

## Causes of visual impairment and blindness among the middle-aged and elderly in northern Jordan

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أسباب ضعف الرؤية والعمى بين المسنين ومتوسطي العمر في شمال الأردن

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**الخلاصة:** تم استقصاء أسباب ضعف الرؤية الثنائي الجانب والعمى الثنائي الجانب لدى 720 من المرضى الخارجيين الذين تزيد أعمارهم على 45 عاماً في إربد، الأردن، بين تموز/يوليو 1999 وتشرين الأول/أكتوبر 2000. وقد أجري لهم جميعاً فحص عيني كامل، وتم تعريف ضعف الرؤية الثنائي الجانب على أنه حدة الرؤية التي هي أقل من 6/18 ولكنها أكثر من 3/60 في العين الأكثر قوة، كما تم تعريف العمى الثنائي الجانب على أنه حدة الرؤية التي هي أقل من 3/60 في العين الأكثر قوة. وقد وجد أن السبب الرئيسي لضعف الرؤية الثنائي الجانب والعمى الثنائي الجانب هو الساد (الكتاراكت)، فيما كان السبب الثاني هو أخطاء الانكسار. ويأتي بعد ذلك الأسباب الشائعة الأخرى وهي اعتلال الشبكية السكري والزرق. ويكون تنكس اللطخة الصفراء المرتبط بكبر السن مسؤولاً بمفرده عن 1.6% من حالات العمى الثنائي الجانب وعن 2.8% من حالات ضعف الرؤية الثنائي الجانب. ويوصي الباحثون بالقيام بمسح مرتكز في جمهرة السكان للمسنين المصابين بالعمى الثنائي الجانب وضعف الرؤية الثنائي الجانب وبالقيام بفحوص الرؤية كل عام وتنفيذ برنامج تثقيفي حول صحة العين

**ABSTRACT** Causes of bilateral low vision (BLLV) and bilateral blindness (BLB) were investigated among 720 outpatients aged >45 years in Irbid, Jordan, between July 1999 and October 2000. All received full ophthalmic examinations. BLLV was defined as visual acuity < 6/18 but > 3/60 in the better eye; BLB as acuity < 3/60 in the better eye. The leading cause of BLB and BLLV was cataract. Refractive error was the second major cause of BLLV. Other common causes were diabetic retinopathy and glaucoma. Age-related macular degeneration was the single cause of BLB and BLLV for only 1.6% and 2.8% respectively. A population-based survey of BLB and BLLV in the elderly, yearly vision examinations and an ophthalmic education programme are recommended.

### **Causes de déficience visuelle et de cécité chez les personnes d'âge moyen et les personnes âgées en Jordanie septentrionale**

**RESUME** Les causes de malvoyance bilatérale et de cécité bilatérale ont été examinées chez 720 patients des consultations externes, âgés de moins de 45 ans, à Irbid (Jordanie) entre juillet 1999 et octobre 2000. Tous ont subi un examen ophtalmologique complet. La malvoyance bilatérale a été définie comme une acuité visuelle inférieure à 6/18 mais supérieure à 3/60 pour l'œil le meilleur ; la cécité bilatérale comme une acuité inférieure à 3/60 pour l'œil le meilleur. La cataracte était la cause principale de malvoyance et de cécité bilatérales. Les anomalies de la réfraction constituaient la deuxième cause principale de malvoyance bilatérale. La rétinopathie diabétique et le glaucome étaient d'autres causes courantes. La dégénérescence maculaire liée à l'âge était l'unique cause de malvoyance et de cécité bilatérales pour seulement 1,6 % et 2,8 % respectivement. Une enquête sur la malvoyance et la cécité bilatérales dans une population de personnes âgées, un examen annuel de la vue et un programme d'éducation oculaire sont recommandés.

### Introduction

Low vision is a major problem for society that will grow as individuals live longer and survive trauma, illness and other complications. In addition to visual impairment, elderly people are likely to suffer from an increasing number of other disabilities and frailties [ 1] including loss of employment, retirement, loss of hearing, loss of memory and reduced mobility [2]. After arthritis, chronic visual impairment is the most common complaint among the elderly [3].

The increasing awareness of low-vision problems is evident in the *International classification of diseases*, 10th revision, which has codes for both blindness and low vision [ 4]. In this classification, bilateral blindness (BLB) is defined as visual acuity of less than 3/60 (0.05) or corresponding visual field loss in the better eye with best possible correction (visual impairment categories 3,4 and 5 in ICD-10) (USA criteria for blindness is acuity less than 6/60). Low vision is defined as visual acuity of less than 6/18 (0.3) but equal to or better than 3/60 (0.05) in the better eye with the best possible correction (visual impairment categories 1 and 2 in ICD-10) (USA criteria for visual impairment is best acuity of less than 6/12 and better than 6/60) [5].

Many studies around the world, including in both developing and industrialized countries, have collected data on blindness and visual impairment in the elderly. In our study, we investigated the causes of irreversible blindness and low vision not associated with other morbidity in middle-aged and elderly patients in northern Jordan.

### Methods

Our data were collected among middle-aged and elderly patients (> 45 years of age) complaining of bilateral low vision (BLLV) who attended the ophthalmic clinic at Prince Rashed Bin Al-Hasan Hospital. This hospital is a military referral hospital that covers all of northern Jordan and serves approximately 1.3 million people. Military hospitals in general cover the health needs of 45% of the population in Jordan.

All patients received an ophthalmic examination that included a visual acuity examination using the Snellen E chart and a full eye examination to determine the main causes of visual impairment. In the case of visual acuity of less than 6/18, a pinhole visual acuity test was performed; if there was an improvement of at least one Snellen, line refraction was performed. The full eye examination included slit lamp examination, Goldman applanation tonometry, pupillary reaction to light, mydriatics and funduscopy by direct and indirect ophthalmoscopy and by 78 diopter lens and fluorescein angiogram. BLLV was defined as a visual acuity of less than 6/18 but greater than or equal to 3/60 in the better eye and BLB was

defined as visual acuity of less than 3/60 in the better eye. Visual field was not taken into account.

## Results

A total of 720 patients > 45 years with BLB or BLLV according to our criteria were selected between July 1999 and October 2000; 348 (48.3%) women and 372 (51.7%) men. Their ages were between 45 and 95 years with a mean of 62.6 years. Of the 720 patients, 532 (73.9%) had BLLV and 188 (26.1%) had BLB.

Table 1 Leading causes of BLLV and BLB in patients

Cause	BLLV		BLB	
	No.	%	No.	%
Cataract	208	39.1	113	60.1
Refractive error	91	17.1	3	1.6
Diabetic retinopathy	77	14.5	25	13.3
Glaucoma	60	11.3	16	8.5
Corneal opacity	25a	4.7	6	3.2
Age-related macular degeneration	15	2.8	3b	1.6
Other retinal and optic nerve disease	21	3.9	3	1.6
Others and multifactorial	35	6.6	19	10.1
Total	532	100	188	100
aMainly due to trachoma.				
bAs the only cause of blindness.				
BLLV = bilateral low vision.				
BLB = bilateral blindness.				

Cataract was the leading cause of both BLLV (39.1%) and BLB (60.1%). The second most common cause of BLLV was uncorrected refractive error (17.1%), followed by diabetic retinopathy (14.5%) and glaucoma (11.3%) (Table 1). Diabetic retinopathy (13.3%) and glaucoma (8.5%) were the other main causes of BLB (Table 1).

Table 2 Comparison of the leading causes of blindness in selected countries

Country	1st cause	2nd cause	3rd cause	4th cause	5th cause
Jordan	Cataract	Diabetic retinopathy	Glaucoma	Corneal opacity	Refractive error
Scotland	ARMD	Glaucoma	Cataract	Diabetic retinopathy	Myopia
England/Wales	ARMD	Cataract	Glaucoma	Myopia	Diabetic retinopathy
United States of America	Glaucoma	ARMD	Cataract	Optic nerve atrophy	Diabetic retinopathy
Canada	ARMD	Diabetic retinopathy	Glaucoma	Optic nerve atrophy	Cataract
Sweden	Tapetoretinal degeneration <sup>a</sup>	Diabetic retinopathy	Optic nerve atrophy	Uveitis	Myopia
India	Cataract	Glaucoma	Staphyloma	Optic nerve atrophy	Anophthalmos
aGenetic origin.					
Source: [15].					
ARMD = age-related macular degeneration.					

Age-related maculopathy caused BLLV in only 15 patients (2.8%), all of whom were aged 70 years or older. Three patients (1.6%) had age-related macular degeneration (ARMD) as a cause of BLB; all of these were over the age of 75 years.

## Discussion

Ocular disorders in the elderly have become more important because of increased longevity and demand for good vision [ 6]. Data on blindness and visual impairment in Jordan are limited compared with some other countries where large-scale studies have been conducted.

Cataract is the most prevalent eye disease in the world and is a major cause of visual loss in developing as well in industrialized countries [ 7]. Other major eye diseases in the elderly include ARMD, glaucoma and diabetic retinopathy [ 5–10]. In our study the major cause of BLLV and BLB was cataract, which is a treatable condition simply by cataract extraction and intraocular lens insertion. In Africa and Asia, cataract has been reported to be the main cause of blindness and low vision [ 11].

Uncorrected refractive error was the second most common cause of BLLV in our study group (91 of 532 patients, 17.1%). This too can easily be corrected with the provision of appropriate optical services.

Diabetic retinopathy was the second most common cause of BLB and the third most common cause of BLLV in our study group. Diabetic retinopathy is considered to be a preventable cause of blindness with early diagnosis [ 6] and laser treatment is remarkably effective for diabetic maculopathy.

Glaucoma is also a largely preventable cause of blindness. It accounted for 11.3% of our patients with BLLV and for 8.5% of our patients with BLB. In a study in the Republic of Ireland, glaucoma was the most common cause of blindness for the age group 65–79 years [12].

Surprisingly, ARMD accounted only for 2.8% of BLLV and 1.6% of BLB. This prevalence is much lower than most other studies from Europe and the United States. In a study done in the United States, Bressler et al. reported that the most common cause of severe vision loss in individuals over the age of 50 years was ARMD [13]. In Britain, Evan and Wormald reported that there was an epidemic of blinding ARMD and observed an increase in the order of 30%–40% in age-standardized registration due to ARMD in England and Wales over the past 40 years [14]. Furthermore, ARMD was the major cause of blindness in Scotland (Table 2) [15].

A similar study to ours was conducted at the King Hussein Medical Centre in Jordan by Tahat et al. who found that the leading three causes of blindness in Jordan, independent of age, were cataract (30%), advanced diabetic retinopathy (21%) and all forms of glaucoma [16].

A national survey should be conducted in Jordan for the proper and detailed study of causes of visual impairment for prevention of blindness and improvement of quality of life. The prevalence of blindness and low vision in our study due to ARMD is lower than most other studies conducted in other countries. In most of the patients in our study, both blindness and low vision were treatable (cataract or refractive error) or preventable (glaucoma or diabetic retinopathy). We therefore emphasize the need for establishing a national blindness prevention programme and for routine annual ophthalmic examinations for all patients over the age of 45 years for the early diagnosis and possible prevention of age-specific ocular diseases.

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