



A REVIEW ON INTRODUCTION, ETIOPATHOGENESIS AND MANAGEMENT OF CATARACTS

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ABSTRACT

This article depicts the introduction, aetiology, pathophysiology, clinical manifestations, diagnosis and management of cataracts. This review article addresses an overview of cataracts. Normally, in cataracts patients the lens gets opacified and crystallized that causes blurred vision or decreased vision. As the person ages the lens in the eye loses its flexibility, transparency and becomes harden, as the progression of cataracts occur the lens gets cloudier and denser the large section of lens gets affected. Although aging and diabetes mellitus are most common etiological factors that triggers cataracts other factors like diseases, trauma, medications, and genetic predisposition are also associated in the formation of cataracts. The main symptoms are blurred vision, sensitivity to light and glare and in some cases there may be loss of vision in matured cataracts. Pathogenic mechanisms together with surgical procedures of cataracts extraction are also discussed.

KEY WORDS

CATARACTS, VISUAL IMPAIRMENT, BLURRED VISION. DIABETES MELLITUS , AGE, INTRA OCULAR LENS, SURGICAL PROCEDURES, LENS , OXIDATIVE STRESS.

INTRODUCTION

A cataract is a condition where the eye lens became cloudiness and causes blurred vision or double vision due to opacification or dysfunction of crystallized lens. This cataracts takes place in both senile and diabetic patients. Diabetic patients who develop cataracts are known as diabetic cataract patients. Generally, diabetic patients are at risk of getting diabetic retinopathy that is the condition where it includes the all retina problems relating to diabetes mellitus. The patients with diabetics are five times more prone to get cataracts in their early (5-10) ages of diabetes mellitus.

Cataract's is one of the main cause for the impairment of vision or causing blindness in diabetic patients in both the developed and developing countries. Cataracts of cortical and posterior subcapsular opacities are seen in diabetic patients than other non- diabetic patients.

TYPES OF CATARACTS : there are three types of cataracts namely nuclear cataracts, subcapsular cataracts and cortical cataracts.

NUCLEAR CATARACTS: The nucleus of lens becomes hard and compressed associated with yellowing of lens.

SUBCAPSULAR CATARACTS: These cataracts are granular opacities that takes place in the central posterior cortex , just below the posterior capsule. The main complaints include glare. E.g. difficulties in night driving. In this type of cataracts the patient may experience decrease in near vision than compared to distant vision.

CORTICAL CATARACTS: The cataracts that occur in the cortex region of the lens. if it involves in the visual axis then the symptoms may arise.

EPIDEMIOLOGY

Globally, worldwide 97 million people are affected with cataracts. Cataracts is the second major cause of getting blindness that affects approximately about 18 million people. According to the world health organisation cataracts are 33% responsible for all the visual impairments. As diabetic patients are growing more the chances of getting diabetic cataracts are also growing rapidly. According to centres of disease control and prevention 32.2% of adults aged 45 and above are having cataracts with diabetes. The women are more prone to get cataracts than men at a approximate proportion of 1.3 : 1.

ETIOLOGY

- Age
- Endocrine diseases (Diabetes mellitus)
- Radiation(UV rays from sun exposure and chemotherapy)
- Chemical injuries (galactose, naphthalene)
- Systemic dysfunctions
- Oxidative stress
- Primary ocular dysfunction
- Trauma
- Hereditary (congenital cataracts)
- Drugs (corticosteroids)
- Smoking
- Poor nutrition drugs

PATHOPHYSIOLOGY

- ✓ In systemic diseases(myotonic dystrophy) and endocrine disorders(diabetes mellitus) the excess glucose in the aqueous humour diffused into the lens and it causes secondary osmotic over hydration of lens. This causes opacification of crystalline lens and it forms cataracts.
- ✓ In diabetic patients there is hyperglycemia condition, in which the excess glucose is converted to sorbitol and then to fructose in general. Enzyme aldose reductase catalyzes glucose reduction to sorbitol through polyol pathway. AR pathway is the primary mediator or triggering point of diabetic cataract formation. But incase of high range of sorbitol,there will be osmotic pressure and damage occurs which further causes cataracts or other visual impairment.
- ✓ In aged people, there is accumulation of yellow brown pigment within the lens that causes a drop in light transmission and structural changes to the lens fibres that results in altered lens which maintains optical clarity.
- ✓ Due to increased radiation of light(UV /X ray) denaturation and structural abnormalities to lens crystalline proteins. It causes hardening of lens, stiffens and pigmentation of lens material this leads to cataracts formation by opacification of crystalline lens.
- ✓ In traumatic conditions , equatorial stretching and damage of capsule of lens occurs that cause opacification and cataracts formation.
- ✓ Oxidative stress is directly affecting the lens opacification. Oxidative stress is mainly caused due to the imbalance of antioxidants and pro-oxidants. Though the normal mechanisms release free radicals their destruction is imperative.
- ✓ After the cataract formation there is loss of transparency of normal lens and hardening of nucleus of central lens and therefore the symptoms may occur.

SIGNS AND SYMPTOMS

- Blurred vision / decreased vision
- Sensitivity to glare and light
- Seen halos around bright lights

- Colour vision disturbance
- Diplopia / polyopia
- Near sighted ness
- Photophobia
- Vision loss

DIAGNOSIS

- History and physical examination
- Baseline tests
- Visual acuity test – here the patients are required to read an eye chart to examine the degree of visual impairment.
- Ophthalmoscopy
- Intraocular pressure
- Retinal examination – in this test dilating drops are used to dilate eye pupil so that they can examine the retina to detect any signs of cataracts
- Biometry – for IOL implantation during surgery
- Slit lamp test – in this test light and magnification are used to access the eye structure that detects the minute abnormalities

MANAGEMENT

In Medical management , if the visual acuity is 6/24 or better then the 2.5% phenylephrine or refractive glasses are enough for daily routine and no need of surgery. Cyclopentolate and atropine are may be useful. In recent studies the researchers are developing cataracts drops that dissolves the cataracts.

No perfect medical management is there for cataracts but vitamin E (antioxidants) may be given.

If cataracts occur bilaterally, then the matured one is removed primarily through surgery

When cataracts effects the quality of patients life then the surgical management is needed. Cataract surgeries are mostly safe and effective. Surgical procedures includes extracapsular cataract extraction, intracapsular cataract extraction and phacoemulsification.

1. Extracapsular cataract extraction : In this technique removal of anterior lens capsule and cortex, leaving the posterior capsule intact. It is the most commonly used technique. In the place of patients own lens a posterior chamber IOL is implanted.
2. Intracapsular cataract extraction : here we removes the entire lens within the intact capsule. The IOL may be placed in anterior or posterior chamber or the deficit is corrected with contact lens or cataract glasses. This is old method and not in use due to its complications.
3. Phacoemulsification : It is most popular surgical procedure that involves the usage of ultrasound and softens the hardened lens, after that the cataract lens is broken off and flushed out by using special fluids and fine instruments. An IOL is implanted in the capsular bag while the posterior membrane is intact behind to hold the IOL in correct position. It usually takes about 10 – 15 minutes.
4. Another procedure under trial is laser phacolysis.

After surgical procedures, the vision of people is normal within a few days. In case of any problems related to implantation of lens then the usage of eye glasses or contact lens takes place.

COMPLICATIONS

- ✓ Photophobia
- ✓ Corneal oedema
- ✓ Corneal perforation
- ✓ Severe ocular pain
- ✓ Retinal detachment

CONCLUSION

The review article summarises an overview of cataracts. Cataracts affects the quality of patient's life. The detailed information of cataracts formation, aetiology, pathogenic mechanisms , clinical manifestations and the management of cataracts are given. The surgical removal of cataracts gives the patients lens back to normal usually within a few days and the cataracts surgeries are mostly effective and safest procedures.

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