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RESEARCH ARTICLE

TO EVALUATE THE SELECTION PROTOCOL OF CATARACT PATIENTS ADMITTED THROUGH OUTREACH PROGRAMS (EYE CAMPS) UNDERGOING SURGERY IN A TERTIARY CARE CENTER OF CENTRAL INDIA

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Abstract

Aim: To evaluate the selection protocol of Cataract patients admitted through outreach programs (EYE CAMPS) undergoing surgery in a tertiary care center of Central India

Study design: It is a prospective descriptive study conducted on camp patients at a charitable tertiary eye care hospital (Central India) from January 2023 to June 2023. Written informed consent was taken from patients for participation in this study.

Setting: A prospective observational study was performed of all cataract patients admitted through outreach program (EYE Camp) for small incision cataract surgery in the department of Ophthalmology, Sri Aurobindo Institute of Medical Sciences, Indore from January 2023 to June 2023.

Material and Methods: During the study period 332 patients were screened. All patients above 40 years of age having senile cataract were included and patients with age less than 40 years of age, Congenital cataract, complicated cataracts like traumatic, uveitic, subluxated or dislocated cataracts, patients having undergone previously any ocular surgery in the selected eye, patients not giving written informed consent were excluded from the study.

Results: Out of 332 camp patients 306 (92%) patients underwent small incision cataract surgery and the surgeries of 26 patients (8%) were postponed, as the patients were unfit due to ocular and systemic reasons. Out of 26 patients, 5 patients had uncontrolled blood sugar, 7 patients had uncontrolled blood pressure, 2 patients had cardiac problems, 1 patient was asthmatic.

Conclusion: In our study, increasing age and female gender were commonly associated with cataract. Most of the patients had bilateral cataract and low vision at presentation. Hypertension and type 2 diabetes mellitus were commonly associated systemic disorders with cataract. This study highlights that high quality cataract surgery with a low intra-operative complication rate and good visual outcome can be attained even in camp patients operated in the base hospitals with standard protocols.

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Introduction:-

Cataract is the major public health problems in the context of ocular health in developing countries like India. According to the World Health Organisation (WHO), cataract is the leading cause of blindness all over the world, responsible for 47.8% of blindness and accounting for 17.7 million blind people.¹⁻² Currently, India is the second highest country next to China in contributing to the total burden of world blindness. Various modifiable risk factors associated with cataract include UV exposure, diabetes, hypertension, body mass index (BMI), drug usage, smoking and socioeconomic factors; but advancing age is the single most important risk factor for cataract and it is preventable if appropriate eye care services are provided. However, the issues and concerns of the health care planners & professionals are that a considerable proportion of these visually challenged population are concentrated in rural, underserved area where public health services are not effectively functioning. Although most cases of cataract are related to ageing process, occasionally children are born with the condition, or a cataract may develop after eye injuries, inflammation, and some other eye diseases. Cataract formation is influenced by many factors such as genetic, environmental, systemic and natural.³ Lack of proper diet, diarrhoea, dehydration, prolonged ultraviolet light exposure are some of the factors linked to cataract.⁴ Hence it is prudent to have guidelines for uniform, standardized and evidencebased care. A large number of patients who require cataract surgery could have concomitant chronic medical conditions

A comprehensive medical history and physical is currently mandated for all patients undergoing cataract surgery. One such practice is the ordering of medical testing (blood counts, serum chemistries, electro cardio grams, etc before cataract surgery.

The aim of the present study was to evaluate a quality improvement process to improve patient care and outcomes through systematic review of care against explicit criteria and the implementation of changes proportionate sample of both rural and urban population ≥ 60 years, to report the age- and gender-adjusted prevalence rates of cataract in the population and examine associated risk factors.

Material and Methods:-

A prospective observational study was performed of all cataract patients admitted through outreach program (EYE Camp) for small incision cataract surgery in the department of Ophthalmology, Sri Aurobindo institute of medical sciences, Indore from January 2023 to June 2023.

Inclusion criteria:

All patients above 40 years of age having senile cataract

Exclusion Criteria:

1. Patients with age less than 40 years of age
2. Congenital cataract.
3. Complicated cataracts like traumatic c, uveitic, subluxated or dislocated cataracts.
4. Patients having undergone previously any ocular surgery in the selected eye.
5. Patients not giving written informed consent.

A detailed history including data on demographics and ocular history were obtained from all patients at the base hospital. All the subjects underwent a detailed ophthalmic assessment including visual acuity and spectacle refraction using by snellens chart, anterior segment examination using a slit-lamp, measurement of intraocular pressure using Goldmann applanation tonometer and fundus examination using binocular indirect ophthalmoscope. Cataract were graded according to the Lens Opacities Classification System III (LOCS III) was performed by experienced ophthalmologist.⁵ After the pupils were dilated with tropicamide (1%) and phenylephrine hydrochloride (2.5%) drops, cataract grading was done on a slit-lamp while comparing it with LOCS III standard photographs. The examiner identified the specific lens opacity and assigned a severity grade. The severity of the lens opacities, according to the photographic standards, was separated into four major groups: nuclear opalescence (NO), nuclear cataract (NC), cortical (CC) and posterior subcapsular (PSC). In patients who had undergone unilateral cataract surgery or had a non-gradable lens, the LOCS III score of the fellow eye was used. Apart from this the basic systemic investigations including CBC profile, Blood sugar, Blood pressure monitoring, Echo cardiography and viral serology of all the patients were done.

The following criteria is used for systemic evaluation

1. Hypertension: Patients with a systolic BP ≥ 140 mmHg or a diastolic BP ≥ 90 mmHg or undergoing antihypertensive therapy were regarded as having hypertension.⁶
2. Diabetes patients with – fasting plasma glucose ≥ 7.0 mmol/l (126mg/dl) or 2-h plasma glucose ≥ 11.1 mmol/l (200mg/dl).⁷
3. Asthma- Inflammation and narrowing of the small airways in the lungs cause asthma symptoms, which can be any combination of cough, wheeze, shortness of breath and chest tightness.⁸
4. Cardiac diseases: Cardiovascular diseases (CVDs) are a group of disorders of the heart and blood vessels. They include: coronary heart disease, cerebrovascular disease, peripheral arterial disease, rheumatic heart disease, congenital heart disease, deep vein thrombosis and pulmonary embolism.⁹ Symptoms include sudden onset of numbness of the face, arm, or leg, especially on one side of the body; confusion, difficulty speaking or understanding speech; difficulty in seeing with one or both eyes; difficulty walking, dizziness and/or loss of balance or coordination; severe headache with no known cause; and/or fainting or unconsciousness. People experiencing these symptoms should seek medical care immediately.⁹

The proforma used for study is aligned well with the factors mentioned in guidelines of American Academy of ophthalmology

Patient ID	Age	Sex	Duration of symptoms	Pre-op BCVA Type	Grade of cataract	Advise surgery	IOP measurement	Syringing	B-scan	Axial length	Kerato metry	IOL power	Ward admission	Consent form	Systemic investigation (BP, Sugar, CBC ECG Chest X-ray, Serology)



Fig 1:-Figure showing slit lamp examination.



Fig 2:- Figure showing camp patients screening.

Result and Analysis:-

- Age distribution:** The patients ranged from 41 years to 82 years with a mean of 61.5 years. The patients were divided into four categories of 41-50, 51-60, 61-70 and above 70 years nearly 77 % patients belonged to 51-70 year age group.
- Gender distribution:** Of the total 332 patients 145 patients (43.67%) were males and 187 patients (56.32%) were females the M: F ratio was 0.76:1 showing a female preponderance in our population.
- Duration of symptoms:** Majority of patients i.e. 238 (71.66%) patients had onset of symptoms between 3 to 6 months while patients with onset of symptoms for less than 1 month were only 67
- Type of cataract:** Immature cataract was observed in 276 patients (83.13%) which was further classified into nuclear sclerosis and cortical cataract in 144 and 132 patients respectively. Only 31 patients had mature cataract and 25 patients presented with hyper mature cataract.
- Laterality of the Disease** 263 patients (83.45%) presented with cataract in both eyes followed by one eye pseudophakia in 7 patients and one eye clear lens in only 6 patients.

The involvement of eyes and severity of disease can be better understood by table no 1.

Table 1:-Table showing involvement of eyes and severity of disease.

Duration of symptoms	Severity of the disease/Diagnosis	Number of patients	Laterality
<1 month	<ul style="list-style-type: none"> Pseudophakia in one eye Immature senile cataract in other eye 	7	Unilateral (one eye)
1 to 3 months	<ul style="list-style-type: none"> Clear lens in one eye Immature senile cataract in other eye. 	6	Unilateral (one eye)
3 to 6 months	<ul style="list-style-type: none"> Immature senile cataract 	263	Bilateral (both eyes)
6 to 9 months	<ul style="list-style-type: none"> Mature or Near mature cataract 	31	Bilateral (both eyes)
> 9 months	<ul style="list-style-type: none"> Hypermature cataract Brown cataract Absolute eye 	25	Bilateral (both eyes)

6. **Systemic Co-morbidities:** 153 patients (46.08%) had systemic comorbidities, which included 63 patients (18.97%) with hypertension and 78 patients (23.49%) with Diabetes mellitus. 9 (2.7%) patients suffered from asthma and 3(0.9%) patients had history of cardiac surgery.

7. **Surgery postponed:** Out of 332 camp patients 306 (92%) patients under went small incision cataract surgery and the surgeries of 26 patients (8%) were postponed, as the patients were unfit due to ocular and systemic reasons out of 26 patients, 5 patients had uncontrolled blood sugar, 7 patients had uncontrolled blood pressure, 2 patients had cardiac problems, 1 patient was asthmatic.

Table 2:- Table showing frequent systemic diseases in cataract patients.

Number of patients	Diabetes	Hypertension	Asthma	Cardiac disease
15	5	7	2	1

9 patients had ocular comorbidities other than cataract (1 retinal detachment, 3 chronic dacrocystitis, 2 uncontrolled intraocular pressure and 3 refractive error

Table 3:- Table showing ocular co morbidities in cataract patients.

Number of patients	Retinal detachment	Chronic dacrocystitis	High intraocular pressure	Refractive error
9	1	3	2	3

The most common medical events were uncontrolled hypertension and diabetes also majority of patients had retinal and glaucoma disorders apart from cataract.

Discussion:-

Cataracts, the world's leading cause of blindness, are an enormous public health problem in developing countries like India. Identifying the risk factors responsible for cataract formation is a difficult and complicated problem because a realistic causal approach in identifying and selecting the cataract patients in the camps.

Cataract is also a hallmark of many metabolic disorders and syndromes and has been associated with many systemic diseases mainly diabetes mellitus, hypertension, obesity, asthma, cardiac diseases etc. in the current study we identify the risk factors for cataract and the association between cataract and systemic disease and also to evaluate a quality improvement process to improve patient care.

In our research maximum prevalence of cataract was seen in age groups of 51-60 years (38%) and 61-70 years (38.4%). Shori et al. also found maximum prevalence of cataract in the age group of 51-60 years (37%) followed by 61-70 year (30%), similar to our study.¹⁰ In yet another study by Mahajan et al maximum prevalence of cataract was seen in the age group of 51-60 years and 61-70 years (34.4%).¹¹ This is consistent with the fact that senile cataracts become symptomatic at these ages. Early changes of cataract are seldom noted by patients especially in rural areas like in our study.

A female preponderance is observed in our study with 56.32% patients being female. This finding corroborated to couple of other studies conducted by Shori et al and Mahajan et al where 59% and 51% patients were females respectively.¹⁰⁻¹¹ Vashist et al. also observed that prevalence of cataract was more common in females.¹² This is a promising trend as it shows the awareness amongst families and society about vision of elderly females. This can be attributed to efforts of charitable organizations by doing outreach programs and free surgeries.

In our study, bilateral involvement was noticed in majority of the patients (83.45%) similar to Mahajan et al where both eyes were involved in majority of the patients (63.12%).¹¹ In another study by Avachat et al 52.5% patients had bilateral cataract.¹³ This can be explained by the fact that senile cataract is a physiological process cataract due to trauma or any other insult of eye can lead to unilateral cataract.

In our study, maximum patients i.e. 276 patients had bilateral immature cataract showing growing awareness amongst masses or early checkup and management of cataract. The older concepts of waiting for a cataract to be fully advanced before getting operated are being busted by general awareness programs and ophthalmologists.

Mahajan et al reported Sixty percent patients had IOP between 10-15 mm of Hg in contrast to our study where 66.19.3% patients had IOP between 10-15 mm of Hg.¹⁴ In our study the population followed a gasserian curve with skew towards higher IOP in range of 10-21 mm Hg.

In patients included in our study 45.3% patients had systemic illnesses. Hypertension being most common (23.3%) followed by diabetes mellitus. These findings corroborated with Mahajan et al.¹¹ These systemic conditions are very often observed in patients of cataract in our population. Presence of Diabetes mellitus and hypertension also contribute in development of cataract. We can label these as risk factors for cataract development postoperative complications adequately, to bring about a marked improvement in the quality of visual outcome following a cataract surgery.

Tsai et al. concluded in their study that Cigarette smoking, higher systolic blood pressure and history of diabetes were the most significant risk factor for cataracts.¹⁵

Majority of our patients (71.66%) had complaints of gradual painless progressive diminution of vision since 6 months had visual acuity between 5/60 - 1/60. It signifies the fact that patients in rural areas due to their life style don't realize a diminution of vision until it reaches a significant level. Urban lifestyle and demands makes patients aware of diminution of vision earlier. Other reason for this can also be attributed to yearly camp structure by various charitable organizations. Many patients refrain from getting an early consultation and wait for camp to take place.

Conclusion:-

From this study we conclude that , preoperative facilities like blood sugar testing, sphygmomanometer and experienced physician should be available at the camp site along with ophthalmology team for better pre op evaluation of patients, also the proper instrumentation which include slit lamp, portable tonometer and facilities of syringing should be available to reduce the dropouts cataract patients in camps as postponement of cataract surgery has deleterious effect on the mental health of the patients as well. These findings are important to help implement risk factor and lifestyle-modification strategies that can hopefully decrease the burden of global cataract blindness.

Financial Support:

Nil.

Conflicts of Interest:

Nil.

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