

Incidence of Ophthalmic Disease in the Dakhla Oasis in Egypt by a prevention of blindness major campaign

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ABSTRACT

Purpose: To Evaluate the incidence of ocular diseases in the Dakhla Oasis Egypt

Methods: Examination in 1 central hospital and 17 primary health care units and 10 small villages and cities in the western desert in Egypt. There were 15 ophthalmic volunteers divided into 3 screening groups and one operation team. The 3 group screen the village and give free medical treatments for the patients, the major operations referred to the central hospitals to be done by the operation team. Screenings include full eye exam, Intraocular pressure (IOP) measurement and visual acuity (VA) measurement, fundus examination and minor operations. Major operations, laser treatments and some investigations were done by the surgical team.

Results: the campaign examined 3780 patient and treatment was given, 81 Cataract operations, 14 Other Major operations and 29 minor operations were done. The diseases were 6.59% lid, 1.11% lacrimal system, 49.60% conjunctive, 6.30% corneal, 0.40% uvea, 5.58% glaucoma, 12.59% cataract, 4.92% fundus diseases and 1.11% Extraocular muscles (EOM) problems.

Conclusions: prevention of blindness programs are important for curing different ocular disease and prevent their progression .

KEYWORDS: ocular diseases; prevention of blindness; Egyptian Oasis; trachoma; Outreach programs

INTRODUCTION

The World Health Organization (WHO) estimates that 90% of the 285 million visually impaired people in the world live in low-income countries.¹ There are at least 45 million blind patients worldwide with visual acuity of 3/60 or less or (0.05= \leq 120/400). However the number of blind patients will increase tremendously if visual acuity of 6/60 in the patient's better eye is applied as a definition of blindness .²

Blindness is a crippling financially draining disease in developed countries and even more so in the developing countries not only due to untreatable ophthalmic diseases but also due to treatable ones.³ There are many causes of visual

impairment ranging from the untreated errors of refraction, complicated trachoma, cataract, diabetic retinopathy to other untreatable age-related macular degenerations and late-stage glaucoma. Almost half of the patients with optic nerve damage due to glaucoma are undiagnosed in developed world which reach up to 70%-100% in developing countries². Even symptomatic eye disease such as diabetic retinopathy and cataract are not early diagnosed in rural areas such as the Dakhla

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Oasis³.

Early surveillance and proper screening is mandatory to eliminate blindness . Professional ophthalmic care service has been provided to the Egyptian western desert population as early as 1960s as a mean of blindness prevention.⁴⁻¹⁶

The geographical nature of the western desert oasis is unique in Egypt as it lies outside the old valley. The hot dry weather of the desert affects the spread of certain infectious diseases. The exposure to ultraviolet rays certainly affects the eye in many ways. Working in the desert in the day light especially in agricultural areas definitely increases the UV exposure. There are several diseases that are directly correlated to exposure to UV as pterygium, cataract, and age related macular degeneration³.

Egypt has 5 Oasis. Siwa Oasis in Marsa Matrouh government, Baharia Oasis in 6 October Government, Farafra Oasis, Dakhla Oasis and Kharga Oasis in New Valley Government. The people distribution as follows; Baharia Oasis 26000, Farafra Oasis, Dakhla Oasis, and Kharga Oasis are 233000 person³.

Patients and Methods

This is a cross sectional study with a random convenient sample size of 3780 persons.

All subjects gave their informed written consent before entering the study, which was conducted in accordance with the Declaration of Helsinki and approved by the institutional ethical committee

Three ophthalmic teams were involved in screening and treatment of ophthalmic

problems in the new valley, Dakhla oasis. Each team is formed from a Professor or a consultant, an assistant lecturer, resident and house officers or students. The ophthalmic team screens the villages in the primary health care clinics or in schools or sometimes in village leader house when there are no schools or primary health care units. Also, another team did ophthalmic examinations in the village hospitals or city hospital. All large and small villages were screened and treated for ophthalmic problems.

In Dakhla City. There is one main hospital in the central oasis for referrals from the village outpatient clinics. This hospital is equipped with some ophthalmic equipment and we provided the necessary ophthalmic instruments, ophthalmic microscopes and other ophthalmic machines to facilitate surgery of most ophthalmic major operations.

In the large villages there is a primary health care unit. Patient examinations were done by one team.

Each team is equipped with ophthalmic pen light, direct and indirect ophthalmoscope, Schoitz tonometer, Tonopen, minor ophthalmic instruments, ophthalmic disposables and medications.

Full ophthalmic examination and some minor surgeries were done on site while other minors and major operations were referred to the central hospital to be done by the surgical team.

Each team need a consultant or a professor that is leading that team and in responsible for everyone. He is assisted by 1 or 2 specialists with an intern, nurse, and an administrative assistant. The consultant and the specialists

make the patient screening process in its core, the intern and the nurse are making the surrounding jobs like measuring the visual acuity, the administrative person helps organizing the patient in this proper turns and transmitting orders from the leader to his soldiers. Also, the administrative staff is responsible for the medical supplies like eye drops and other equipment and finally they arrange for the transportation of each team from one location to the other. This “Bee nest” attitude allows for quick achievement of work and covering as much villages as possible in a short time with all coming back at the end of the day to central point or “nest”.

The same build up goes for the surgical staff only with minimized need of transportation as major surgeries are done in the central hospital while the minor surgeries are under the responsibility of the “travelling medical teams”.

The surgeon has one assistant involved in surgery, one assistant arranging for patient preparation as pupillary dilatation when

needed, biometry, and local anesthesia in selected cases. Another part of the surgical teams stay in the hospital in the second day postoperative to make the patient dressing and report any complication.

The performance of the campaigns is done through a central command of the senior professor and his assistants.

The attitude was “go for” rather than “wait for” meaning that the screening groups were not staying in the central hospital waiting for patients to come but the screening teams go the health care units and turn them into eye clinics and sometimes they also go for some patients at their homes when there is a handicapped patient.

RESULTS

During the screening program in the Oasis 3780 patients were examined, 81 cataract operations, 14 other major operations and 29 minor operations were done as shown in table 1

Table 1: showing summary of ophthalmic screening and operations done in charity campaign

Patients screened		3780	
Cataract	Phacoemulsification	12	9.68%
	ECCE*	69	55.65%
Major operations	Trabeculectomy	4	3.23%
	Squint	6	4.84%
	TC-DCR**	4	3.23%
Minor operations	ptreguim	9	7.26%
	entropion	6	4.84%
	ectropion	4	3.23%
	chalazion	6	4.84%
	intubation	4	3.23%

*Extra Capsular Cataract Extraction

** trans canalicular dacryocystorhinostomy

Table 2: showing percentage comparison of ophthalmic screening results of different eye diseases

Disease	no	percent	Disease	no	percent	Disease	no	percent
lid	249	6.59%	conjunctiva	1875	49.60%	cataract	476	12.59%
trichiasis	50	1.32%	trachoma	984	26.0%	immature	349	9.2%
entropion	35	0.93%	Mucopurulent conjunctivitis	297	7.9%	Mature	59	1.6%
ectropion	15	0.40%	allergic conjunctivitis	398	10.5%	complicated cataract	23	0.6%
ptosis	20	0.53%	pterygium	168	4.4%	congenital cataract	18	0.5%
rubbing lashes	120	3.17%	ophthalmia neonatorum	5	0.1%	traumatic Cataract	8	0.2%
chalazion	9	0.24%	symbblepharon	23	0.6%	Ectopia lentis	19	0.5%
lacrimal	42	1.11%	uvea	15	0.40%	others	189	5.00%
dacryocystitis	5	0.001	Ant Uveitis	13	0.3%	exophthalmos	15	0.4%
Naso Lacrimal duct obstruction	37	0.01	intermediate Uveitis	0	0.0%	atrophia bulbi	45	1.2%
			Posterior Uveitis	2	0.1%	amblyopia	129	3.4%
cornea	238	6.30%	glaucoma	211	5.58%	fundus	186	4.92%
keratoconus	54	1.4%	POAG	124	3.3%	retinitis pigmentosa	21	0.6%
leucoma adherent	28	0.7%	Closed Angle	38	1.0%	cone dystrophy	1	0.0%
leucoma non adherent	48	1.3%	Secondary Gl	21	0.6%	optic atrophy	3	0.1%
dystrophy	45	1.2%	Congenital Glaucoma	28	0.7%	Age related macular Degeneration	68	1.8%
Degenerations	49	1.3%	EOM	42	1.10%	Non - Proliferative Diabetic Retinopathy	72	1.9%
Keratitis	3	0.1%	Esotropia	24	0.6%			
Ulcer	11	0.3%	Exotropia	14	0.4%	Proliferative Diabetic Retinopathy	21	0.6%
			Hypertropia	3	0.1%			
			Dissociated Vertical Deviation	1	0.0%			

The ophthalmic disease were distributed according to the table 2 were we can find that majority of eye problems were concentrated in the conjunctival disease 49.6% which was mainly trachomatous problems in about 72.1% , mucopurulent conjunctivitis (MPC) in about 13.4%, allergic conjunctivitis in 7.5%, pterygium in 5.9% and other conjunctival problems were 1.1%.

The surgical team performed the surgeries in the central hospital. The surgeries performed are mainly cataract surgeries 81 most of them were done Extra Capsular cataract Extraction (ECCE) technique due to high maturity and the nuclear sclerosis of the patients from sun exposure. The retinal problems were referred to Cairo for surgeries as they need highly equipped hospitals.

The minor operations (chalazion, electrolysis, post-trachomatous degenerations (PTD's)) were done in the villages by the screening team. The pterygium, lacrimal intubation, lid surgeries and the limbal mass were done by the surgical team in the central hospital we found that the trachomatous complications 81% were the majority of the problems solved by minor surgeries

DISCUSSION

Egypt is a country with large variation in the geographical distribution of population from large population cities like Cairo and Alexandria to smaller cities to villages. The Egyptian Oasis in the New Valley Governorate represents a unique state of population distribution in Egypt and may be worldwide. The construction of each Oasis is based on a central small city which is the capital and surrounded by a number of villages that under control of the city authorities.

From the health care point of view the city has a large central hospital which is well equipped while villages have health care center that supports only general practice and family medicine and that send cases to the central hospital when needed. Oases are widely separated from each other and from the nearby governorates. The demographic criteria include nearly all grades of civil and rural population

Although the system is working with acceptable performance, however, there are increased needs to support the system as the major shortcoming of the whole system is the lack of highly qualified professionals. University professors are the summit of the medical and education system in Egypt. The Oasis health care system depends on sending cases that needs high quality experience to large central hospital in the Ministry of Health or In the Egyptian university hospitals.

In revision of the various reports of the WHO about blindness worldwide¹⁷ and other studies in Egypt³⁻²¹, it is clear that The Egyptian Oasis is not far from the estimated rate of blindness as well as the prevalence of eye disease as shown in our results.

Conjunctival diseases, mainly trachoma, which is endemic in Egypt^{3,21}, represented the highest percent (26%) of disease presentation that brings the patient to be examined by the screening ophthalmologists, however, the majority were only conjunctival disease that showed no corneal complications, corneal problems constituted only the minority of trachomatous infection reflecting success of the various programs to control the disease in Egyptian Oasis.

These results are also close to the screening survey by Saif et al in 2012³ showing that

conjunctival diseases also represented the highest percentage of 45.6% where trachoma remains the main type of conjunctivitis followed by MPC, allergic while the least was pterygium.

These results are comparable to a study done in the Nile delta by Courtright et al^{10,11} and by Rashwan et al¹² in Sohag also showing trachoma as the most common conjunctival disease among the Nile Delta population with its complication as the main cause of blindness. Unlike in our study where minimal trachomatous complications were noticed

This also goes for the different causes of blindness with cataract as the major cause of blindness followed by glaucoma, with the corneal problems ranking third after those two entities.

The low incidence of fundus problems, we think is not true and the cause of this low false incidence is lack of orientation about those diseases and the delayed presentation of patients suffering from diseases when he or she “feels” that there is a problem in vision. For sorrow, this usually happens when one eye is severely affected and the functioning eyes becomes short of helping the patient in his daily activity.

Mousa et al^{14,15} in prevalence of visual impairment & blindness in Upper Egypt a gender based perspective declared that cataract 60 % showed the highest cause of blindness but in our study it was only 12.59% and the second cause was trachomatous trichiasis which was 9.7 & while in our study was only 1.32%. Corneal opacities in our study was 4.5% which is lower than their study. This may

be due to the regular screening and treatment of the Egyptian Western oases population on a regular half yearly basis ever since the 1960s.

The second most common known cause of blindness worldwide is glaucoma which was 5.58% in our study while in a study performed by El-Daly et al¹⁶ showed a larger percentage with a prevalence of 8.1%.^{17,18}

The surgical procedures did not show any increased rate of complications from what is recorded in the literature. No cases of endophthalmitis or other postoperative infections were recorded in this study. Only reversible striated keratopathy was recorded in about 15% of cases and did not affect the visual outcome. Two cases of mature cataract failed to show expected improvement after surgery due to advanced age-related macular degeneration in one case and traumatic macular scarring in the other case. Only one case of glaucoma surgery had postoperative shallow anterior chamber with hypotony and this was due to choroidal effusion that responded to steroid therapy. The low complication rate reflects the strict control of surgical environment of the proper postoperative care. Making large number of surgeries over a short period of time can be done without added complication due the short time interval by organizing the work strictly and by creating teams with predefined responsibilities for each team members.

The surgical teams were alternating over the same surgical table due to the number of tables is less than the number of surgical team, and this was the usual situation. While one team is operating on the set number of cases the other goes to take rest and so on. This approach

made the operating table serve over the 24 hours with optimum performance.

The screening study was also a way of training residents and interns about working with such large number of populations.¹⁹⁻²¹ Working as an assistant in the medical and surgical divisions of the campaign provided a great experience of learning for younger generation. They examined most of the varieties of ophthalmic diseases having the chance to acquire knowledge from the attending professor or consultant. Surgical assistance is definitely one of the best methods and the most important step in qualifying a surgeon, something that was very much available for younger ophthalmologist in the campaigns.

The local ophthalmologists, nurses, and other paramedical jobs were provided by a great opportunity to recognize a different level of experience and knowledge and to upgrade their skill by contacting a higher level of skillful personals. In one instance, a newly assigned nurse was very much apprehended by being a surgical assistant nurse and was very much fearful about that, but eventually, she was doing that with steadiness and with increased desire to have more working experience

The health care system of the Egyptian Oasis has jumped into substantial improvement in the past 30 years, however, it need more and more aggressive effort to achieve its optimum goals.

Prevention of blindness programs are important for curing different ocular disease and prevent their progression .

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