. So that further study should be done on broad spectrum to evaluate the effect of these drugs on nystagmus, so that patients could be benefitted with these drugs.

Conclusion:

Detailed examination of nystagmus including visual acuity, Refractive error, Strabismus, Binocular single vision status helped in accurate diagnosis of nystagmus and these patients were benefitted by different management options including spectacles, contact lenses, low vision aids, prisms and surgery. Ophthalmologists considered different optometric services, very useful for the community and eye care profession. The study showed that optometrists were performing their duties very well. Ophthalmologists were reluctant about services in glaucoma co-management and disease diagnosis. Optometrists should involve in the provision of enhanced services to patients like optometrists in the UK who are participating in enhanced services scheme (ESS). Optometrists provide high-quality services that are greatly accepted and appreciated by patients, health professionals, and the community. There is still an extensive area for optometrists to work on.

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