

The Profile of Eye Disease in Palestine: An 8-year Experience at St. John Eye Hospital, Hebron

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Abstract

Objectives: We aimed to profile the spectrum of eye conditions and document the change in cases presenting at St John Eye Tertiary Hospital, Hebron, Palestine. **Patients and Methods:** Charts of all new patients who presented to St. John Eye Hospital, Hebron, Palestine, between 2006 and 2013 were reviewed retrospectively. Age at presentation, sex, and clinical diagnosis were extracted from medical records. Data were stored and analyzed. **Results:** The records of 33,183 patients were included in the study. Female:male ratio was 1:1. Patients aged 10–19 years were the largest group (18%–24%). Refractive errors were the most common disorders seen (22%–32%). This was followed by conjunctival diseases (20%–24%) and cataract (8%–13%). Diabetic patients represented 7% of the total. Proliferative and nonproliferative diabetic retinopathy increased over the study period. Refractive errors and cataract were more frequent in females than males, while ocular trauma was more prominent in males than females. **Conclusions:** The most common cause of ocular morbidity in this study was refractive errors. Most of the morbidities seen in this study were either treatable or preventable. Programs that raise the capacity of health providers and screening programs should be conducted regularly and preferably in partnership with all health service providers.

Keywords: Cataract, conjunctivitis, diabetic retinopathy, Palestine, refractive errors

INTRODUCTION

Eye diseases are important reasons for medical consultation. Data on causes of vision impairment are essential for the development of public health policies and health service planning.^[1,2] Worldwide, the leading causes in 2010 for visual impairment were uncorrected refractive errors, cataract, and macular degeneration.^[1,2] Ethnic and cultural factors superimposed by geopolitical and economic factors affect the prevalence of diseases among different populations.

Only a few studies documented the eye disease pattern in the region of the Middle East and North Africa.^[3-7] This study, besides being among the first few of its kind in the region, reports from Palestine, a country with its unique political situation.

We aimed to determine the distribution and change of spectrum of eye diseases at St. John Eye Hospital over an 8-year period. The information provided in such study provides a starting point for planning and prioritizing of local and national eye health program in Palestine.

PATIENTS AND METHODS

Settings

St. John Eye Hospital, Hebron, serves as a referral center for the Hebron Governorate (size: 1060 km² with a population of approximately 700,000 inhabitants). St. John also provides primary and secondary eye care services to walk-in patients. At the first visit, all patients had a full ophthalmic evaluation, including visual acuity, refraction/cyclorefraction, carried by an optometrist and an assessment of ocular motility, intraocular pressure, slit-lamp examination, and dilated ophthalmoscopy carried out by a consultant ophthalmologist. Tests were conducted to elicit a diagnosis, and management initiated as required. Consultations with subspecialists were made as necessary. At the end of the consultation, one or more diagnoses are recorded in each patient's chart.

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Design

Charts of all new patients who presented to St. John Eye Hospital, Hebron, Palestine, between 2006 and 2013 were retrospectively reviewed. Ethical approval of the study was obtained from St. John Eye Hospital Ethics Committee. Confidentiality of the study was maintained by concealing the names of patients.

Dataset synthesis

Age at presentation, sex, and clinical diagnosis were extracted from medical records. One principal diagnosis representing the main complaint about the outpatient services sought. The clinical diagnoses were grouped as appropriate into anatomical categories [Table 1]. Patients were classified by age. Patients who presented for a medical checkup and had no eye disorders were excluded from the study.

Data analysis

Data were stored and analyzed using Wizard Data Analysis version 1.8.5 (Evan Miller, Chicago, Illinois, USA). Results were summarized using descriptive statistics as absolute or relative frequencies. Relations were explored and Chi-square test was used to compare variables, and $P < 0.05$ was considered statistically significant.

RESULTS

Patients' profiles

We evaluated charts of all the new patients who were seen during the study periods 2006–2013 (n : 4986, 4847, 5473, 5238, 4528, 3974, 3615, and 3436). Patients who had no eye disorders ranged 7%–10% and they were excluded. The highest frequency of consultation was recorded among the age group of 10–19 years. The highest frequency (25.2%) was in 2009 and lowest (18%) in 2013 [Figure 1a]. The review was done on 33,183 patients. A minimal female excess (50.3%) was seen [Figure 1b].

General patterns of eyes diseases

Refractive errors were the most common disorders seen (22.0%–32%), followed by conjunctival diseases (21%–24%) and cataract (8%–13%). The relative frequency of various conditions expressed as the mean percentages is presented in Figure 2. The frequency and pattern of eye diseases varied across age groups [Table 2]. The difference in the presentation by age group was particularly evident in refractive errors among the age groups of 5–9 and 10–19 years ($P < 0.001$). Conjunctival diseases were frequent among the age groups of 5–9 years up to 40–49 years ($P < 0.001$). Cataract was common among patients in the age groups of 50–59 and 60–69 years.

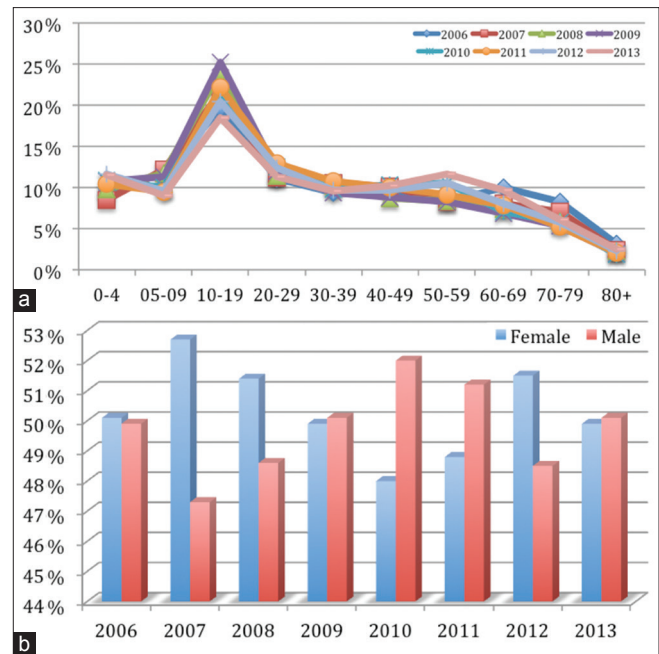


Figure 1: Distribution of the study population by age (a) and gender (b) percentages over 9 years of the study

Table 1: Anatomical and clinical categories and subcategories used to classify conditions included in the study

Conjunctiva: Conjunctivitis (bacterial, viral, allergic), vernal keratoconjunctivitis, dry eye, pterygium, others	Lens: Cataract, dislocated/subluxated lens, others	Diabetes mellitus: Proliferative DR, Nonproliferative DR, no DR	Refractive errors: Any
Lids: Ptosis, chalazion/stye, trichiasis/distichiasis, blepharitis, entropion, ectropion, others (including tumors)	Orbit: Orbital/preseptal cellulitis inflammatory disease, vascular lesions, thyroid eye disease, others (including tumors)	Cornea/sclera: Keratitis (bacterial, viral, fungal), keratoconus, bullous keratopathy/dystrophy, scleritis, episcleritis, others	Iris/CB/choroid: Anterior U, posterior U, others (including tumors, malignant melanoma, metastasis, choroidal disease)
Glaucoma: Ocular hypertension, normal tension G, open-angle G, angle-closure G, PXF G, secondary G, neovascular G, others	Retina/vitreous: Retinal detachment and breaks, RVO, RAO, endophthalmitis, macular disorders (ARMD, myopia, toxic), hereditary fundus dystrophies (Best's, Stargardt's, albinism cherry red, RP), others (including retinoblastoma)	Neuro-ophthalmology: Papilledema, optic neuritis, anterior ischemic optic neuropathy, abnormal papillary reaction/strabismus, nystagmus, migraine/myopathy/neurofibromatosis, others	Ocular trauma: Nonpenetrating, penetrating, eyelid laceration, hyphema, chemical, blunt trauma, corneal foreign body, others (including subconjunctival hemorrhage)
Strabismus and amblyopia: Convergent S, divergent S, vertical S, amblyopia, Duane syndrome	Congenital disorders: Congenital G, congenital cataract, retinopathy of prematurity, others (including tumors)	Lacrimal apparatus: Nasolacrimal duct obstruction, dacryocystitis (acute/chronic), others	Miscellaneous: Unclassified elsewhere

DR: Diabetic retinopathy, G: Glaucoma, S: Strabismus, U: Uveitis, ARMD: Age-related macular disease, RP: Retinitis pigmentosa, RVO: Retinal vein occlusion, RAO: Retinal artery occlusion, PXF: Pseudoexfoliation, CB: Ciliary body

Ocular trauma was statistically significant among adults in the age groups of 20–29 and 30–39 years ($P < 0.001$). Diabetes frequency increased among older patients in the age groups of 40–49, 60–69, and 70–79 years ($P < 0.001$).

Refractive errors, cataract, diabetic retinopathy, and strabismus

Refractive errors were recorded more frequently and statistically significant (Chi-square, $P < 0.001$) among the age groups of 5–9 and 10–19 years and represented the most common disorders seen (mean 26%). Figure 3a shows the frequency of refractive errors across study periods. Cataract was more frequent among the age groups of 50–59 and 60–69 years (Chi-square, $P < 0.001$) and represented the third most common disorder seen (mean 10%). Figure 3b shows the frequency of cataract. Diabetic patients represented 7% of cases seen and were more frequent among patients in the three age groups, i.e., 40–49, 60–69, and 70–79 years (Chi-square, $P < 0.001$). All three categories (proliferative, nonproliferative, and no diabetic retinopathy) showed a steady increase over the study periods [Figure 3c]. Strabismus and amblyopia cases represented 6% of cases and were more particularly common among young children in the age group of 5–9 years (Chi-square, $P < 0.001$). Convergent strabismus was the most frequent type. Refractive errors, cataract, and lid and lacrimal diseases were seen more in females than males. Diabetes was more frequent among women in the first 6 years of the study. Ocular trauma and conjunctival

disorders and retina/vitreous morbidities were more prominent in males than females [Table 2].

Ocular trauma and conjunctival disease

Ocular trauma represented the fifth most common disorder seen (mean 7%) and was statistically significant (Chi-square, $P < 0.001$) among adults in the age group of 20–39 years. Non-penetrating injuries and corneal foreign bodies were the most frequent presentations recorded [Figure 4a]. Conjunctival diseases were more frequent among all four age groups (5–49 years) (Chi-square, $P < 0.001$). It represented the second most common disorder seen (mean 22%). Conjunctivitis (bacteria, viral, and allergic) was the most common diagnosis recorded. Figure 4b shows frequency and distribution of conjunctival diseases. Lid diseases were the fourth most common presentation in our study (mean 8%) and were statistically significant among the age group of 10–29 years (Chi-square, $P < 0.001$). Chalazion/stye and

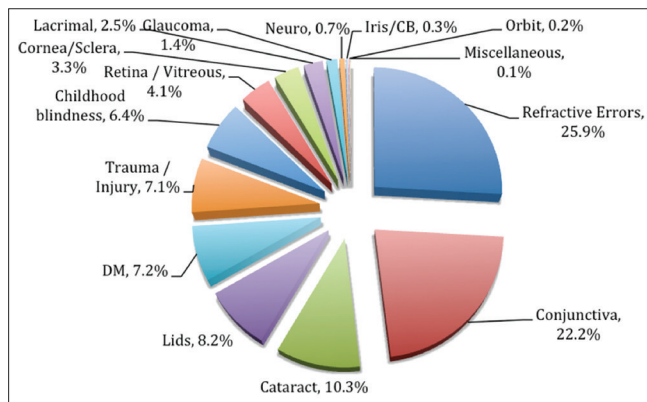


Figure 2: The relative frequencies of various eye conditions seen during the study period

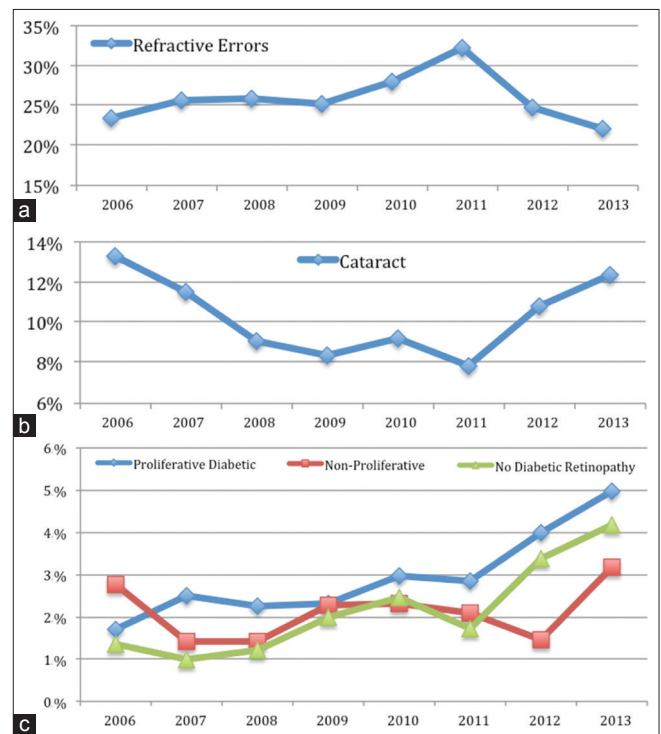


Figure 3: The trends of the major primary eye conditions over the study years, namely, refractive errors (a), cataract (b) and diabetic retinopathy (c)

Table 2: Relative frequency of common five presentations by year and gender

Year	Sex	Conjunctival diseases (%)	Cataract (%)	Diabetic eye disease (%)	Strabismus (%)	Refractive errors (%)
2006	Female/male	5.2/5.8	7.8/5.5	3.2/2.6	4.2/3.3	13.0/10.3
2007	Female/male	8.0/6.6	6.4/5.1	2.7/2.2	2.9/2.7	15.5/10.1
2008	Female/male	6.3/6.6	4.6/4.5	2.7/2.2	2.3/1.8	15.4/10.4
2009	Female/male	6.3/6.6	4.6/4.5	2.7/2.2	2.3/1.8	15.4/10.4
2010	Female/male	5.6/6.1	4.9/4.3	4.0/3.8	2.1/2.2	15.3/12.6
2011	Female/male	5.2/6.0	3.9/3.9	3.4/3.3	1.9/1.6	17.9/14.3
2012	Female/male	6.5/7.4	6.0/4.8	4.1/4.8	2.0/2.4	15.4/9.6
2013	Female/male	6.0/4.4	6.3/6.1	6.1/6.3	2.3/1.9	11.7/10.3

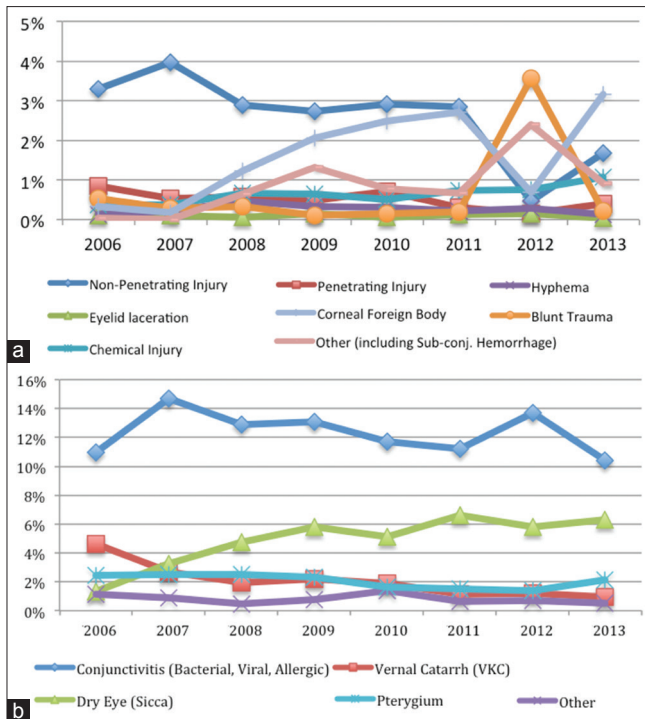


Figure 4: Trends in the relative frequencies of types of ocular trauma (a) and conjunctival conditions (b) over the study period

blepharitis were the most common presentations recorded in this category.

DISCUSSION

To the best of our knowledge, this is the first study on the spectrum of eye diseases in Palestinians. Convenience sampling (proximity and availability) prevents this study from assuming to be a representative of the population. Our results show that refractive errors and cataract were the first and third most common morbidities seen for all age groups in this study, which is consistent with other reports, in which uncorrected refractive errors were first^[1,2] and cataract was second.^[1,2]

Refractive errors were the most common disorders seen (22%–32%) in the whole sample and they were the most common morbidity seen in the 5–19-year-old children, in agreement with reports from China, Bengal, Brazil, Australia, and Kathmandu.^[8-12] Refractive errors affect childhood development, and in the absence of regular preschool or school eye screening for refractive errors, many children with refractive errors may go unnoticed and will not benefit from such simple solution (a pair of glasses!). Refractive errors in children aged 5–19 years increased up to 2011 but later on showed a steady decrease. This could be partly attributed to a “vision screening program” that was conducted in 2008 by St. John Eye Hospital in Hebron and targeted members of the School Health Program (Ministry of Health, Hebron) who were conducting vision screening. The objectives of the program were to raise the screener’s awareness and capacity in terms

of better detection of refractive errors and proper referral to optometric services for glasses.

Conjunctival diseases (56% of which were conjunctivitis) were the second most common disease seen for all age groups in this study (20%–24%) and were increased among the age groups of 5–9, 10–19, 20–29, 30–39, and 40–49 years. Our findings concur with previous reports that allergic conjunctivitis is the most common disorder in children.^[13-17] Although conjunctivitis does not result in blindness, it is one of the leading causes of absence from school in children and from work in the adult population with potentially serious implications on education and productivity.

Cataract was more common in the age groups of 50–59 and 60–69 years. Cataract represented the third most common disorder seen in this study affecting one in ten on average in agreement with several previous studies.^[1,2] Cataract was the leading cause of blindness (55.0%) in the Occupied Palestinian Territories^[18] and the leading cause of visual impairment in older Americans.^[19] Globally, cataract represents the second most common cause of moderate and severe vision impairment in North Africa and Middle East (18.0%).^[1] Cataract is also the second most common cause of avoidable visual impairment (33%)^[2] worldwide and the third most frequent cause of incidence of bilateral visual impairment in Australia.^[11]

Diabetes mellitus represents the fifth common cause of presentation in this study (around 7%). It is noteworthy that percentages of diabetic patients with no signs of retinopathy were increasing from 1% to 4% over the study period, while the percentages of diabetics diagnosed with proliferative retinopathy also showed an increase from 2% to 5% over the study period. Diabetic retinopathy represented the fifth cause of moderate and severe vision impairment in North Africa and Middle East (2.4%) and the fifth cause of blindness (3.5%).^[1] There are limited data on the prevalence of diabetes mellitus and diabetic retinopathy in Palestine. One study suggested that the prevalence of diabetes in men and women aged 30–65 years was 11.3% and 13.9% in rural and urban populations, respectively,^[20] and another study reported self-reported diabetes mellitus at 26.4% in the over 50-year-old people.^[18] In 2012, St. John of Jerusalem Eye Hospital, in partnership with the United Nations Relief and Works Agency for Palestine Refugees, initiated a 3-year screening, treatment, and management program for diabetic retinopathy among diabetic patients in East Jerusalem and the West Bank, including the refugee population of the southern districts of the West Bank (Bethlehem and Hebron). The program aimed to reduce the proliferation of preventable diabetic retinopathy in the occupied Palestinian territory. An estimated 40,000 patients were screened over 3 years of the project. The primary objective of the screening component of the project was to detect the maximum number of cases of sight-threatening retinopathy and refer them for further examination and management by an ophthalmologist

while retaining those with nonsight-threatening disease under periodic review. The final outcomes of the program are eagerly awaited. In the older age groups, the present study demonstrated that diabetes mellitus and cataract are significantly increased. This association may explain the earlier report of posterior segment disease being found in proportionally more patients presenting with “borderline” and “poor” outcomes postphacoemulsification and that the majority of these patients had diabetic retinopathy.^[21]

Trauma and injury affected 7% of all cases seen in this study and were significantly increased in young adults in the age groups of 20–29 and 30–39 years. Nonpenetrating injury and corneal foreign bodies represented 59.5% of cases in this category. The high frequency of injuries in these age groups can be attributed to work in construction by this age group and the common neglect of protective goggles at work. Our results are at variance from different previous reports where trauma injury in children ranked as the first, second, third, or fourth most common disorder.^[14-16,22]

Strabismus and amblyopia represented 6% of all cases seen in our study and were particularly seen in the age groups of 0–4 and 5–9 years. Other studies showed that for children aged 0–15 years, trauma was the most common morbidity in Nigeria,^[22] allergic conjunctivitis was the most common in Ethiopia,^[13] and refractive errors were the most common form in China,^[8] Bengal,^[16] and Iraq.^[17] Furthermore, refractive errors were the most common morbidity seen in patients between 5 and 19 years’ age group, and strabismus was most commonly seen among the 0–9-year-old children. The study also lends support to the reported association between refractive error and specific forms of strabismus.

The study is limited by its retrospective design, hospital chart rather than whole community as the basis, and potential for selection bias introduced by self or professions referrals. These limitations could have increased the number of more severe cases and consequently overestimated the frequency and morbidity of eye diseases in our sample compared to the background population. However, the study remains the first study of its nature in Palestine, and being from a large referral hospital, it must reflect the spectrum of ocular morbidity in our community.

CONCLUSIONS

The most common causes of ocular morbidity in decreasing frequency were refractive errors, conjunctivitis, cataract, chalazion/stye and blepharitis, diabetic retinopathy, nonpenetrating trauma and foreign body, and convergent strabismus. Most of these morbidities are either treatable or preventable and require attention of all health professionals for complete management because they lead to visual impairment and probably blindness. Programs that raise the capacity of health providers and screening programs should be conducted regularly and preferably conducted in partnership with all health service providers.

Authors’ contributions

The author is responsible for conception of the study, data collection and analysis and for drafting, revising and approving the final version of the manuscript.

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Nil.

Conflicts of interest

There are no conflicts of interest.

Compliance with ethical principles

Ethical approval was granted by the St John’s Hospital Ethical Committee. All data were de-identified before analysis. No consent was possible in such a retrospective study.

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