JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

"Age Based Survey of Cataract in the Population of Amravati Region Maharashtra"

Milind Kale

Assistant Professor

Department of Zoology, Govt. Vidarbha Institute of Science and Humanities (Autonomous) Amravati,

Maharashtra, INDIA 444604

Abstract:

Over three-quarter of all blindness worldwide are preventable and usually caused by cataract. However data on the prevalence and risk factors about cataract are not easily available from eye hospitals in India. This study sought to determine prevalence and factors associated with cataracts in selected age group and area in Amravati District region in Maharashtra. Methods: A population-based cross-sectional survey was conducted on respondents aged in between 40 to 70 years and above in selected villages and urban area of Amravati District. Visual Acuity (VA) was evaluated as a semi- structured interview schedule was used for seeking study- related information. The schedules were initially prepared in English and further translated into the local language Marathi, back translated and examined for consistency. The standardized questionnaire was administrated verbatim during the interview. The section of the interview schedule contained questions about the participant's sociodemographic details (age, gender, education level, occupation type of family, etc.). The second section of questionnaire sought information on participant's awareness and health- seeking practices towards cataract.

Key Words: Literature survey, data collection, questioner

Introduction

Cataract is a natural part of ageing process, although occasionally children may be born with the condition. Cataract may also develop after an injury, inflammation or disease in the eye. Other risk factors associated with age-related cataract development are diabetes, prolonged exposure to sunlight, tobacco use and alcohol consumption. Most people start to develop cataracts after the age of 65, but some people in their forties and fifties can also develop cataracts. General Information on cataract. (Baush + Lomb, Baush.in). Age-related cataracts are the leading cause of blindness worldwide, affecting half the global population over the age of 50 years. In this modern technological world the only treatment for cataracts is surgery. Cataract disease occurs when proteins in the eye lens aggregate into opaque deposits, preventing clear vision. Over 90% of lens proteins are in the crystalline family, which maintain clear vision by retaining a high amount of native β-sheet secondary structures. Crystalline remain soluble for decades at high concentrations, since they are not regenerated in the organelle-free lens cells. While they are stable proteins, over time, UV light and other factors slowly damage crystalline, causing aggregation and, ultimately, cataract disease. Ariel M. Alperstein *et al.*, March 20, 2019 (PNAS, Vol 116 | No.14).

Anatomic variations can exist in the natural lens of the eye. Many different known and unknown congenital diseases can affect the lens in isolation or as part of a syndrome. Most often, these congenital defects present in the form of congenital cataracts or clouding of the crystalline lens. (Rachael Zimlich, BSN, RN, March 08,2022). Most congenital cataracts not associated with a syndrome have no identifiable cause, although genetic mutations are a common reason for cataract presentation. Cataracts at birth can present in one eye (unilaterally) or both eyes (bilaterally). Some of the syndromes associated with congenital cataracts include: (Rachael Zimlich, BSN, RN, March 08,2022). Galactosemia is a disorder caused by a deficiency of any one of three possible enzymes involved in the metabolism of galactose: galactokinase, transferase or epimerase. Any single deficient enzyme can result in cataract through the accumulation of galactitol in the lens. Rubella cataract is the most common ocular sign. The virus enters the lens before the development of the lens capsule that would otherwise act as barrier to the

virus. This may be the reason why rubella cataract is always at the foetal nuclear level and is frequently bilateral. Lowe syndrome is a condition that primarily affects the eyes, brain, and kidneys. This disorder occurs almost exclusively in males. Infants with Lowe syndrome are born with thick clouding of the lenses in both eyes (congenital cataracts), often with other eye abnormalities that can impair vision.

Down syndrome is a common genetic disease with a high rate of ophthalmic findings. Some manifestations are benign, such as epicanthal folds and Brush field spots, but Down syndrome is associated with lower visual acuity due to refractive error, astigmatism, amblyopia, nystagmus, and cataracts, among other disorders. The main ocular manifestations found in the Pierre Robin syndrome are congenital glaucoma and severe congenital myopia responsible for retinal detachment. Microphthalmia is infrequent. Hallermann-Streiff syndrome (HSS) is a very rare genetic disorder that has a characteristic facial appearance, dental abnormalities, hypotrichosis, skin atrophy, proportionate short stature, and ophthalmic features such as microphthalmia and congenital bilateral cataracts. Zellweger syndrome, also known as cerebrohepatorenal syndrome, is a rare inherited disorder characterized by the absence or reduction of functional peroxisomes. It is autosomal recessive and is due to a defect in the PEX gene. It is a rapidly progressive disorder with a high mortality rate. Trisomy 13, also known as Patau Syndrome, is a congenital malformation that leads to several ocular anomalies, of which cataracts are the most common, as well as iris and retinal colobomas. Some individuals with Conradi-Hünermann syndrome have clouding of the lenses of the eye (cataracts). Cataracts may be present at birth (congenital) or may develop during infancy. Cataracts may affect one or both eyes and can cause blurred vision or decreased clarity of vision. Most people affected by Ectodermal Dysplasia have normal vision and appear to have no greater need for glasses than anyone else. However, visual problems in Ectodermal Dysplasia may be caused by lack of tears, infections (conjunctivitis), corneal scars, cataracts and retinal changes. People with Marinesco-Sjögren syndrome have clouding of the lens of the eyes (cataracts) that usually develops soon after birth or in early childhood. Affected individuals also have muscle weakness (myopathy) and difficulty coordinating movements (ataxia), which may impair their ability to walk. Congenital cataracts may not be evident for some time, progressing until the lens takes on a cloudy color and the child's sight is impaired. About one-third of congenital cataract cases are hereditary (summary by Bu et al., 2002).

As you age, your natural lens also ages. Its flexibility is slowly lost, and, over time, the lens also becomes opaque, turning the natural clear lens into a cataract. When the lens loses elasticity, close-up vision is impacted, resulting in presbyopia. This is common for people over age 40. When this happens, people require reading glasses or glasses with bifocals to view images clearly up close. As lenses become clouded, a condition called cataracts develops**.** (Rachael Zimlich, BSN, RN, March 08,2022). Many cataracts take years to develop to the point where vision is seriously affected. Most occur as a result of the normal aging process. The types of age-related cataracts are usually described by their location in the lens. They are: nuclear cataracts, cortical cataracts and sub capsular cataracts. Nuclear cataracts occur in the centre of the lens and may induce other eye problems, such as myopia. A cortical cataract, which tends to occur more in persons with diabetes, begins at the outer portion of the lens, then slowly moves inward. Subscapsular cataracts develops under the capsule, often at the back of the lens. This type of cataract also occurs more in persons with diabetes, but it is also found in persons with high myopia, adults with retinitis pigmentosa and in people who take steroids.

Use of tobacco is a global issue and it is one of the major reason of developing cataract. Smoking is a risk factor for cataract development, but smokeless tobacco may be even more risky. In most of the region, smokeless tobacco is more common and it is in the form of snuff or chewing tobacco. Tobacco smoke contains hundreds of different substances, including nicotine, free radicals, and carbon monoxide, which can increase oxidative stress and have an important role in the pathogenesis of abnormal retinal correspondence (ARC). Influence of tobacco use on cataract development. (P Raju et al. July 12, 2006).

Sunlight is the principal source of ultraviolet radiation (UVR) for most of the world's population. Depletion of the stratospheric ozone increases the intensity of UVR. UVR is considered one of the major risk factors for cataract. Years of exposure to UV rays cause the protein in the lens of the eye to clump and thicken, preventing light from passing through it. This causes clouding and blurring of lens.

Material and Methods:

Study area:

Amravati is a city in the state of Maharashtra, India. Amravati is the 2nd Largest and most popular city of Vidarbha after Nagpur. It is also known as Cultural Capital of Vidarbha region because of its education facilities

and cultural heritage. It is the administrative headquarters of the "Amravati District" which is one of the six division of the state.

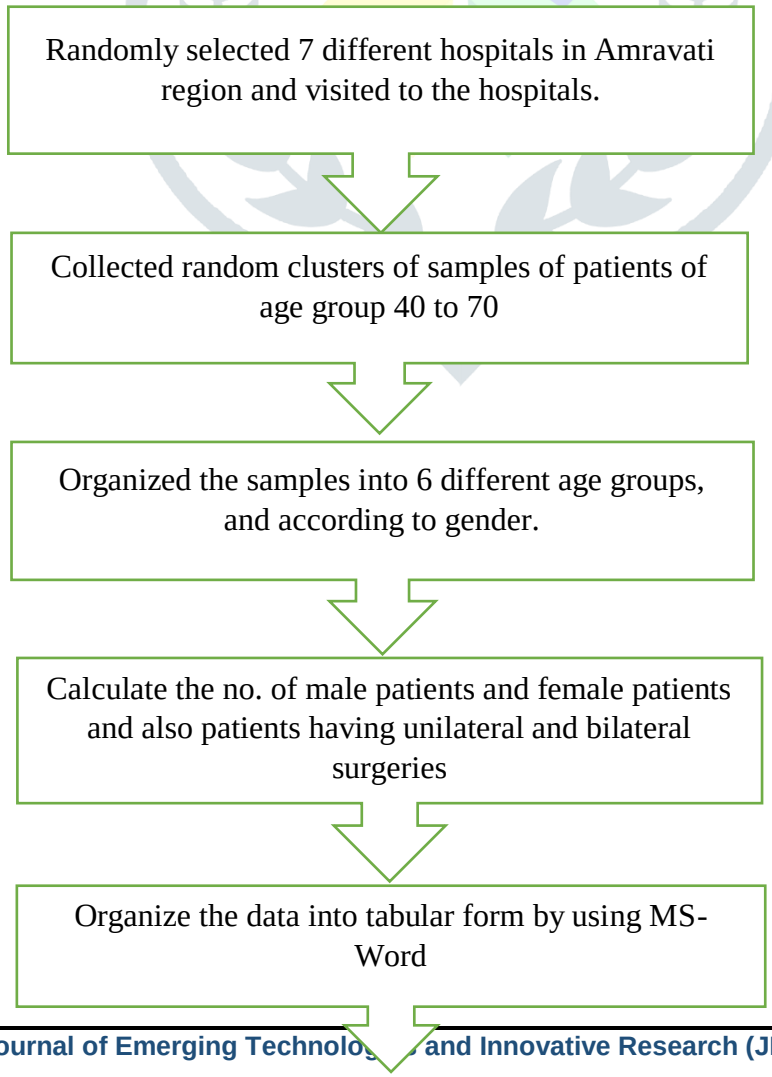
The district is bounded by Betul District of Madhya Pradesh state to the north, and by the Maharashtra district of Nagpur to the northeast. Chindwada district of Madhya Pradesh to the northeast Wardha to the east, Yaotmal to the south, Washim to the southwest.

- Study Duration : Data collected January 01, 2022 – December 31, 2022
- Study Type : Survey and data collection.

The reports from the year 2022, were taken from 7 different hospitals of Amravati region in which 6 hospital were urban and from the Amravati city and 1 from rural area. The data survey conducted in different regions of Amravati having most popular eye hospitals are present. Every region has found the different number of patients suffering from cataract. The patients from different regions have the different numbers. The population of Amravati in 2022 was 765,000, a 1.73% increase from 2020. The sex ratio of Amravati city is 957 females per 1000 males.

To study the number of cataract surgeries in Amravati region we are collected some computerized database and some manual data from different hospitals including both urban and rural areas, and sorted out in different age groups, and gender based. A prepiloted, semi- structured interview schedule was used for seeking study-related information. The schedules were initially prepared in English and further translated into the local language Marathi, back translated and examined for consistency. The standardized questionnaire was administrated verbatim during the interview. The section of the interview schedule contained questions about the participant's sociodemographic details (age, gender, education level, occupation type of family, etc.). The second section of questionnaire sought information on participant's awareness and health- seeking practices towards cataract. The initial questions include basic assessment about awareness of cataract. All the participants were asked whether they have heard of cataract (Moti bindu) in their local language. Those who had heard of cataract were further asked in detail for their awareness about common age group in which cataract occurs, signs and symptoms of cataract and the treatment of the cataract, etc. In case the participant had never heard of cataract, the interview was closed.

Figure I. Sampling procedures in the study

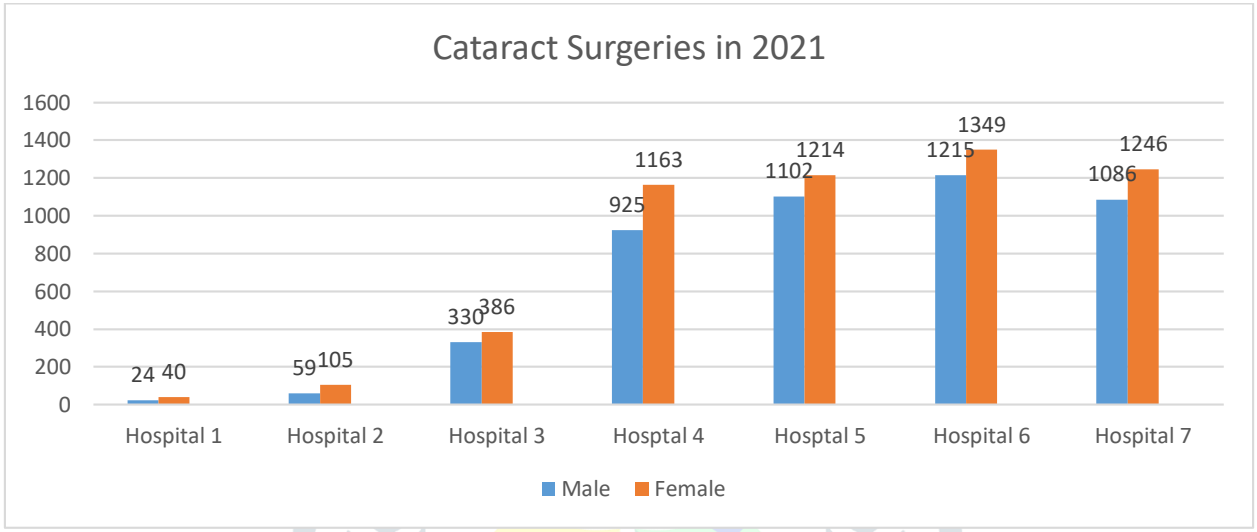


❖ Result:

The survey in the literature met the inclusion criteria (Table No.1). It includes data of 10,356 patients which was collected and analyzed according to the age groups, surgical coverage by gender ratio also on the basis of region within the one year January 2021 to December 2021. Of these patients 4747 (45.83%) were male and 5503 (53.13%) were female patients. The highest number of cataract surgeries were recorded in two age groups., (55 to 60 and 65 to 70).

In this survey, the cataract surgery coverage rates were higher for females than males. This data also indicates that the percentage of female cataract surgeries is 7.3% more than males cataract surgeries in Amravati region.

Figure II:



Notes : Orange bars represent the no. of surgeries in females and blue bars represent no. of surgeries in males.

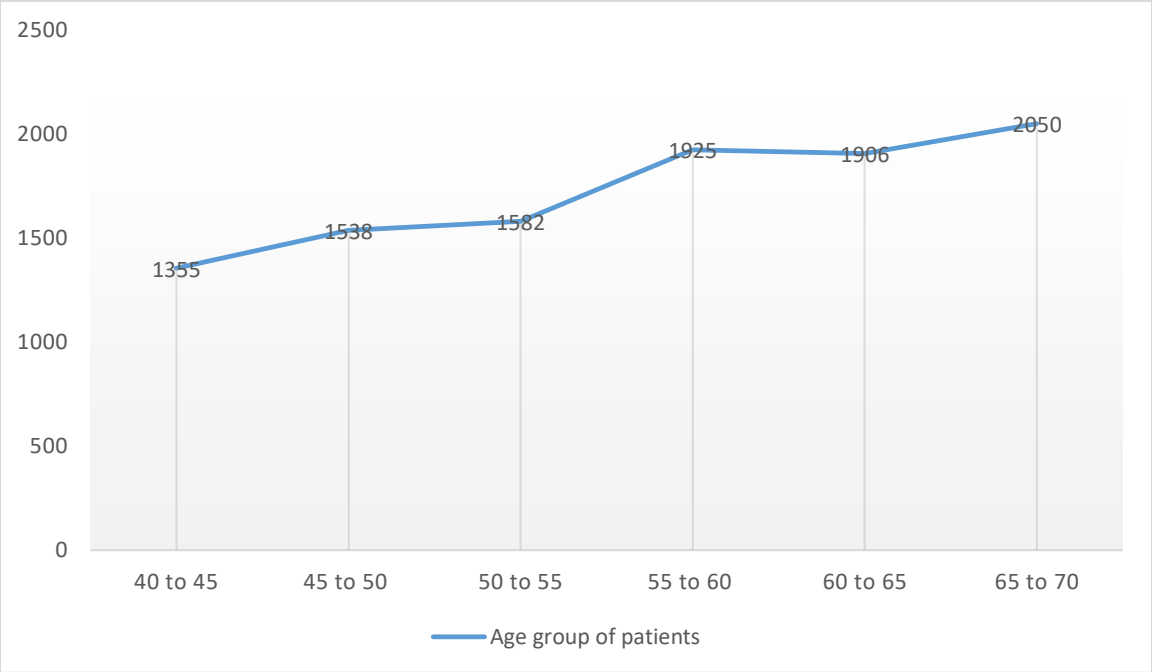
Table No. 1:

Cataract surgical coverage by age:

Sr. No.	Age Group	Total No. Of Patients	Unilateral Cataract (%)	Bilateral Cataract (%)
01.	40 to 45	1355		
02.	45 to 50	1538	63.36% (One eye cataract)	33.33% (Both eyes cataract)
03.	50 to 55	1582		
04.	55 to 60	1925		
05.	60 to 65	1906		
06	65 to 70	2050		
Total		10356	6593	3763

Notes: The data represents age groups, total no. of patients and patients having unilateral and bilateral surgeries of patients.

Figure III :



Notes: The figures shown in graph are the total no. of patients per age group. The sets are showing age groups of patients.

Discussion:

In this survey we have done field work by visiting hospitals and collected random sample data from January 01, 2021 to December 31, 2021 with the permission of authorities and having conversation with different ophthalmologists. Our findings show that a significantly higher cataract blindness burden among females. According to the previous surveys on cataract surgeries we found the same results, the illiterate is reflective of a higher incidence of cataract blindness, which in turn is the result of an increased risk of cataract development and/or a lower chance of surgery in the preblinding stages of cataract. (Without early surgery, cataract cases will ultimately reach the blindness stage, at which point they become part of the cataract blindness burden.) Because

males did not receive cataract surgery at a significantly higher rate than females, it is unlikely that earlier surgery in males is responsible for this sex related disparity in cataract blindness burden. Thus, it reasonable to suspect that the higher burden in females is due, at least in part, to a greater risk of cataract development.(A population based eye survey of older adults in Tirunelveli district of south India: blindness, cataract surgery, and visual outcomes P K Nirmalan, et al., May 01, 2002).

In this survey, the data has been categorized into six age groups and gender. Also this is a whole year data that showed in the Amravati most of ophthalmologists prefer the winter season for cataract surgeries as we found out most of cases in September to January. While having conversation with the doctors we came to know that the widely use lens in Vidarbha (including Amravati region) is monofocal lens which is costs about 25000 to 28000 INR. Figure I is about the ratio of cataract surgeries in male and female showing in both urban and rural area having more number of cataract surgeries in females. Of these patients 4747 (45.83%) were male and 5503 (53.13%) were female patients. On the basis of this findings, the percentage appear relatively low in males than females. Multivariate analysis of a cataract surgical outcome study in India also showed that women had a 2.5-fold higher risk of a poor or very poor outcome (due to surgery related causes or inadequate refractive correction) compared to men . Thus, it is possible that the sight restoration rate for women is lower than for men. In cultures in which women do not like to wear glasses, the conversion to high-quality surgery with intraocular lens may help increase uptake and outcome of cataract surgery among women. Gender and use of cataract surgical services in developing countries. (Susan Lewallen & Paul Courtright (WHO) 2002, 80 (4).

In table 1, the random samples are categories into age groups from 40 to 70 and the data showing total no. of patients in the whole year 2021. The percentage of unilateral cataract surgeries and bilateral cataract surgeries 63.36% and 33.33% respectively.

Conclusion:

As we have done a survey based study of 7 different hospitals in Amravati region having both urban and rural areas were included, we concluded that the ratio of surgeries of cataract in both region having high rate of female cataract surgeries. As per global surveys, the rate of eye related diseases such as blurry vision, cataracts are more in females than in males. According to previous surveys on cataract surgeries it may be due to the unawareness or negligence towards eye health, also in female post menopause, the level of estrogen decreases, which may be a reason of more cataract surgeries in female. Lack of awareness, socioeconomic problems are some factors combined with myths such as some people believed that they should not get a surgery done till the cataract matures, such myths affects women more than men and it is associated with cataract in villages also contribute to the risk. (Prasad Malhotra S, Kalaivani M, et al., Gender differences in blindness, cataract blindness and cataract surgical coverage in India: a systematic review and meta- analysis. British Journal of Ophthalmology June 20, 2019). In India 55% of all blindness is due to cataract. If surgery is delayed, the cataract becomes harder and difficult to remove. They can become mature and to the point of bursting inside the eye. Cataract surgery is a procedure and should be in 1 -2 years after first diagnosis. If it is delayed then the cataract can be advance and difficult to treat or remove. (Sukshma Ramkrishnan / TNN/ Oct 5, 2020 Delay in cataract surgery due to Covid-19 worsening condition of many patients). After analyzing all this thig there is need to increases the awareness in ruler and urban areas people on cataract surgery, introduce government schemes, organize free eye checkup camps through different organization.

Acknowledgment:

I express our sincere thanks to the All hospitals was providing the data for the find out the facts. I also thankful to our Head Department of Zoology Prof. Kishor Patil for their continued encouragement and support. I also express our deep sense of gratitude to Dr. V.M. Bhuse Head of chemistry Dept. Rajaram College Kolhapur and Director Prof. Anjali Deshmukh Govt. Vidarbha Institute of Science and Humanities (Autonomous), Amravati for providing us the laboratory facilities and the moral support.

References:

1.Rachael Zimlich, BSN, RN, (2022) : The Anatomy of the Lens: The lens focuses images and can be affected by cataracts and ageing.

2.Ariel M. Alperstein et al.,(2019) : studied The Amyloid found in human cataracts with two dimensional infrared spectroscopy. (PNAS Vol 116 I /no 14)

3. Vasundhara Mishra et al., (2017): Awareness and eye health -seeking practices for cataract among urban slum population of Delhi: The North India eye disease awareness study. Indian Journal of Ophthalmology.

4. Bonnie An Henderson, Kerry Solomon et al., (2014): A survey of potential and previous cataract – surgery patients: What the ophthalmologists should know. Clinical Ophthalmology 2014:8 1595-1602.

5. Ehab I Wasfi et al., (2008): Patient satisfaction with cataract surgery, International Archives of Medicine, 1186/1755-7682.

6. Paul Lee, et al., (March 01, 2007): Patients Outcomes and Cataract Surgery Volume, Volume 114,Issue 3, P403-404

7. P Raju *et al.*, (2006) : done a survey on Influence of tobacco use on cataract formation in a rural south Indian Population.

8. P K Nirmalan, *et al.*,(2002) : have done a survey on A population based eye survey of older adults in Tirunelveli district of south India: blindness, cataract surgery, and visual outcome : A systematic Meta- analysis.

9..Susan Lewallen & Paul Courtright (2002) : Gender and use of cataract surgical services in developing countries.

10. Summary by Bu *et al*., (2002) : Congenital hereditary cataracts. Int, J, Dev. Biol.48: 1031-1044(2004).

: About 387 out 467 targeted respondents participated in the study. Household heads were the majority of the respondents (246; 63.6%). Cataract prevalence amongst respondents was estimated at 44% of which 261 (67.4%) were females with 3.1% of the respondents having permanent blindness. Cataract knowledge still remains low as 228 (58.9%) and Age of respondent, gender specific, marital status, occupation, and primary care giver were significantly associated with prevalence of cataracts. Conclusions : There is an urgent need to improve eye care services so as to improve access to cataract surgery as soon as one is diagnosed. There is also need to conduct community awareness campaigns that are gender specific so as to improve community members' knowledge on cataracts and ensure they develop proactive eye services seeking behaviour. This would minimise chances of the community members suffering permanent blindness due to cataracts.