

ORIGINAL ARTICLE

Examining Molecular Genetic Cataract regarding Congenital Nuclear Disorders

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ABSTRACT

The objective of current research is presenting a descriptive report from rate of suffering from congenital cataract. This research is conducted on medical record of 90 patients suffering from cataracts hospitalized in Imam Khomeini hospital. The results are suggesting that the number of 40 persons that gone to Imam Khomeini hospital due to cataract have had congenital genetic reasons for the disease. Also the rate of cataract affliction due to congenital reasons was greater in boys than girls.

Keywords: Molecular genetic disease, eye cataract, congenital abnormalities nuclear

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INTRODUCTION

One of healthcare problems of countries around the world especially poor countries is presence of low vision or totally blindness in age different groups. Prevalence of this impairment is reported as 3.1 percent. According to world health organization near 180 million persons around the world suffer from visual impairment that 45 million persons of them suffer from severe decrease at the degree of blindness. It is expected in case of failure in prevention and adequate treatment until 2020, this number will reach to 54 million. Approximately 90 percent of world blinds are living in developing country especially in Asia and Africa and most of them are gathered in undeveloped rural communities and urban crowded regions. This is while that 80 percent of case are preventable or treatable [1].

Social and economic repercussion of low vision or blindness is extremely significant including decrease of attention to life quality, production decrease and spending huge health cost for caring these individuals. amount of prevalence of low vision and blindness depends on different factors such as age, gender, race, geographical region and socioeconomic status and environmental conditions and therefore different reports are presented for patient features and causes of low vision and blindness [2]. In developing countries the major causation of low vision and blindness is cataract, glaucoma, and retinal and infectious diseases while in industrial developed countries the most important cause of low vision at older age is age-related Macular degeneration and in working age it is diabetic retinopathy [3].

Cataract takes place when the transparent crystalline lens becomes opaque. Congenital cataract leads in developing a range of disease that emerge since birth time or in childhood and they are referred as congenital cataracts. Congenital cataracts is the main etiology of children blindness and is causation of 1 to 6 cases in every 10000 infants in developed regions of developed countries and 5 to 15 cases in every 10000 cases in poor regions of such countries [4] [5]. Genetic congenital cataract included one fourth of all cataract cases. Genetic congruence of this disease can be identified through presence of casual mutation in at least 2 important structural and functional genes in the lens, meanwhile the existing mutations are known in 10 agent transparent genes of 50% of types of mutations [6].

Causes of cataracts

Most prevalent of cataract is age-related.

Other causes of cataracts are as follows:

- ✓ Family history having cataract

- ✓ Medical problems such as diabetes
- ✓ Eye Trauma
- ✓ Prolonged medication such as cortisone
- ✓ Prolonged and unprotected exposure to sunlight
- ✓ Eye surgery history

From point of view of traditional medicine cataract etiology includes increase of phlegmatic dense humidity in the head and body and its flow into eyes [7] [2].

Symptoms of cataracts

The most prevalent symptoms is low vision without pain and eye inflammation. Another symptom is seeing colorful halos around glossy objects or the straight edges of objects may be seen as wavy or curved edges. Strabismus of one eye, change in perception of colors, seeing dark fixed points are among symptoms of this disease. Among children behavioral changes. Inability of seeing blackboard and deficiency in study may be observed [8] [9].

Types of Cataract

✓ Congenital cataract

This type of cataract occurs in childhood, it can be genetic or the consequence of utero infection or due to metabolic diseases. In some cases it occurs without any clear reason. Congenital cataract is relatively prevalent and it may be observed in one child among every 2000 born children. Though all of types of this cataract does not need any treatment, but all sufferers should be examined by ophthalmologist [7].

This kind of cataract may be severe so that the infant's pupil is seen white that it is referred as "leukocoria", or can be mild that is diagnosable just by ophthalmologist examination. For the same reason it is necessary that the infant be subjected to ophthalmology examination after its birth and before dismissing from hospital. All infants after birth are visited in terms of eye problems by pediatrician, but regarding to alteration of onset age of these problems it is necessary that parents reports any kind of changes in visual behaviors or children eyes unnatural movements to ophthalmologists. The importance of cataracts in the children is because if these problems fail to treat on time it leads in amblyopia, that its treatments can be difficult and sometimes it is impossible until age of 9 years in case of failure of treatment [5].

Cataract arising from disease or medications

These cataracts develop usually due to other disease or previous eye surgery or as repercussion of some medication usages. For example diabetes sufferer often is more subjected to affliction to cataract and steroids (corticosteroid) can increase the risk of having cataract. Diabetes sufferers not only may catch cataract more than ordinary individuals, but also this disease occurs in earlier ages [4].

Traumatic cataract

This type of cataract develops as consequence of eye damage within a severe trauma. Traumatic cataract may emerge suddenly and due to trauma or even several months or years after the primary damage [10].

Cataract diagnosis

The only way to definite diagnosis of cataract is examining the lens after dilatation of pupil (where the eye pupil is widen to the size of a droplet). Then the ophthalmologist can diagnose the cataract symptoms by looking at the lens.

✓ Examining with slit lamp

The ophthalmologist observes the cornea, iris, lens, and the interval between lens and cornea. By this special microscope the physician can observe your eye with accuracy and magnification and in details and diagnose unusual parts [2].

✓ Determining visual acuity

This experiment determines your visual acuity. Each eye is examined separately by seeing letters in different sized from distance of 4 or 6 meters/visual acuity is an incomplete representation of visual function index, that for any person is different on the basis of professional and social needs. For example a visual acuity may be quite natural for a householder eight years old person, but the same acuity can be source of problem for a sixty years old socially active person [11].

✓ Retina examination

When your pupil becomes dilated, the physician can observe behind of your eye better. Using slit lamp or a device known as ophthalmoscope, the physician examines the cataract in the eye. Also he seeks for symptoms of glaucoma other eventual problems in the retina and the visual nerves [3].

RESEARCH METHOD

The current research is of descriptive type that presents a report from affliction of individuals to genetic congenital cataract. Statistical society of study is all individuals in Tehran Imam Khomeini hospital in

2011 that have been subjected to cataract surgery. Among number of 90 studied persons 40 patients suffered from congenital cataract [12].

RESULTS

Table 1. Frequency of sample people in terms of type of affliction to cataract

variable	Frequency	Frequency percentage
Congenital genetic causation	40	44.44
Other causes	50	55.55
Total	90	100

Regarding to results shown in the table, number of 40 person of individuals with cataract have been had congenital etiology and number of 50 persons of them have afflicted to this disease for other causes.

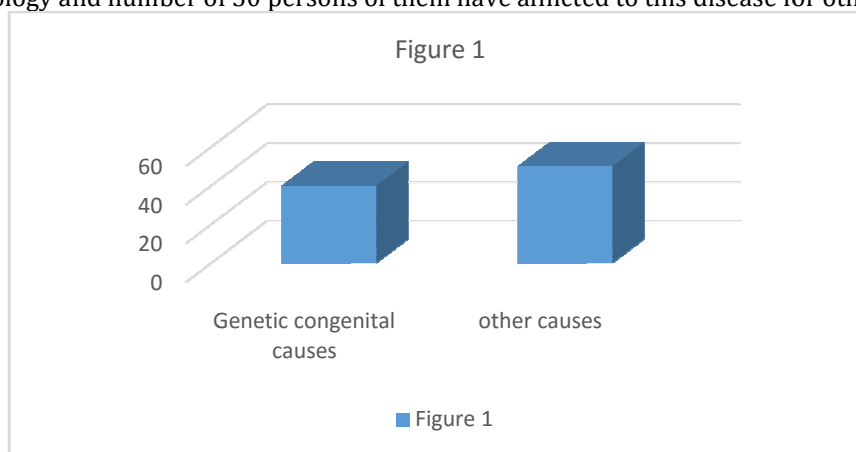


Figure 1. Frequency distribution of patient in terms of type of affliction to cataract

Table 2. Frequency distribution of patient suffering from congenital cataract in terms of patient's eye

variable	Frequency	Frequency percentage
Right eye	12	30
Left eye	28	70
Total	40	100

Regarding to table results, number of 12 persons among patient in the right eye and 28 patients in the left eye have suffered the genetic cataract.

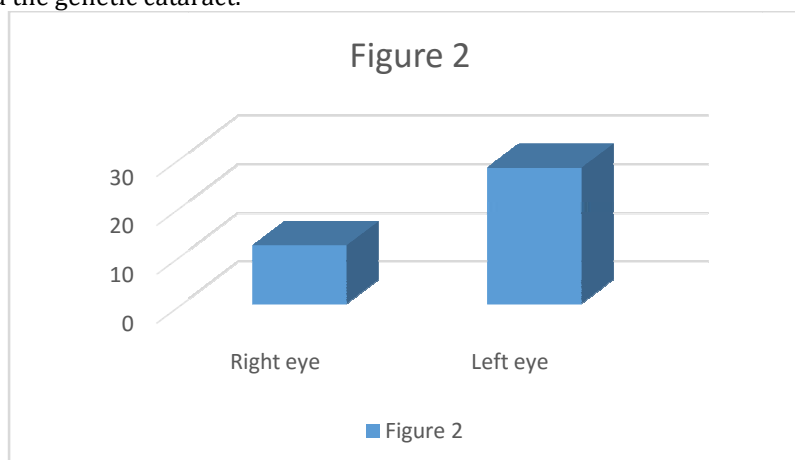
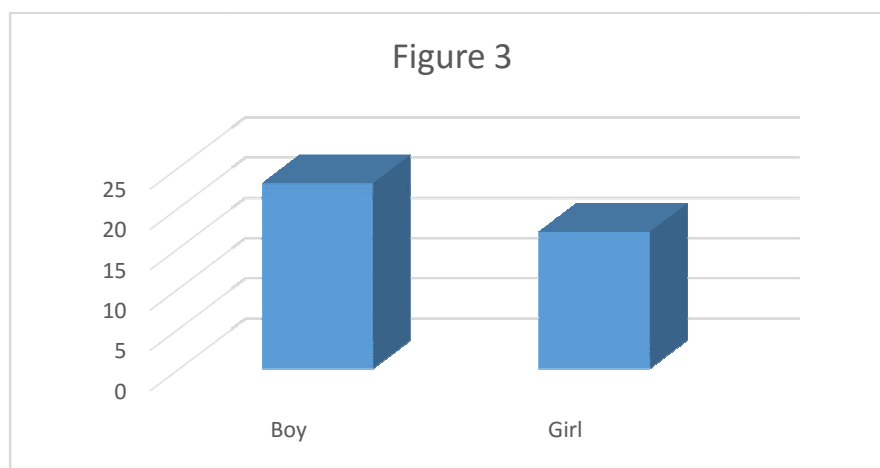


Figure 2. Frequency distribution of patients with congenital cataract in terms of patient's eye

Table 3. Frequency distribution in terms of gender

variable	Frequency	Frequency percentage
Boy	23	57.5
Girl	17	42.5
Total	40	100

Regarding to results shown in the table 57.5 percent of studied children were boys and 42.5 percent were girls.

**Figure 3. Frequency distribution in terms of gender**

DISCUSSION AND CONCLUSION

One of health problems of countries around the world and especially poor countries is existence of low vision or blindness at different age groups. In developing countries the most causation of low vision or blindness is cataract, glaucoma, retina diseases and infectious diseases, whereas in developed and industrial countries the most important cause in low vision at elder ages is age-related macular degeneration, and in working age it is diabetic retinopathy.

Prevention from vision disorders especially among children is an international necessity. Some genetic or congenital disorders, as well as some mental retardation influence on visual system resulting in absolute or relative blindness among these children. Using the VEP test and electrophysiological method is recommended. It is necessary to note that with adequate treatment measures such as screening, and on time diagnosis and treatment one can increase vision of a lot of patients and reduce its social and economic harm to great extent.

A comprehensive meta-analysis in 2009 has shown the universal inequality in exploiting visual healthcare in both genders in all age groups. The gender inequality pattern among adults are mentioned in other Middle Eastern countries. In this population-based study in Oman the greater prevalence of blindness is observed among elder women. A survey that has been conducted in Iran on citizens older than 50 years in Varamin province have revealed that the prevalence of severe visual disorder and low vision is significantly higher than men, though blindness was approximately equal among both sex.

According to study of Dr. Hashemi et al in Tehran it seems that cataract surgery services is available in Tehran, however, though untreated cataract is more prevalent among women but its reason cannot be attributed to availability of surgical services. In current study we have observed a significant difference in surgical age between girls and boys just for congenital cataract surgery for the second eye. Furthermore, at general the frequency of eyes subjected to surgery in boys is 10 percent greater than girls. The reason is not totally clear but the economic issues, lack of awareness about children cataract, inability of primary and secondary healthcare establishment in diagnosing and addressing patient and gender inequality are among some potential factors that have been discussed in some other studies. In study of Dr. Amini et al about distribution of causation of low vision and blindness by separation of gender in 260 students of Tehran blinds schools, the congenital cataract was the fourth causation of blindness among boys and among 6 percent of them it is known as the main etiology of blindness, but this was known only in 3.5 percent of girls as the cause of blindness and at general it was not one of 4 major factor of blindness among girls. Generally near 20 percent of studied eyes in this school have had cataract surgery history. The important point is that in this study approximately three fourth of student were boy and it is

probable that blind girl have enjoyed less whether in terms of using healthcare service or from educational considerations and most of them were not sent into school. Though proving this issue requires further examinations. Generalizability of this current study to whole of population is limited because maybe it does not encompass undiagnosed cases or those have not been diagnosed in private section.

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