Hitchings RA. Scaling the hill of vision: the physiological relationship between light se - sitivity and ganglion cell numbers. Invest. Ophthalmol. Vis. SCI. 2000; 41:1774-1782. (a).

6- Artes PH، Henson DB، Harper R، McLeod D. Multisampling suprathreshold peri - etry: a comparison with conventional s - prathreshold and full-threshold strategies by computer simulation. Invest Ophthalmol Vis Sci. 2003; 44:2582-7.

7- Mirabella، M. (2006). Hypothesis testing with SPSS. A non-statistictan's guide and t - torial. SPSS 14.1

8- Gardiner SK، Crabb DP. Frequency of testing for detecting visual field progression. Br J Ophthalmol.2002; 86:560-564. (a).

9- Williams PT. Relationship of incident glaucoma versus physical activity and fi - ness in male runners.Medicine & Science in Sports & Exercise. 2009; doi: 10.1249/ MSS.0b013e31819e420f.

10- Asaoka R. The relationship between v - sual acuity and central visual field sensiti - ity in advanced glaucoma. Br J Ophthalmol. 2013; 97:1355–1356.

11- Asrani S، Zeimer R، Wilensky J، Gieser D، Vitale S، Lindenmuth K. Large diurnal flu - tuations in intraocular pressure are an ind - pendent risk factor in patients with glauc - ma. J Glaucoma. 2000; 9(2):134-42.

12- Black. A. A. (2010). Functional st - tus، postural stability and falls among older adults with glaucoma. Queensland Unive - sity of Technology QUT.

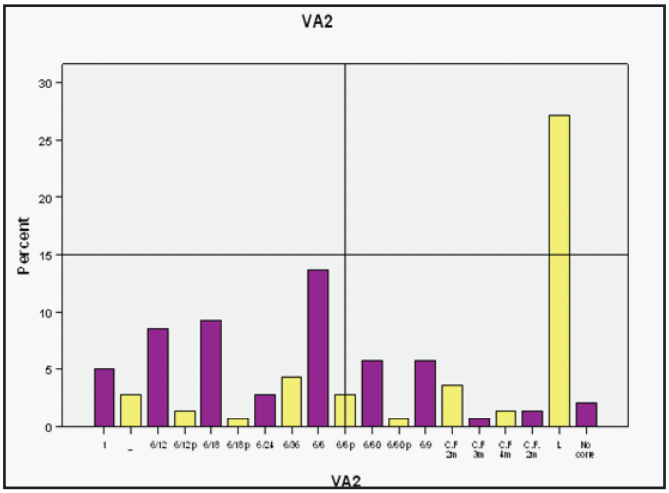


Figure (10): Visual acuity (VA) values for the patients without correction by spectacles for the left eye

Where:
P: Partial, the patient can see some letters in the line.
C.F: Count Finger, the patient can recognize the counting of fingers at that distance.

4- Conclusions

1. Criteria based on the GHT, GHT hemifield clusters, and the pattern deviation probability plot provides high sensitivity and specificity for detecting early glaucomatous visual field changes.
2. to evaluate the defects in glaucoma central 30-2 is better to use and to get zooms into the macular area, central 10-2 is good to use and to follow-up glaucoma 24-2 is good.
3. The zones which were damaged, causing of Glaucoma not is better in the age progressive.
4. High eye pressure is significant as a risk factor for glaucoma.
5. The early diagnosis is useful to manage Glaucoma. There is a clear relationship between glaucoma and the problems of the visual acuity of the patient's eye. Low vision like count finger leads to glaucoma in the future.

5- References

1- He M, Foster PJ, Ge J, et al. Prevalence and clinical characteristics of glaucoma in adult Chinese: a population-based study in Liwan District, Guangzhou. Invest Ophthalmol Vis Sci 2006; 47:2782– 8.

2- Kiuchi T, Motoyama Y, Oshika T: Relationship of progression of visual field damage to postural changes in intraocular pressure in patients with normal-tension glaucoma. Ophthalmology 2006. Dec; 113 (12):2150-5.

3- Heijl A, Lindgren G, Olsson, J: Test retest variability in glaucomatous visual fields. Am J Ophthalmol 1989;108:130-135.

4- Henson DB, Chaundry S, Artes PH, Faragher EB, Ansons A. Response variability in the visual field: comparison of optic neuritis, glaucoma, ocular hypertension, and normal eyes. Invest Ophthalmol Vis Sci. 2000;41:417-421.

5- Garway-Heath DF, Caprioli J, Fitzke FW,

Table (3): One sample T test

95% Confidence Interval of the Difference		Mean Difference	P-Value	V	t
Upper	Lower				
23.12	20.35	21.734	$p < .001$	63	31.378
23.30	20.79	22.045	$p < .001$	66	35.034

As shown in table (3). The P values are less than 0.05 and the 95% confidence intervals do not contain 0. The sample mean difference is much larger than can be explained by ra - dom variability about a population mean di - ference of 0 10 .

The frequencies of the selected cases as shown in the following figures (7 & 8). The intraocular pressure is an important factor in the progression of glaucoma. this is agreed with previous studies suck as Lindenmuth K. et al study at 2000 11

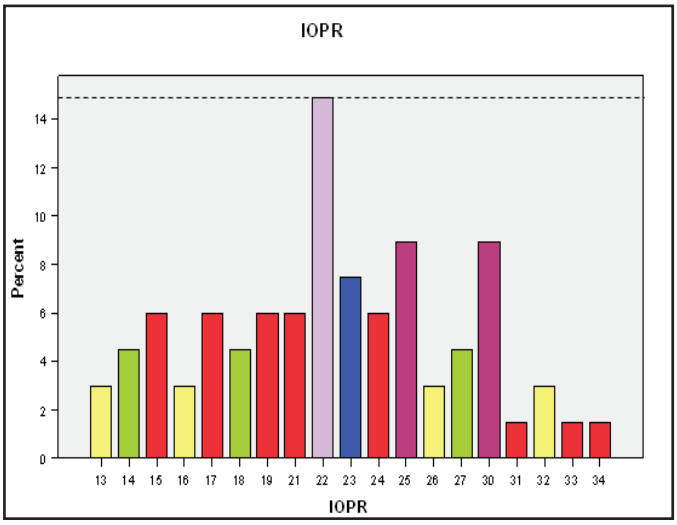


Figure (7): Intraocular lens power (IOP) results from the right eye

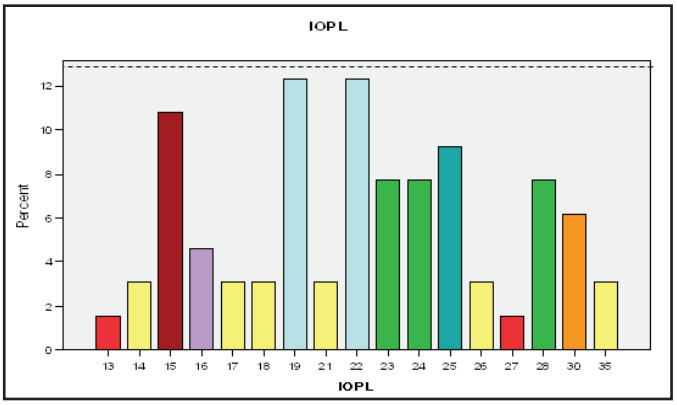


Figure (8): Intraocular lens power (IOP) results from the left eye

Glaucoma is one of the leading causes of irreversible vision loss among older adults. Visual acuity (VA) for the patients also e - amined for the right and left eye respectively as in the following figures. The visual acuity in both eyes was between normal (6/6) and blindness. This result agrees with the prev - ous study Black. (2010) 12 .

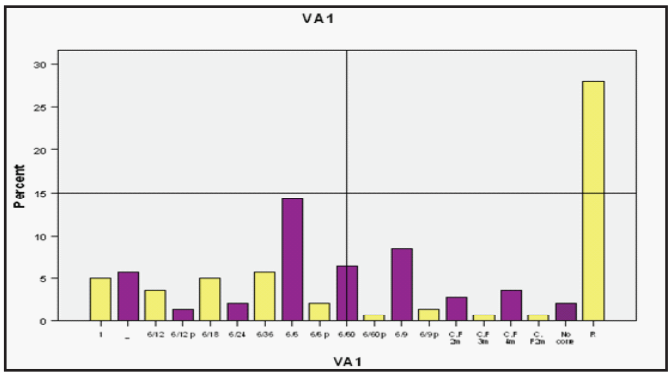


Figure (9): Visual acuity (VA) values for the patients without correction by spectacles for the right eye

3-Results & Discussion

The HVF 24-2 and 30-2 test 3 degrees from the horizontal and vertical meridian، and then every 6 degrees after that. A HVF 10-2 test 1 degree from the horizontal and vertical m - ridian، then every 2 degrees after that. The l - sions could be completely missed by the 24-2 and 30-2، even though the central 10 degrees is being tested.

10-2 would not be appropriate since need to evaluate farther out than 10 degrees. The di - ference between a 24-2 and a 30-2 is the extra row of points around the edge in the 30-2. Physicians vary in their preference between these 2 tests. A 30-2 gives more information with an extra row of points compared to a 24-2. It therefore tests more of the perip - eral vision and may detect the edge of a v - sual field defect that might be missed by the 24-2. The most peripheral points in the 24-2 would be in the most peripheral points in a 30-2 and would therefore be more believable. On the other hand، a 24-2 is quicker. Longer tests can cause patient fatigue and unreliable results. Previous studies have shown that a 24-2 can be as reliable a test as a 30-2 in gla - coma patients. Some physicians prefer to start with a 30-2، and if this is normal، co - tinue with a 24-2 for follow-ups 8 .

Eye pressure is measured in millimeters of mercury (mm Hg). Normal eye pressure ranges (12-22) mm Hg، and eye pressure of greater than 22 mm Hg is considered higher than normal. When the IOP is higher than normal، but the person does not show signs of glaucoma، this is referred to as ocular h - pertension 9 .

High eye pressure alone does not cause glaucoma. However، it is a significant risk factor. Individuals diagnosed with high eye pressure should have regular comprehensive eye examinations by an eye care professional to check for signs of the onset of glaucoma 9 .

The statistical analysis was studied using SPSS program as in the following figures and tables. One sample t-test used here to exa - ine the mean difference between the sample and the known value of the population mean.

Cases	N	Mean (mm Hg)	Std. Error Mean	S.
IOPR	64	21.73	.693	5.541
IOPL	67	22.04	.629	5.151

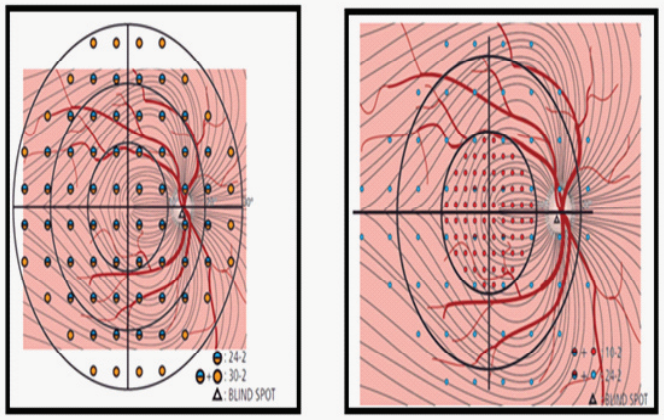
Table (2): One sample statistics show di - persion measurement values for the patients IOP for both eyes

Where:

IOPR: Intraocular Lens Power of the right eye.

IOPL: Intraocular Lens Power of the left eye.

to the testing protocol. Two main testing protocols were used here، 1 and 2. Protocol 1 tested points directly on the horizontal and vertical axis. Protocol 2 test points on either side of the horizontal and vertical axis. Since defects found right on the line can be di - cult to interpret، everyone uses 2.



(a) (b)

Figure (5): (a) Perimetry programs 24-2 and 30-2 and (b) Perimetry programs 24-2 and 10-2.

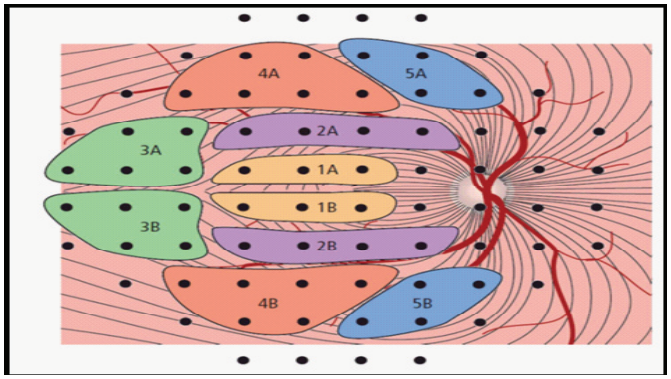


Figure (6): Clustering method for Gla - coma Hemifield Test (GHT)

One sample t-test is a statistical procedure used to examine the mean difference b - tween the sample and the known value of the population mean will know. This analysis was used to take a sample from the glaucoma patients. The hypothesis set up as in the fo - lowing 7 :

A. Null hypothesis: assumes that there are no significant differences between the pop - lation mean and the sample mean.

B. Alternative hypothesis: assumes that there is a significant difference between the population mean and the sample mean.

1. The standard deviation for the sample calculated by using this formula:

Where،
S = Standard deviation
n = number of observations in sample

2. The value of the one sample t-test، by u - ing this formula:

Where،
t = one sample t-test value
= population mean

3. The degree of freedom calculated by using this formula:

V = n-1

Where،
V = Degree of freedom

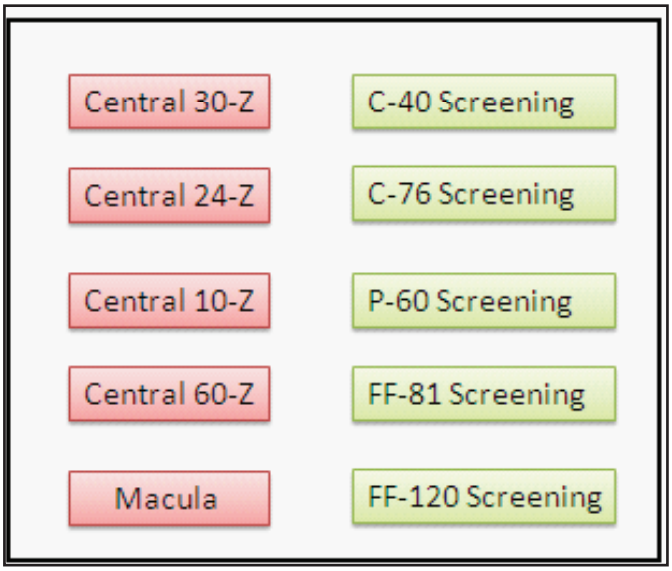


Figure (3): Visual field tests

In a 30-2 test, the (30) refers to the fact that the central-most 30° was tested. The use of a 10-2 test in a patient whose 30-2 test had a so much peripheral loss that nothing could be gained by testing outside the central area. For patients in whom the pathology is co - fined to the central few degrees, using a 10-2 program is wiser because the testing area is concentrated in the region of interest. For glaucoma patients, most practitioners use either a 30-2 or 24-2 program. The 24-2 program eliminates one row of peripheral points. If the patient has a more peripheral pathology, the examiner can use a 30/10-2 program to test the next 30°outside of the central 30°.

The tests were used in this work as follows (Central 30-2 threshold test as standard best to evaluate the defects in glaucoma and central 10-2 threshold test Zooms into the macular area and follow-up of chloroquine treatment and evaluation of maculopathies with a visual acuity better than 0.2, and 24-2 follow-up of glaucoma. The interpolation region for each of the examined eye was d - vided into different regions as in the follo - ing figure (4).

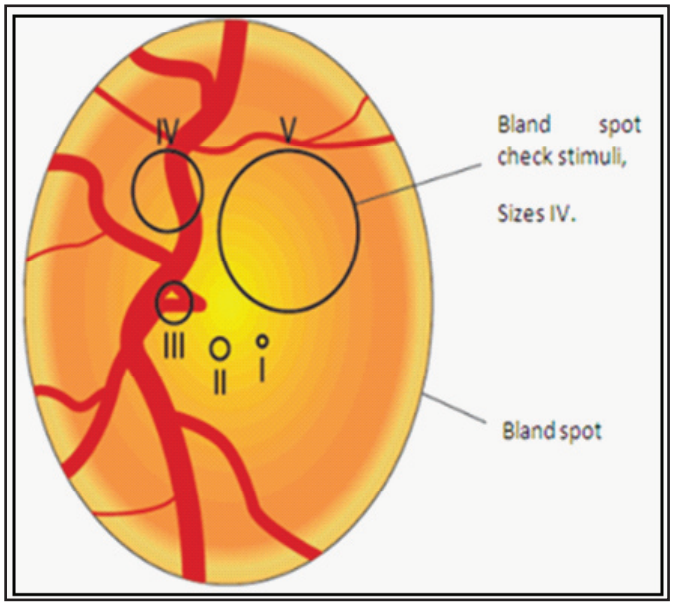


Figure (4): Interpolation regions of the examined eye

The comparison between primary programs 24-2.30-2 and Primary programs 24-2, 10-2 as in the following figure (5), A 10-2 means that the machine tests points 10° around the center vision (fovea). A 24-2 tests points 24° around the fovea. The second number refers

sual acuity (VA) with glaucoma. The ages of the selected cases were taken randomly (12 – 78) years old and the mean for these ages a - proximately 48 years old as shown in figure (1) and table (1) respectively.

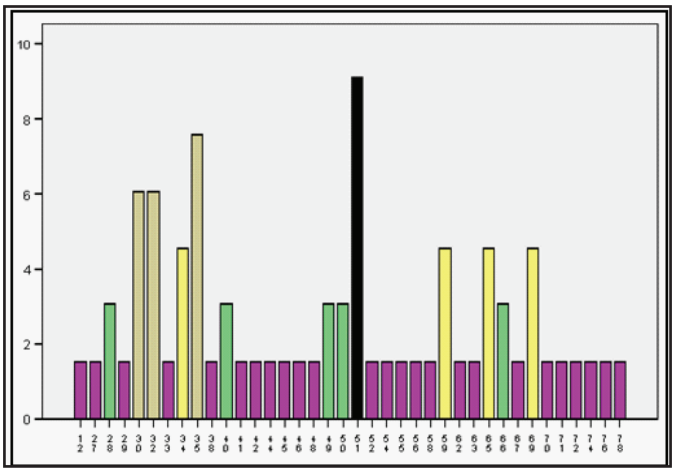


Figure (1): The frequencies for the patient's ages

Table (1): Dispersion measurement values for the patients

Dispersion	Values
Mean	48.32
SD.	15.43
Min.	12
Max.	78

The cases were selected randomly and examined using HFA. There were (29) female and (37) male as shown in the following figure (2).

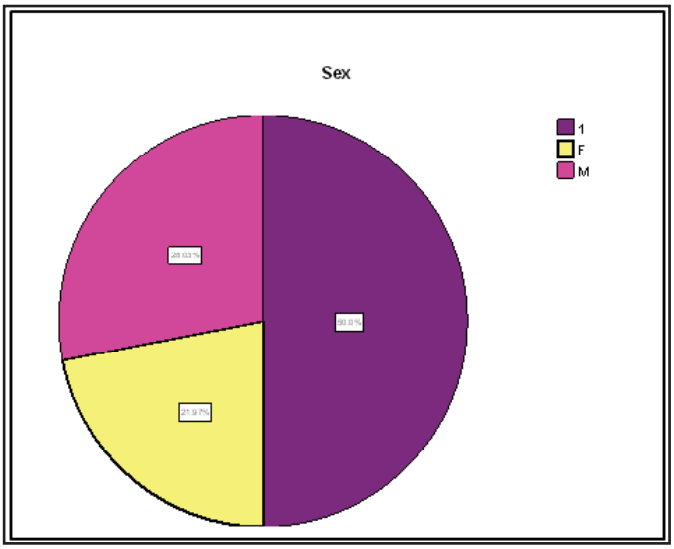


Figure (2): The frequencies of the patients according to gender

The thickness was determined by a predete - mined number of points, and then these data were used to construct a map of the interp - lating between the points tested. In the "24-2, 30-2, and 10-2" test on the (HFA), 76 points are tested over the patient's central 30° of v - sion. Then a threshold of light sensitivity was determined for each of these points.

This intensity of the stimulus, sees 50% of the time, and it can be likened to the depth or the thickness of each of these points. A map is then constructed to graphically represent the sensitivity of the patient's field of vision interpolating between these 76 points.

ويمكن مقارنة المجال البصري مع خريطة طبوغرافية على فرض أن المجال البصري يشبه الخريطة الطبوغرافية يجعل تفسيرها أسهل. رؤية المريض هو الأكثر حساسية في النقرة وتنخفض الحساسية تجاه المحيط. البقعة العمياء هي عيب المجال البصري المطلق الناجمة عن رأس العصب البصري الذي لا يوجد لديه الشبكية الفوقية.

ستون حالة مرضية فحصت بمستشفى غازي الحريري بأستخدام جهاز جديد للساحة البصرية وتمت المقارنة بين البرامج (24-2)، (30-2)، (10-2).

بعد التشخيص مباشرة أستخدم مبدأ المناطق الأمنة والغير امنة لتحديد ضعف البصر ودراسة الأعمار وأقل ضرر وأعلى ضرر وأقل وقت لأحراز التقدم. المناطق المصابة بداء الزرقاء لاتتحسن مع التقدم بالعمر.

بينت الدراسات وجود علاقة واضحة بين الحدة البصرية وداء الزرقاء و ضغط العين.

1- Introduction

Glaucomatous damage to the optic nerve head causes a loss of visual function. Central visual acuity is relatively resistant to gla - comatous damage; therefore decreases in v - sual acuity occur very late in glaucoma 1 . Perimeter، which is applied to measure the patient's visual field، is useful both for diagnosing glaucoma and for pursuing the patient to determine whether glaucoma is progressing 2 .

Many techniques are available for measuring the visual field، ranging from confrontation to highly automated static threshold peri - etry to be useful for glaucoma management، a parametric technique needs to be not only sensitive، but also reproducible 3 . The techniques of confrontational fields، tangent screen testing، and arc perimeter are not su - ficiently reproducible to make them useful for following the progress of patients with glaucomatous damage 4 .

Stimulus intensity is measured in decibels (dB) of attenuation of the stimulating light. Each stimulus can be presented at varying brightness، from 0.08 to 10،000 apostles l - minance; the lowest brightness which can be seen at the point is known as the sensitivity threshold of that point، reported on a decibel (dB) scale which is based on the log lum - nance. If the stimulus intensity is measured in Lamberts (where one Lambert = 10،000 apostles)، then 1dB = 10 × logs (1/L). 5 and 6 .

2- Materials & Methods

Sixty cases were examined in Ghazy Al-Hariri hospital for the period from November 2014 until March 2015 using a new visual field d - vice (HFA). Three Primary programs used here، these are (30-2، 24-2 and 10-2). Seventy six points are tested over the patient's ce - tral 30° of vision. Then a threshold of light sensitivity was determined for each of these points. The statistical study was also done for the selected data to study the prevalence of glaucoma، according to sex and ages and to study the relationship between glaucoma، the intraocular lens power (IOP) and the v -

Diagnosis of glaucoma using the New Matrix Humphrey Field Analyzer (HFA) Perimetry programs

Fadia W. Al-Azawi
Dijlah University College and
Zaid F. Makki
Dijlah University College and
Osama Q. Abdullah
Al-Nahrain Center for strategic studie
Fadia.alazawi@duc.edu.iq

Abstract
Glaucoma is a disease where the optic nerve dies. There is no sure reason for this happens (there are many mechanical، vascular، and biochemical theories) but high intraocular pressure certainly seems to be associated، if not entirely the cause of optic nerve death.
The visual field can be compared with a top - graphic map. Considering the visual field to be like a topographic map makes interpret - tion easier. The patient's vision is most se - sitive at the fovea، and sensitivity decreases towards the periphery. The blind spot is an absolute visual field defect caused by the optic nerve head، which has no overlying retina.
Sixty cases were examined in Ghazy Al-Hariri hospital for the period from Nove - ber 2014 until March 2015 using a new visual field device. Comparison between primary programs 24-2، 30-2 and 10-2 was done.
Immediately after diagnosis، use the concept of Safe and Unsafe Zones to determine risk of visual impairment and initial treatment. There are safe and unsafe zones in the di - gram، age and damage are crucial lower age – more time to progress higher age – less time to progress.
The results of this study show that there is a clear relationship between visual acuity، glaucoma، and the intraocular pressure.

الخلاصة :

داء الزرقاء هو مرض موت العصب البصري، ليس هناك سبب أكيد لحدوث هذا المرض ولكن هناك الكثير من الميكانيكية والاوعية الدموية والنظريات الكيميائية الحيوية ولكن أرتفاع ضغط العين هو سبب رئيسي وممكن يكون سبب وفاة العصب البصري.