

Original Article

Pseudomyopia : Is it an Underdiagnosed Cause of Asthenopia?

Ruchi Kabra¹, Hemaxi Desai², Krupali Rao³, Saloni Shah⁴, Riddhi Gajjar⁵, Akanksha Patel⁶, Ronak Bhanat⁷

Introduction : Pseudomyopia is a temporary form of myopia and presents as a rather short-sighted subject Refraction compared to the corresponding objective refraction.

Objectives : The objective of this study is to evaluate and diagnose Pseudomyopia patients visiting Ophthalmology OPD with asthenopic symptoms.

Methodology : It is a prospective cross-sectional study of 177 patients (354 eyes) presenting with asthenopic symptoms like Headache, Eye ache, Watering and Eye strain from January 2021 to June 2021. These patients were subjected to a detailed ophthalmic examination that included best-corrected visual acuity, cycloplegic retinoscopy, subjective correction, post mydriatic test, slit-lamp biomicroscopy and fundus examination.

Results : Of the 177 asthenopic patients, 18% emmetropic, 32% myopic, 4% hypermetropic, 24% astigmatic and 22.5% pseudomyopic patients were identified. Asthenopia is found to be significantly associated with Pseudomyopia (P<0.02). Apart from refractive errors, Pseudomyopia is also an important cause of Asthenopia.

Conclusion : Cycloplegic refraction is required to identify these patients and subsequently treat them with ocular exercise, counselling and lifestyle modifications.

[J Indian Med Assoc 2023; 121(5): 41-3]

Key words : Pseudomyopia, Asthenopia, Cycloplegic Refraction.

Pseudomyopia is a temporary form of Myopia and presents as a rather short-sighted subject Refraction compared to the corresponding objective refraction¹. Patients with Pseudomyopia have dimness of vision for distance, which generally worsens after tedious close-up work as a result of the ciliary muscle contraction². Pseudomyopia can also generate asthenopic symptoms, ie, Eyestrain, Watering, Headache, Fatigue and other Non-specific complaints due to an imbalance in the autonomous nervous system that is responsible for regulating accommodation². Pseudomyopia like presentation can occur in certain conditions like extreme close up work, uncorrected Hypermetropia, emotional stress and conditions leading to accommodative spasms^{1,3,4}. Treatment modalities for Pseudomyopic patients include is cycloplegics, eye exercises and glasses of lower power. If the result is not obtained with cycloplegics, then an extensive course is advocated^{5,6}.

Department of Ophthalmology, GCS Medical College, Hospital & Research Centre, Ahmedabad, Gujarat 380025

¹MBBS, MS (Ophthalmology), Associate Professor

²MBBS, DO, MS (Ophthalmology), Professor and Head of the Department and Corresponding Author

³MBBS, MS (Ophthalmology), Assistant Professor

⁴MBBS, MS (Ophthalmology), Senior Resident

⁵MBBS, Second Year Resident

⁶MBBS, Second Year Resident

⁷MBBS, Third year Resident

Received on : 10/06/2022

Accepted on : 06/09/2022

Editor's Comment :

- Pseudomyopia is also a kind of refractive error which is associated with asthenopic symptoms so it should not be ignored.
- All patients must be examined with cycloplegic refraction based on their age as pseudomyopia is a major type of under diagnosed refractive error.
- If diagnosed, it is easy to treat with simple treatment like ocular exercise, glasses, counseling and lifestyle modification.

AIMS AND OBJECTIVES

- To find out the prevalence of underdiagnosed Pseudomyopia from patients having asthenopic symptoms
- To create awareness and treat Pseudomyopia

MATERIALS AND METHODS

The present prospective cross-sectional study was organized in the Department of Ophthalmology at GCS Medical College, Hospital and Research Centre, Ahmedabad for a period of 6 months. 354 eyes of 177 patients were included in the study. Institutional Ethics Committee approval was obtained and informed consent was taken.

The inclusion and exclusion criteria for our study are as follows.

Inclusion Criteria :

All the subjects with asthenopic symptoms in the age group 5-35 years were selected for the study.

Exclusion Criteria :

Participants with extremes of age (<5 years and >70 years) were not included in this study.

Participants with Pseudophakia, Presbyopia, Strabismus, Amblyopia or any other established Ophthalmic pathology were excluded from this study. Subjects with any known systemic illness or immunocompromised states were not included in the study.

All the selected participants were evaluated in detail. Factors like occupation and previous medical, surgical and ocular history were noted. All the collected information was recorded in prestructured Performa. Following that, a detailed ocular examination was carried out after taking consent. Tests included unaided visual acuity (Snellen’s chart), best-corrected visual acuity (Snellen’s chart), post mydriatic test, NPC (Near Point of Convergence), FPS (Far Point of Convergence), Anterior segment examination done by slit-lamp biomicroscopy, Dilated retinoscopy and Posterior segment examination by indirect ophthalmoscope using 20D. After these assessments, Pseudomyopic patients were diagnosed.

RESULTS

The sex distribution and refractive error data are documented in Fig 1. There was no statistically significant difference noted in gender among all asthenopic patients (Chi-square test $P>0.05$).

Relation of age to asthenopic symptoms is mentioned in Fig 2. There was a statistically significant difference noted in the age group of 18-22 among all asthenopic patients (Chi-square test $P<0.02$)(Table 1).

Out of 177 patients with asthenopic symptoms like Headache, Eye ache, Watering and Eye strain Pseudomyopic patients were having significant Asthenopia in comparison to emmetropic patients ($P=0.0001$) and the same observation was noted

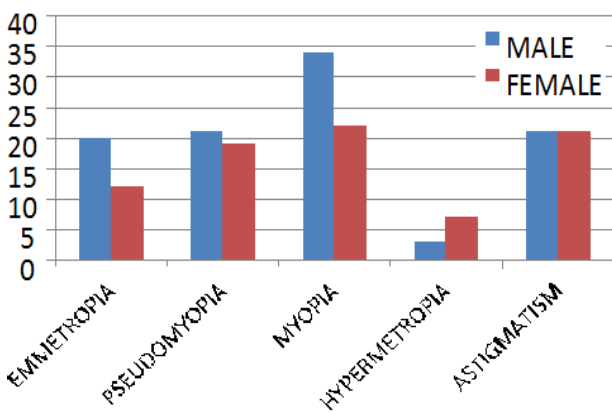


Fig 1 — Sex distribution and type of refractive error

between Pseudomyopia and other refractive errors like Myopia, Hypermetropia and Astigmatism ($P=0.0001$) (Fig 3).

Table 2 showing the relationship of refractive error with post mydriatic test. There was a statically significant difference noted in Pseudomyopic patients among all Asthenopic patients (Chi-square test $P=0.006$).

DISCUSSION

The current study aimed to assess the number of

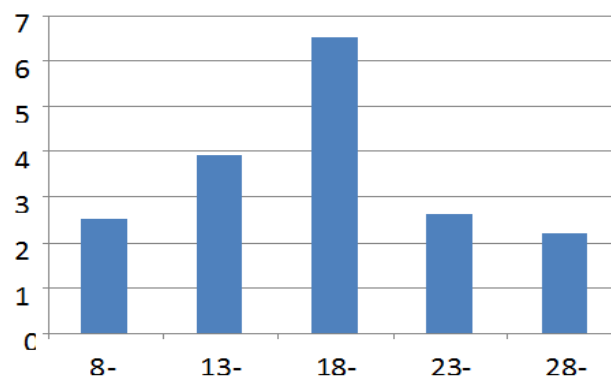


Fig 2 — Relation of Age with Asthenopia

Having Asthenopic Symptoms	Age Group Between 11-30 Years	Rest Age Group In Study Sample	P Value
Pseudomyopia	37	03	40
Total Patients	100	37	137
Total	137	40	177 (<0.02)

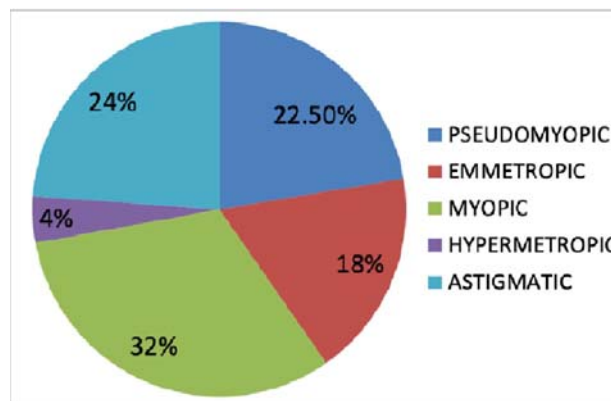


Fig 3 — Relation of Asthenopia with type of Refractive error

Refractive Error	Before Mydriasis	After Mydriasis	P Value
<2DS With Astigmatic Error	25	32	57
>2DS With Astigmatic Error	80	40	120
Total	105	72	177 (0.006)

underdiagnosed cases of Pseudomyopia with Asthenopic symptoms in OPD. In our study prevalence of Pseudomyopia was 22.50% and it was found most commonly in the age group 18-22 years which was comparable to Sweden's study (prevalence – 34.7%, age group – 6-10 years)⁹. No association was found between Asthenopia and sex, skin colour, or economic status in our study which was similar to Sweden's study⁹. In our study, the majority of the subjects were in the working-age group of 20 to 32 years. Though accommodation is known to be more powerful at a younger age, this overactive accommodation could be the cause of Pseudomyopia in the working-age group, depending on their working distance and reading requirements. Khalid K, *et al*, in their study, showed that active accommodation is the main causative factor in Pseudomyopia, Activities that are visually more demanding like reading or using the screen for long hours, especially in the younger age group (20-30 years) play a significant role in Pseudomyopia¹⁰. A variation of $\geq 2D$ in the readings between subjective refraction and retinoscopy is an unusual clinical finding and is generally suggestive of Pseudomyopia. In the current study, retinoscopy values were found to have a mean \pm SD difference of $1.33 \pm 0.59 D$ in comparison to readings subjective acceptance. Also, it was noted that subjective correction values were consistently more myopic. Our findings were is comparable to Jameel, *et al*/study in which the mean \pm SD difference was $1.87 \pm 0.12 D$ ¹¹.

CONCLUSION

There is statistically significant Asthenopia associated with Pseudomyopia as compared to Emmetropia and also with other refractive errors. Hence, Pseudomyopia remains under diagnosed in OPD during the routine ophthalmic examination. Cycloplegic refraction is required to identify these patients and

subsequently treat them with glasses, ocular exercise, counselling and lifestyle modifications.

Limitation :

The main limitation of this study is the assessment of the study population drawn from a specific environment that is (eye OPD of Urban Health tertiary centre). Also, the sample size was small and did not include the pediatric age group. Thus, generalization of the finding for the entire population is not possible.

Support : NIL

Conflicts of Interest : NIL

REFERENCES

- 1 Rutstein RP, Daum KM, Amos JF — Accommodative spasm: A study of 17 cases. *J Am Optom Assoc* 1988; **59**: 527-38.
- 2 J Neuroophthalmol ; 22(1): 15-7.doi:10.1097/00041327-200203000-00005.
- 3 Rutstein RP, Marsh-Tootle W — Acquired unilateral visual loss attributed to an accommodative spasm. *Optom Vis Sci* 2001; **78**: 492-5.
- 4 Faucher C, De Guise D — Spasm of the near reflex triggered by disruption of normal binocular vision. *Optom Vis Sci* 2004; **81**: 178-81. .
- 5 Hussaindeen JR, Mani R, Agarkar S, Ramani KK, Surendran TS — Acute adult onset comitant esotropia associated with accommodative spasm. *Optom Vis Sci* 2014; **91**: S46-51.
- 6 Hussaindeen JR, Ramani KK — Comparison of cycloplegic refraction between retinoscopy, closed field and open field autorefraction in pseudomyopia. *Invest Ophthalmol Vis Sci* 2013; **54**: 570-6.
- 7 Carnevali T, Southaphanh P — A retrospective study on presbyopia onset and progression in a Hispanic population *Optometry* 2005; **76**: 37-46.10.1016/S1529-1839(05)70253-0
- 8 Asharulous A, Hashemi H, Jafarzadehpur E, Mirzajani A, Yekta A, Nabovati P — Does astigmatism alter with cycloplegia? 131-36.10.1016/j.joco.2016.05.00327579457
- 9 Abdi S — Asthenopia in schoolchildren. [Thesis] Stockholm: Karolinska Institutet; 2007. 59.
- 10 Ip JM, Robaei D, Rochtchina E — Prevalence of eye disorders in young children with eyestrain complaints. *Am J Ophthalmol* 2006; **142(3)**: 495-7 .
- 11 Rizwana HJ, Mithra A, Viswanathan S, Krishna Kumar R, Peter A — *Indian Journal of Ophthalmology* 2018; **66(6)**: 799-805.