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### RESEARCH ARTICLE

#### PRIMARY SCHOOL SCREENING FOR AMBLYOPIA IN BAGHDAD

Haifaa Rashid Hamid<sup>1</sup>, Najat Al-Bayatti<sup>2</sup> and Haifaa Abdul-Ghani<sup>3</sup>

1. MB.ChB. MSc. CM. (Corresponding author) Al-Ealam Medical Sector/ Al-Bayaa Primary Health Care Center.
2. MSC.PH Assistant Prof. Department of Community Medicine College of Medicine/Al-Mustansiriya University.
3. FRCS Assistant Prof. Department of Surgery College of Medicine/Al-Mustansiriya University.

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#### Abstract

**Background:** Amblyopia or "lazy eye" this term means literally "dullness of vision" not complete blindness. It is a unilateral or bilateral decrease in form vision that is not fully attributable to organic ocular abnormalities, it is caused by form vision deprivation, abnormal binocular interaction or both during visual immaturity.

**Methods:** This cross-sectional screening was carried out in 13 primary schools in Al-karkh district in Baghdad city. Those with visual acuity of 6/12 and worse or a difference of two lines and more between the two eyes on the chart which was not corrected with the pin hole were referred to the ophthalmologist for final diagnosis.

**Results:** The predictive value of a positive test was 70.79%, and the overall prevalence of amblyopia was 1.27%. Strabismic amblyopia was the largest type of amblyopia at a rate of 34.92%. Unilateral amblyopia forming 98.4% of the total amblyopic children. Positive family history of amblyopia among families of cases was significantly differ from that of the control group (p-value 0.05).

**Conclusion:** The periodical visual examination as early as possible by an expert team to detect amblyopic cases, and identify underlining visual problems in order to start an appropriate treatment that may prevent the serious consequences.

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#### Introduction:-

Amblyopia is the commonest visual defect of childhood and early identification is vital for treatment to be successful<sup>(1)</sup>.

It is both a handicap and a danger, as incapacitating visual loss will ensure, or even blindness, if the vision in the non-amblyopic eye is lost. The handicap may take different form, including restriction on the choice of the jobs where binocular function is required or where there is some risk of ocular injury<sup>(2)</sup>.

Amblyopia is avoidable and to a degree treatable and deserves the best attention of the ophthalmologist<sup>(3)</sup>. The critical problem is early detection, as the later the diagnosis, the more difficult and less successful the therapy. This is the reason for most preschool and school vision screening programs and continues to be a major priority of the national society to prevent blindness<sup>(4)</sup>.

**Corresponding Author:- Haifaa Rashid Hamid**

Address:- MB.ChB. MSc. CM. (Corresponding author) Al-Ealam Medical Sector/ Al-Bayaa Primary Health Care Center.

### Subjects And Methods:-

The screening study was carried out in 13 primary schools in Al-Karkh district in Baghdad, for the period from the 15<sup>th</sup> of October 1994 to 30th of February 1995, 4943 pupils were examined (2353 males, 2590 females), following an approval of the ministry of education and ministry of health and after training period in Ibn Al-Haytham hospital and Al-Yarmouk teaching hospital-ophthalmological department for about 3months.

### Sampling:

We collected our sample from three different geographical areas including; Al-Bayaa, Hay Al-Maarifa and Al-Mansur quarters. We decided to do our study in these different quarters because they are near Al-Yarmouk teaching hospital in which there is an ophthalmological center, and to include a big sample with different geographical areas to be as much representative as possible. In each school, 50% of student from first to sixth grades were numbered and chosen by systematic random sampling.

### Screening tests:

The visual acuity (VA) was determined by the Snellen's E-test type which is a well-known and preferable test for screening school children used by many authors, the test was applied to the selected sample of students and the following criteria were regarded to designating an eye as amblyopic:

1. The visual acuity is either equal to 6/12 and worse <sup>(5)(6)(7)</sup>, or a difference of two lines or more on a visual acuity chart between the two eyes or both <sup>(3)(6)(8)(9)</sup>.
2. The persistence of visual acuity defect after correction of the refractive error and removal of any pathological obstacle to vision <sup>(10)</sup>.
3. Such amblyopic eye has a normal ophthalmoscopic examination <sup>(11)(12)</sup>.

The criteria for anisometropia was taken as a difference of one diopter or more in refractive error between the two eyes <sup>(9)(13)(14)(15)</sup>.

### Clinical examination:

The preliminary examination which was performed at school, which consisted of:

Measurement of the visual acuity of each eye: this measurement done by using Linear-Snellen-E chart, Pin hole (1mm) visual acuity test, and the Sheridan Gardiner test (as a single optotypes to identify the crowding phenomenon). All were performed at six meters distance.

External examination of the eye and face: Those in whom the visual acuity was found to be 6/12 or worse, or a difference of two lines or more on the chart between the two eyes, or both of them which was not corrected by pin hole in at least on eye were referred to Al-Yarmouk teaching hospital (ophthalmic clinic), where further examination was performed under supervision of a senior of ophthalmology (supervisor), including: Measurement of visual acuity with the subjective refraction (glasses); Assessment of the associated conditions like:

Strabismus by: The corneal reflection test; The cover-uncover test; And eye movement with pen or torch light. Assessment of refraction by retinoscopy, which was performed by the same refractionist (the same who performed subjective refraction) under cycloplegic drug in the form of 1% atropine drop after giving a paper to the parents of children to explain how to instill the drops in both eyes (1 drop, 3 times daily for 3 days prior to the examination), was performed at one meter distance (one diopter was subtracted from the strength of lens which neutralizes the movements of the retinoscope streak). slit lamp and ophthalmoscopic examination were also done. Patients in whom the defective vision proved to be due to an organic eye disease were excluded from the survey.

### The questionnaire:

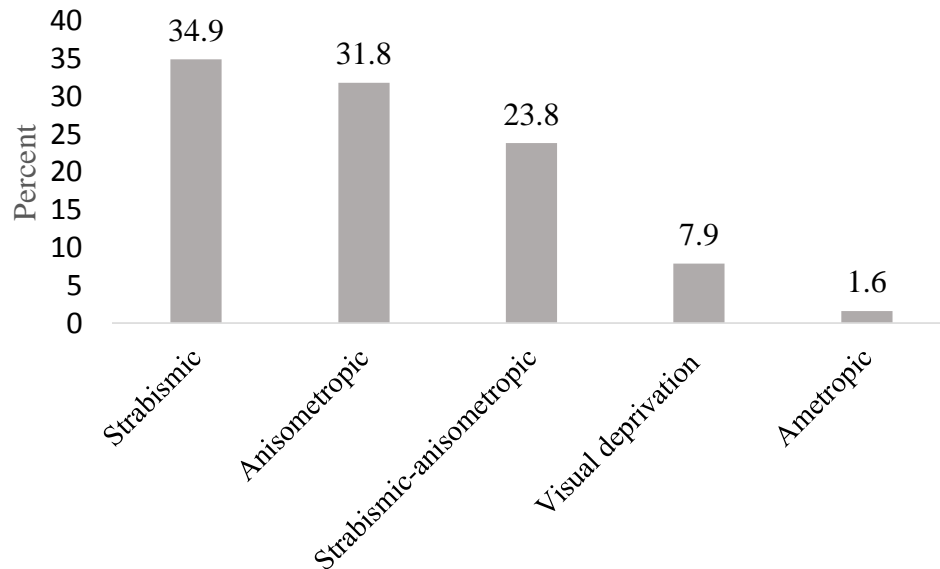
A pre-structured questionnaire was prepared and information for both cases and controls were obtained directly from parents

### Statistical analysis:

The statistical analysis was performed by hand using a scientific calculation. The prevalence of amblyopia was calculated. The predictive accuracy (positive) was calculated.

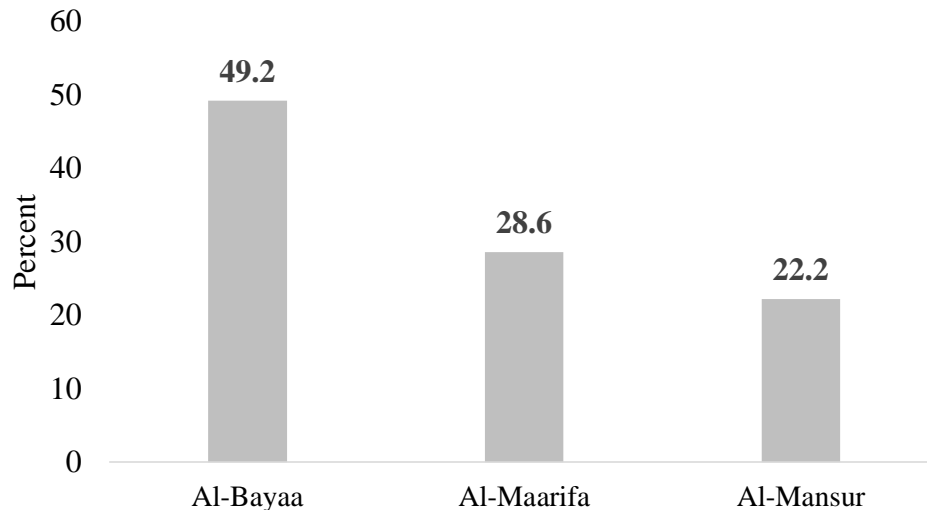
### Results:-

The predictive value of a positive test was 70.79 %. The overall prevalence of amblyopia was 1.27%. A rate of 34.92% from the amblyopic children were strabismic, 31.75% were anisometropic, 23.8% were strabismic anisometropic, 7.93% were amblyopia secondary to visual deprivations, and 1.6% was bilateral ametropic amblyopia as shown in Fig-1.



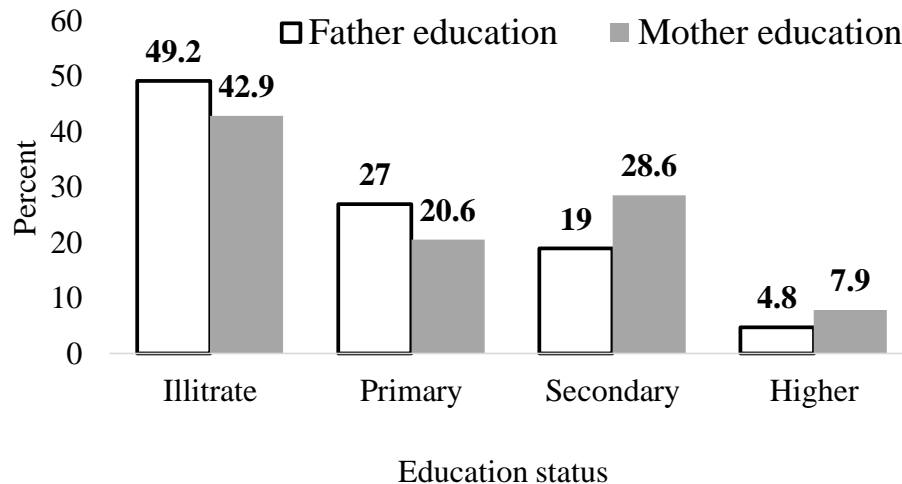
**Fig-1:-** Rate of different types of amblyopia.

Unilateral amblyopia forming 98.4% of the total amblyopic children and only 1.6% was bilateral ametropic amblyopia. The prevalence of amblyopia was different in the three different residential areas, such a difference was statistically significant ( $p < 0.05$ ) as shown in Fig-2.



**Fig-2:-** Distribution of amblyopic patients according to residency.

**Fig. 3:-** showed the education status of the patients' parents. Most amblyopic children had their mother's illiterate (42.9%). and high proportion of amblyopic children had their father illiterate 49.2%.



**Fig-3:-** Education status of parents.

Positive family history of amblyopia among the families of cases was significantly differ from that of the control group (p-value 0.05), 61.9% of amblyopic cases had a positive family history of squint which was statistically significant when compared with the control group ( $p < 0.001$ ), and 71.43% of the amblyopic cases had a positive family history of refractive errors which was found statistically significant when compared with the control group ( $p < 0.001$ ).

**Table-1:-** Distribution of cases and control group according to different family history variables.

Positive family history of	Case n(%)	Control n(%)	Total n(%)	P-value
amblyopia	1(1.6)	2(0.83)	3	0.05
squint	39(61.9)	19(7.9)	58	0.001
refractive errors	45(71.4)	40(16.8)	85	0.001

### Discussion: -

Amblyopia is a common condition with serious social effects. It is a source of considerable social and economic disability which could have been prevented in most cases if the visual examination and appropriate therapeutic measures had been adopted at an early age <sup>(11)</sup>.

In this study, the prevalence of amblyopia among primary school children screened was found to be 1.27% which is similar to the findings reported from many parts of the world for visual acuity of 6/12 or worse.

The differences in the prevalence rate of amblyopia in various countries is due to the adoption of different definitions or criteria of what is regarded as amblyopia, the sample screened, as well as the different screening methods used for diagnosis which are not usually standardized.

Of the 63 amblyopic children, 34.92% were found to have strabismic amblyopia, 31.75% had anisometropic amblyopia, 23.8% had strabismic anisometropic amblyopia, 7.93% had amblyopia secondary to visual deprivation and 1.6% had ametropic amblyopia. This shows that strabismic amblyopia was the most common type of amblyopia followed in order by anisometropic amblyopia, and bilateral ametropic amblyopia is the rare type.

This finding was in accordance with many other studies <sup>(9)(16)(17)(18)</sup>. On the other hand, the prevalence of amblyopia in this study was slightly higher in male (1.4 %) than females (1.16%) this difference however was statistically not significant. Such finding was similar to those which was reported by others like <sup>(6)(19)</sup>.

In the current study, the parent's education level demonstrated a significant relation with the occurrence of amblyopia, the lower the parent's education the higher the occurrence. This is also shown in previous studies <sup>(20)(21)</sup>.

This might be related to that; high parents' education increases their awareness about this problem and it's serious social and economic consequences and disability which can be prevented by periodic visual examination and appropriate therapeutic measures at an early age.

The difference of the prevalence of amblyopia among the three different residential areas including; Al-Bayaa quarter (1.97%), Hay Al-Maarifa quarter (1.06%), and Al-Mansur quarter (0.83%) was statistically significant. This can be explained by the difference in the social status, and as education is the best criterion for the determination of the social status of the families specially in our community. This significant difference can be explained on this basis. This confirmed the finding of other researchers like <sup>(6)(20)(21)</sup>.

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