General Binocular Dysfunction (non-strabismic) in a population of Alribat University Students

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ABSTRACT

Objective: To determine the presence of general binocular dysfunction (non- Strabismic). In a Population of Alribat University Students. **Material and Methods:** A cross ectional- based study was conducted in Alribat University Hospital (Ophthalmic clinic), among Alribat University students during the period from June 2017 to January2018.The Main parameters evaluated include patients complain, visual acuity, Refractive Status. Accommodative assessment and orthoptic report. **Results:** A total of 250 University Students were enrolled in this study; 34% males' and **66**% females, the Mean of age was 19.8±1.78 years.31.2 percentage of the subjects had binocular vision dysfunction and 68.8% Of the subjects had normal binocular vision. 11.6% of subjects had convergence Insufficiency, which represents more prevalent condition, 6% had accommodative Insufficiency while distribution of fusional vergence dysfunction 5.2%, Basic Exophoria and Convergence excess were same prevalent representing 3.6% and 1.2% of subjects had divergence excess. **Conclusion:** binocular vision dysfunction is Prevalent in this population. These Anomalies may cause symptoms of blurred vision, Fatigue, headache, and loss of Concentration.

Key words: Binocular Dysfunction, Accommodation, Convergence Insuffiency, Fusional Vergence

المستخلص:

الهدف: هدفت تقييم حالات طلاب جامعة الرباط الوطني الذين يعانون من هذه الدراسة الي اختلال في الرؤية الموحدة بين العينين والكفاءة البصرية وتصنيفها ومدي انتشارها.

المواد والطرق: هذه دراسة وصفية مقطعية اجريت في ولاية الخرطوم بمستشفي الرباط الجامعي في الفترة من شهر يونيو2017 الي يناير 2018 تستهدف الدراسة كل من لديه حدة بصر سليمة 6\6 وعيون سليمة من الامراض و يشكو من اعراض كالصداع وعدم القدرة علي التركيز.تم اخضاع الطلاب لفحص روتيني كامل شمل كل من قياس حدة البصر باستخدام (لوحة كشف النظر) وفحص الاخطاء الانكسارية (بمنظار الشبكية).

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وشمل ايضا قياس قوة التقارب والتباعد(باستخدام البرزمات والمناشير) ولقياس قدرة التكيف البصري (تم استخدام العدسات المقعرة) و ايضا تم تقييم للرؤيه الموحدة.تم جمع البيانات وتحليلها ببرنامج الحزم الاجتماعية الاصدار20

النتائج: تم فحص عدد 250 طالب وطالبة في هذه الدراسة 85 (34%) ذكور و عدد165 (66%) اناث تراوحت اعمارهم بين 17 -23 سنه بمتوسط 1.78 # 19.8 وأظهرت النتائج ان (171) من مجموع الطلاب لديهم كفاءة بصرية جيدة بنسبة 68.8%. (71)31.2% من مجموع الطلاب يعانون من اختلال وقصور وظيفي في الرؤية الموحدة بين العينين شملت النتائج تشخيصات مختلفة أكثرها شيوعا ضعف في قوة التقارب بين العينين بنسبة 11.6% و6 % منهم لديه قصور في قوة التكيف البصري وحالات اختلال دمج الرؤية بين العينين بنسبة5.2% واظهرت النتائج تساوي بين حالات الحول الخفي الوحشي و الطلاب اللذين لديهم زيادة في قوة التقارب بين العينين بنسبة3.6%.2.%1.2 من مجموع العينات لديهم زيادة في قوة التباعد بين العينين.

الخلاصة: الاختلال الوظيفي في الرؤية الموحدة بين العينين منتشرة في مجتمع طلاب جامعة الرباط بالخرطوم.

الكلمات المفتاحية: الاختلال الوظيفي ، التكيف البصري، الأخطاء الانكسارية، الكفاءة البصرية، الكفاءة البصرية

INTRODUCTION

The biological visual systems have a feature called visual attention, which allows us to Extract the best information from the environment .[1][2] Performance , processing of visual attention and school learning can be affected by visual attention problems.[3] In a properly functioning visual system, the right and left eyes are aligned such that they converge properly on an object viewed, each eye therefore, sends only slightly different image to the brain , making it easy for the brain to combine these two different views into a single interpreted image . The ability to do this is referred to as binocular vision.

Binocular vision dysfunction (BVD) is a condition in which the two eyes are unable to align properly without some effort on the part of the sufferer to correct or compensate for this Misalignment. [4] Patient with binocular vision problems are often symptomatic and require Treatment, in order to maintain a clear single image when reading or doing near work both Accommodative and convergence system smuts be adequate. [1][5] Recent studies estimate That about 20% of cases reporting to optometric clinics is one of binocular vision anomalies. [6]

MATERIAL AND METHODS

Study design- setting: Any subjects whose age between (17-23) years and with VA 6/6 or better, free from Ocular or systemic diseases and had visual or ocular symptoms were induced in this Study. After taking the demographic data, the subject was asked about them main complain, ocular health was investigated (inner and outer) using keeler standard Ophthalmoscope. Then the parameters were taken

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including; Distant VA by snellen's test (Auto chart (Rs 7072) E symbols), In addition, near acuity (at 33cm) by jager test. Refractive status of the eye estimated by Auto Ref/keratometer (Nidex FA - 6500-j). Ocular alignment and degree of deviation and fusional vergence were detected by prism par cover test. Near point of convergence was measured by RAF rule, and accommodation was measured by minus lenses. AC/A ratio were measured by gradient test method. The grades of binocular vision were assessed through the major amblyscope (2002 model.png).

RESULTS

Two hundred and fifty subjects were included in this study; (34% males) and (66% females) the mean age was 19.8±1.78 years, 73.2% Emmetropia, and 26.8% were Ammetropia but their vision was improved up to6/6 with correction.

Table (1.1) shows the amplitude of subjective accommodation (in diopters) according to normal range accommodation (Duane 1922) and (Dusex 2012)

Range (in diopters)	**Percent**
Less than normal	5.2%
Normal range	91.2%
More than normal	3.6%
Total	100%
Mean Std. 7.06±0.95	

Table (1.2) the state of the negative and positive relative accommodation.

State	**Percent**
Normal	82.0%
Low positive relative accommodation	12.4%
Low negative relative accommodation	4.4%
High negative relative accommodation	0.8%
High positive relative accommodation	0.4%
Total	100%

Table (1.3) degree of Distant and near phoria

Range	**Distant phoria/percent**		**Near phoria/percent**		
	Esophoria	**Exophoria**	**Esophoria**	**Exophoria**	**Percent**
(0-4)	0	93.6%	0	84.8%	84.8%
(4-8)	0	5.6%	3.6%	11.6%	15.2%
(8-12)	0	0.8%	0	0	0
Total	-	100%	-	-	100%
Mean Std.	0.34±1.43		1.44±1.43		

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Table (1-4) Fusion positive and negative measures (in degree)

Fusion	Positive/Percent	Negative/Percent
Normal	70.8%	62.8%
Abnormal	29.2%	37.2%
Total	100%	100%
Mean Std	18.9±6.11	5.51±1.10

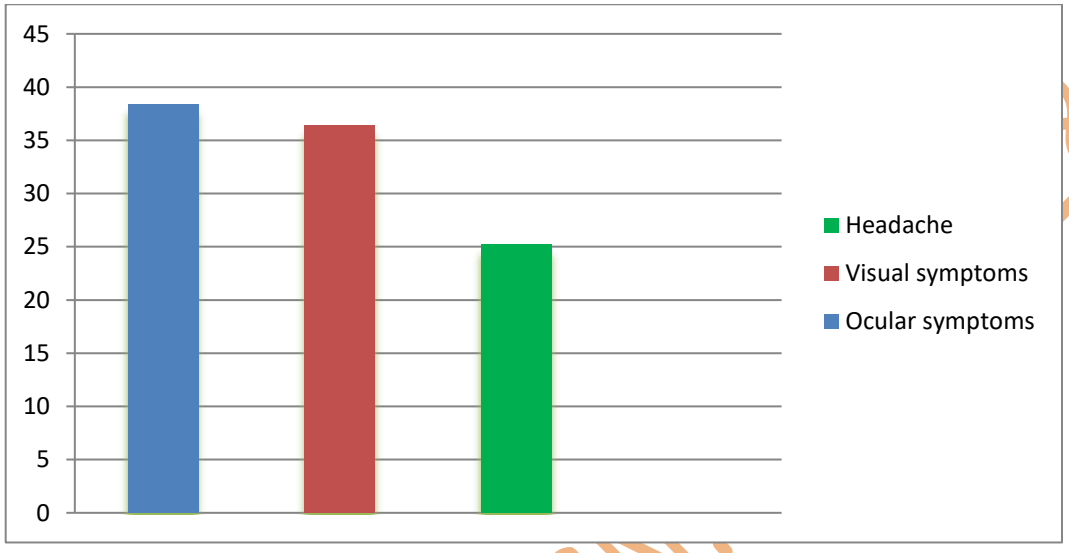

Figure (1-1) show the distribution of symptoms

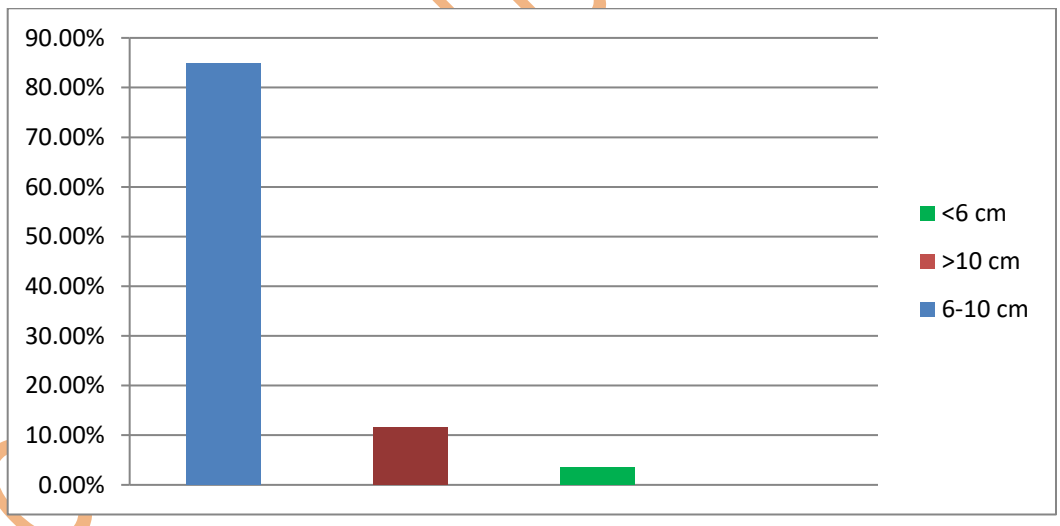

Figure (1.2) near point of convergence measures (in cm)

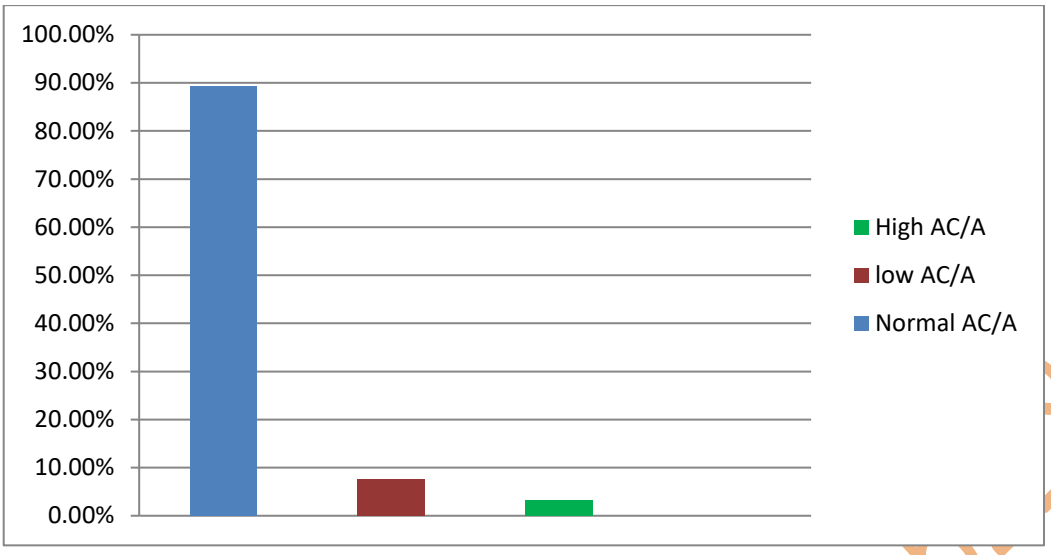

Figure (1.3) the state of Accommodative convergence to accommodation (AC/A)

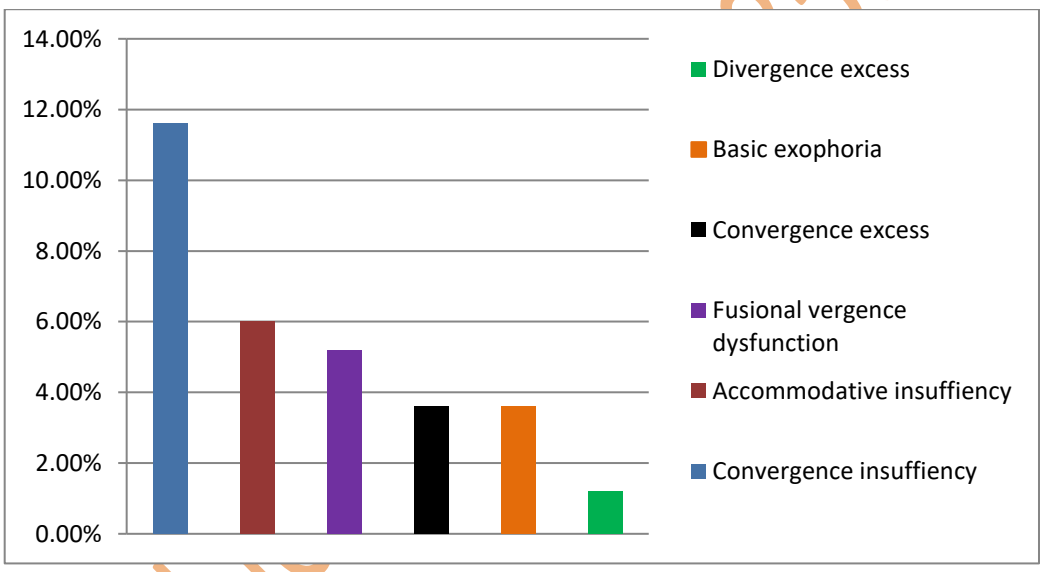

Figure (1-4) distribution of binocular dysfunction

DISCUSSION

This is the cross-sectional study using strict diagnostic criteria and a comprehensive optometric evaluation of the prevalence of non-strabismic and accommodative anomalies in a population of Alribat University Students in Khartoum. The Study finding demonstrated that 31.2% of subjects were diagnosed with Non strabismic binocular vision dysfunction This is similar to other study done by (Palomera-*et al* 1997) [7] who determine the presence and clinical implication of prevalence of binocular dysfunction in population of university students, 32% of subjects showed general binocular

dysfunction. Little another study (Kovarski C- *et al* 2013) show that 24.2% of the subjects presented general binocular dysfunctions in population of university Students.

In our study found convergence, insufficiency was the high prevalent and most common dysfunction detected 11.6%. Six percent of subjects had accommodative insufficiency while fusional vergence dysfunction represent5.2%, Basic exophoria and convergence excess revealed equal distribution (3.6%, for each), and 1.2% of subjects had divergence excess. These finding were compatible with that of; (Goodwin *et al* 2016) [8] who found that 12.7% of subjects diagnosed with convergence insufficiency being the most common vergence dysfunction and (Palomera *et al* 1997) who found 7.7% had convergence insufficiency with accommodative excess.6.2% showed accommodative insufficiency. 3.1% had basic exophoria. And (Abdis, Rydberg 2005) [9] study about prevalence of non-strabismic binocular vision disorders in Patients with Asthenopia, out of 182 subjects, the 142 subjects who had non strabismic binocular vision dysfunction (Cacho MP *et al*. 2009) [10] reported that 15.8% of the subjects presented general binocular dysfunctions, 4.8% presented accommodative dysfunctions, and 9.3% presented vergence dysfunctions, convergence insufficiency was the most prevalent 7.8%. The correlation between the prevalence and progress of binocular dysfunction is strong; people whose increased visual demands during either training or prolonged periods of reading, have higher degrees of symptomatic binocular dysfunction. Our study found 100% of subjects there had symptoms as follow; ocular symptoms represent 38.4%, Visual symptoms 36.4% and 25.2 %of subjects had headache. symptoms, and Headache; these may be caused by prolonged close work and high near visual demand could be the most important factor for higher incidence of binocular dysfunction. As a result, discussed above explained that the prevalence of non-strabismic binocular dysfunctions commonly occurs, this means that the high probability of occurrence of Binocular dysfunctions during ages of universities. [11] [12]

CONCLUSION

Binocular dysfunction results symptoms, which may interfere with university or work performance. In addition, has a negative influence on academic ability, visual efficiency, and performance. Successful treatment leads to a significant improvement in the quality of life of the patients.

RECOMMENDATION

It is important to give a thorough eye examination including tests for binocular vision to detect general binocular dysfunctions, diagnose and treat these anomalies.

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