

# The Importance of Computerized Documentation in Medical Sciences Ophthalmology is a Prime Example



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**Submission:** June 18, 2017; **Published:** September 15, 2017

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## Abstract

Computerized documentation of 54000 consecutive ophthalmic cases was done. It includes programs that perform simultaneously analysis of clinical data each time when new patient's information was added. "Development of Ophthalmology in Jordan" Important information came out that ophthalmologist can't realize within their daily practice and enriched us with ideas for better understanding of systemic diseases as well as indications for community health services, especially the field of prevention of visual impairment and blindness. Some examples are demonstrated.

## Introduction

In 1982, I had little idea about the development of Computers Information Systems. Nevertheless, I developed my own documentation program in writing by translating the patients Information and clinical data in numbers. When the new Laptops with their high capacity were developed, this system was implemented and improved 1991 by introducing program that does simultaneous analysis of clinical data when new patient's information was added. Until today, data of 54000 consecutive ophthalmic cases were entered. This presentation includes only few of important information that ophthalmologists will rarely experience within their daily practice.

## Materials

The complaints, clinical findings, diagnoses, as well as surgical and medical treatment of 54000 consecutive cases were entered into the computer Riboflavin-

## Results

About 16% of all patients came from 82 countries for treatment, Table 1. Some are employees of foreign offices, some are working either as farmers, or in construction and House-keepers. Most patients came from neighboring Arab countries. It is suggested that outreach programs to be introduced in North Saudi, Yemen and Sudan to establish specializes hospitals that provide high standard, specialized medical services and human resources development. This community service will encourage

inter-country cooperation and interaction to facilitate health care in needed areas, improve economy on both sides and support peace process in the Middle East.

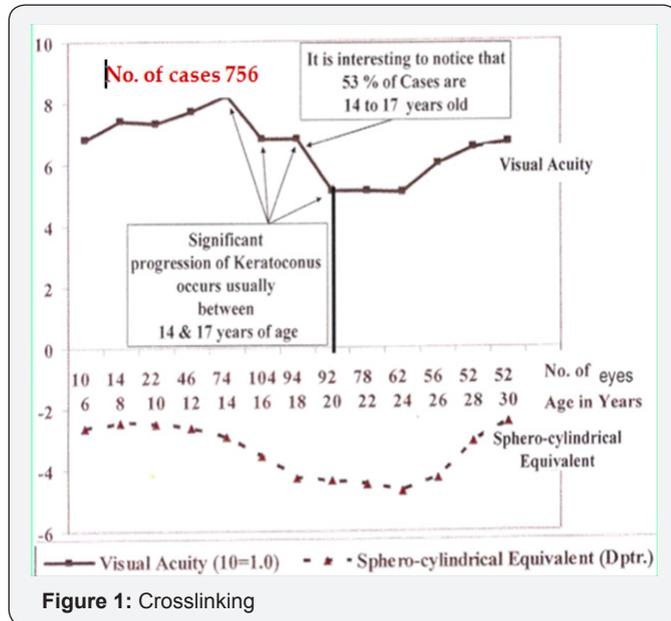
**Table 1:** Ratio of Jordanian patients 84%, Arabs 13.8% + foreigners 2.12% = 15.92% Coming from 82 countries.

Country/State	Total	Female	Male
Jordan	84.08	42.83	41.25
Arab States	13.8	5.74	8.06
Far East	0.95	0.78	0.71
Europe	0.72	0.39	0.33
Africa	0.03	0.02	0.01
Others	0.42	0.24	0.18
Total	100	50	50

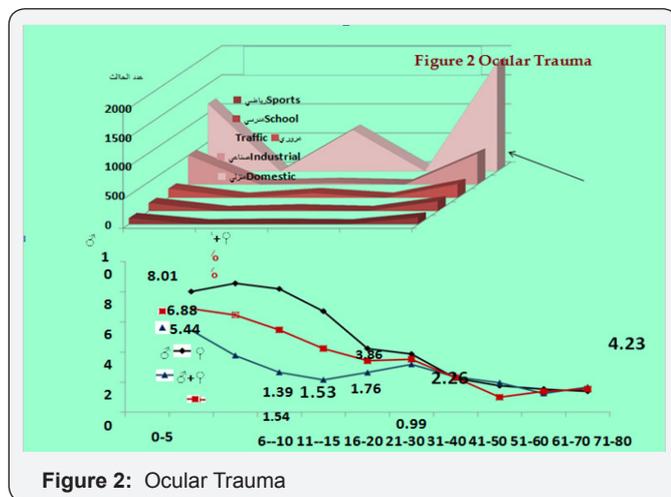
## Keratoconus

Keratoconus represents 2.28% of examined cases. It is known that if patients show signs of progression at the age of  $\geq 20$  years, UVA - Cross-linking becomes indicated to prevent further deterioration. Figure 1 show clearly that progression occurs in general between the ages of 10 and 17 years in 53% of the cases, and almost all other cases did not progress after the age of 20 years. Progression after the age of 20 is extremely rare. If the aim of cross linking is to prevent Keratoconus from progression, then it is important this procedure to be applied during the younger ages, at the stage of ocular growth. We know

that cross linking destroys the Keratocytes. The question arises, could this procedure affect the growth of the cornea or develop post procedural Keratopathy? Studies have to be done in order to answer this very important situation. Unexpectedly few cases of Keratoconus show improvement of vision and spherocylindrical equivalent at the age of  $\geq 24$  years.

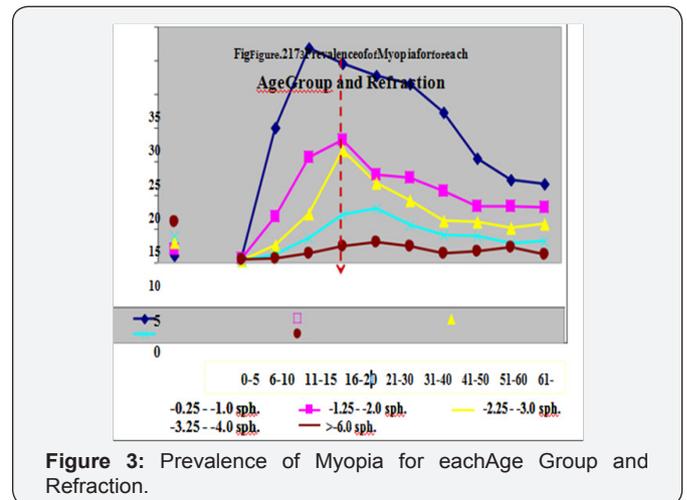


Ocular Trauma



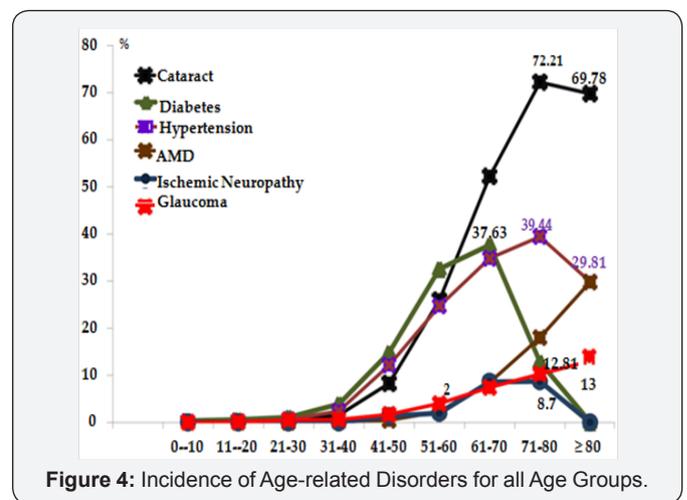
Ocular trauma independent of age occurs by 5.53% of the cases. The ratio male to female is 2.3:1. The most common trauma is domestic injury 3.5%, followed by industrial 1%, then traffic 0.44% and school with sport traumas together 0.53%, Figure 2. The ratio between rights to left is 1.65:1. It is interesting to notice that children are mostly involved in domestic injuries. 8.01% are five or less " $\leq 5$ " years old and 16.57%  $\leq$  than 10 years of age. Unilateral visual impairment occurs by 7.9% and unilateral blindness by 21.3% of the cases. Community education is very important to prevent visual impairment and blindness caused by domestic injuries.

Refractive Surgery



Myopia recurs after refractive surgery in 14-24% of the cases [1]. Refractive surgery is usually done at the age  $\geq 20$  years. Figure 3 shows that myopia of equal or more than " $\geq -3.25$ " diopters tends to increase up to the age of 30 years. Persons belong to this category has to be informed about this fact, so that they decide to wait or to take the risk of a possible re-enhancement if needed in future.

Aging Disorders



Age related disorders begin at the age of 40 years and increase with aging Figure 4. These are Diabetes, Hypertension, Ischemic Neuropathy, Cataract, Glaucoma and Age Related Macular Degeneration [2,3]. They are correlated with each other Figure 4. The prevalence of diabetic patients starts to decrease at the age 61-70 years, earlier than other aging disorders. Table 2 shows that the following ischemic diseases, Amaurosis fugax, Aortic aneurysm, Myocardial infarction, Deep vein Thrombosis, Gangrene, Pulmonary Embolism, Renal Failure and Stroke are more common present by diabetics than none diabetics. Insulin treated patients are also more commonly affected by these ischemic diseases than patients receiving alternative medicines.

The following Ischemic disorders; “Hypertension, Vascular Obstruction and ischemic Neuropathy”, (Table 3), show also that Diabetes is five times more affected, Age related Macular Degeneration four times and Glaucoma three times more

**Table 2:** Incidence of Ischemic Disorders by Diabetic Patients compared with Non-Diabetics.

Non Diabetics	%	Alternative Medicine Treatment	Insulin Treated	Diabetic Patients
49796	4204	3170	1034	No. of Cases
	0.29	0.27	0.36	Amaurosis Fugax
	0.03	0.04		Aortic Aneurysm
0.34	1.64	1.37	2.05	Myocardiac Infarction
	0.09	0.12		Deep Vein Thrombosis
	0.21	0.15	0.36	Gangrene
	0.03	0.04		Pulmonary Embolism
0.05	1.85	1.2	3.86	Renal Failure
0.12	2.11	1.7	3.37	Stroke

**Table 3:** Incidence of Ischemic Disorders Associated with Aging Diseases. Compared with healthy Cases.

Others	Glaucoma	Age Related Macular Degeneration	Diabetes	Diagnosis
5.8	21.5	25.4	27.9	Hypertension 2532
0.6	4.3	2.1	3.4	Vascular Obstruction 296
0.4	0.7	0.5	3.1	Ischemic Neuropathy 194
6.8	26.5	28	34.4	□

Investigations at molecular level have shown that all these aging disorders suffer from oxidative stress, Oxidation and Oxidative damage [2,3]. Antioxidants are therefore applied to prevent further deterioration of very sensitive organs of human body. Prophylaxis on the other side has to be started at earlier, may be at age of 35 years. This matter needs further investigation. I have an Idea to achieve this goal, but needs further investigations. Once this goal is achieved it might be possible to reduce the prevalence of aging disorders, the severity of its complications and prolong age.

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DOI: [10.19080/JOJO.2017.04.555644](https://doi.org/10.19080/JOJO.2017.04.555644)

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