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“CATARACT, A POTENTIAL DANGER FOR BLINDNESS”

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Abstract

Cataract is an eye disease, at the base of which is the cloudiness of the crystalline. This pathology, if not treated in time, causes blindness and is considered the main cause of blindness, especially in developed countries. The prevalence of cataract increases with the population aging. A series of co-morbidities such as diabetes, high blood pressure, glaucoma increases the risk of cataract installation, worsening the prognosis of the disease. The purpose of this study is the knowledge of the disease, symptoms, complications and the nursing care, also statistical data on cataract in Vlora district for the period march-September 2019. Nursing care is a part of treatment that has a key role in the preoperative phase and during the rehabilitation process. When people hear the word "blindness," many assume that severe vision loss is permanent and cannot be cured. In the case of blindness caused by cataracts, vision can usually be successfully restored with cataract surgery and implantation of an intraocular lens. The studies identify that great challenge is to increase the population's awareness of this serious disease, so that it can be detected and treated in time, preventing the total loss of vision.

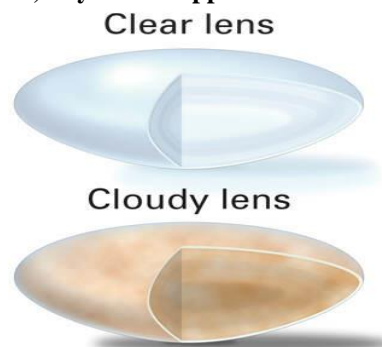
Keywords: *cataract, crystalline, blindness, treatment, etc.*

I. INTRODUCTION

Eye care is one of the greatest public health challenges of the 21st century. Of the more than 36 million people worldwide who suffer from blindness, more than half are due to cataracts. Most of these people live in low and middle-income countries, where nutrition is poor and access to eye care is limited. Many studies have shown that vision correction with cataract surgery is among the most effective interventions in health care (HCP Cure Blindness, 2015) .

Cataract occurs when the crystalline (lens of the eye) becomes cloudy. The proteins in the crystallin are damaged and cause the images that we see, to appear blurry, hazy, or less colorful.

Fig. No.1, Crystalline appearance after cataract



Source: (Talley Eye Institute, n.d.)

According to the WHO, cataracts are considered as the main causes of blindness in the world. About 51% of cases with blindness are the result of cataracts. The prevalence of cataracts is estimated at 20 million (Gross, 2018). Cataracts are very common and the most exposed category are adults and the elderly.

- In the UK age-related cataracts are thought to develop in half of patients over 65 who have eye problems. About 70% of people over 85 years old have developed senile cataract.
- In France, about 20% of individuals more than 65 are affected, with this figure rising to 60% in those older than 85.
- Australian studies have shown that the prevalence of cataracts doubles every decade after the age of 40 and that almost all individuals aged 90 years or older are affected by cataracts.
- A study conducted in India showed that the prevalence of cataracts is 3 times higher compared to the USA, where 83% of Indians aged 75-83 years are diagnosed with cataracts compared to 46% of the same age group in the USA. Statistics show that in 2020, cataract cases have doubled. The most cases are presented in developed countries, where the population continues to grow (Robertson, 2019).

- Statistics in USA according to the National Eye Institute, 24 million Americans > 40 years of age are affected by cataracts.

The prevalence by age:

- Age 40-49, 2.51 %
- Age 50-54, 5.22 %
- Age 55-59, 9.14 %
- Age 60-64, 15.45 %
- Age 65-69, 24.73 %
- Age 70-74, 36.49 %
- Age 75-79, 49.49 %
- Age 80+ , 68.3 %

According to statistics, cataracts develop more in females compared to males. NEI results show that 19.67% of cataract cases are women, while 14.26% are men (Gross, 2018).

The goal of this article is to analyze the scientific research of the disease, treatment methods and main complications and the evaluation and nursing management in cataract treatment

From this point of view, due to the importance and complications for patients, the article has several objectives:

- Firstly, to identify the age groups at risk.
- Secondly, to identify the possible risk factors
- Thirdly, to identify the possible complications
- Fourthly, to evaluate the impact that this pathology has on the patient's life

II. ETIOLOGY, RISK FACTORS, SYMPTOMS, TREATMENTS AND NURSE CARE

2.1. Etiology and risk factors

According to the study results by Mayo Clinic, most of the cataracts develop with age and as a result of damage to the tissues that make up the crystalline lens.

The risk factors are:

- d. Traumatic eye injuries or inflammations; Diabetes; Abuse with corticosteroids; Previous surgical intervention in the eye; Long exposure to sunlight; Smoking; Excessive consumption of alcohol; High blood pressure; Obesity; Family history of cataracts (Mayo Clinic, 1998-2022).
- e. Eye Diseases: Chronic anterior uveitis; Angle-closure Glaucoma; High Myopia.
- f. Systemic Diseases: Atopic Dermatitis; Myotonic Dystrophy; Neurofibromatosis type 2 (Nizami, AA; Gulani, AC;, 2022).

The aging process is the most common cause. This is due to normal eye changes that occur starting around the age of 40. This is when the normal proteins in the crystalline lens begin to break down. This is what causes it to blur. People over the age of 60 usually start to have some clouding of the crystalline lens (Boyd, 2020).

- **Diabetic cataract**

Diabetes is one of the main factors that cause the development of cataracts. Although the reasons are not cleared yet, patients with diabetes mellitus statistically have a 60% greater risk of developing cataracts. Researches have shown that people with diabetes type 2 who low their glycated hemoglobin levels by just 1%, can reduce their risk of cataracts by 19%. Also, controlling and maintaining blood sugar at normal levels helps to reduce the risk.

c. **Cataract incidence in diabetic patients**

A number of clinical studies have discovered that cataract formation occurs more frequently and happens at an earlier age in diabetic patients than in non-diabetic patients. Some studies show that cataracts are three to four times more common in diabetic patients under the age of 65. In patients over 65, cataracts are twice as common. The main risk factors are duration of diabetes and poor metabolic control. An appropriate metabolic management can prevent cataract in prediabetic patients (Kiziltoprak, H; Tekin, K; Inanc, M; Goker, YS;, 2019).

d. **Cataract with glaucoma:**

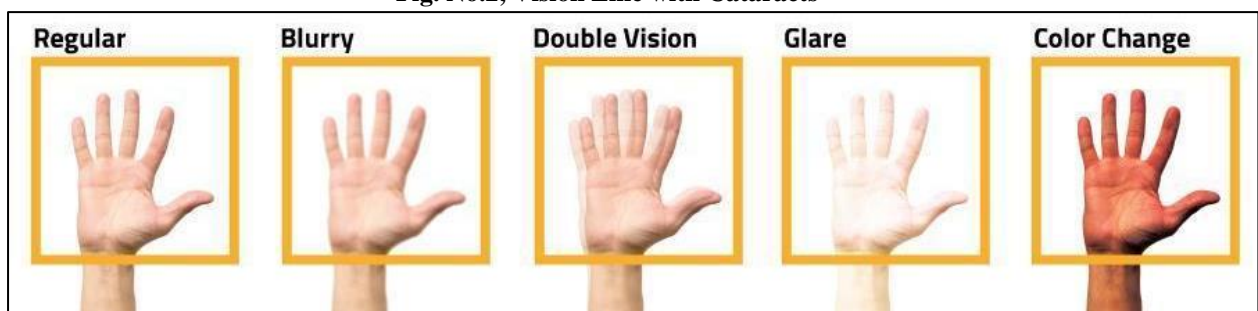
These 2 diseases often coexist at the same time in the same eye. The connection between these pathologies is two-way. From one side, glaucoma predisposes to the development of cataracts, on the other side, cataracts can cause an increase in ocular tension (secondary glaucoma) (Selfo, 2018).

2.2. The symptoms

At first, cloudiness can only affect a small part of the crystallin. Over time, as the cataract enlarges, cloudiness increases in the lens, distorting the light that passes through it. Symptoms include:

- Blurred and dim vision;
- Diplopia (double vision of an object);
- Increased sensitivity to the light, circles of light when look an object;
- Difficulty seeing at night
- Fading of color perception
- Difficulty to read, driving the car (Mayo Clinic, 1998-2022).

Fig. No.2, Vision Like with Cataracts



Source: (Southwestern Eye Center, 2018)

2.3.The treatment

2.3.1. *Surgical treatment*

Cataract treatment is only surgical. There are 2 surgical procedures for cataract removal:

c. Intracapsular cataract

This is the most common surgical procedure used to remove the cataract. It consists in removing the clouded cataract and replacing it with an artificial lens. The lens is placed in the place of the crystalline lens and stays there forever (Mayo Clinic, 1998-2022). The surgeon makes a small opening in the eye to reach the cataract. Using high-frequency sound waves (ultrasound) or a laser, the crystalline is broken into pieces. Then the doctor can remove the crystalline fragments from your eye and place a new artificial lens (Cleveland-Clinic, 2020).

d. Extracapsular cataract.

The ophthalmologist recommends this procedure in cases where intracapsular cataract is not considered an appropriate option for the patient. For example, when a cataract in an advanced stage is too thick to be fragmented. In extracapsular cataracts, a large opening is created in the eye and the cataract is removed immediately instead of being broken into pieces. Then we realize, the placement of artificial lenses (Cleveland-Clinic, 2020).

2.3.2. Drug treatment.

There is no drug treatment for cataracts, although the use of vitamin C, E and beta-carotene is being studied. Glasses or contact lenses can improve vision. Acetazolamide is administered to reduce intraocular pressure. After surgery, antibiotics (gentamicin or neomycin) are administered by drops to reduce infection, or dexamethasone to reduce inflammation. Acetaminophen is recommended when mild discomfort occurs (Rnpedia, n.d.).

2.4. Nursing care

Cataract patients should receive the usual care before undergoing eye surgery. Nurse must evaluate:

- Vital parameters;
- The patient's medical history;
- Preoperative tests;
- Recently consumed medications. Stop any anticoagulant therapy to reduce the risk of retrobulbar hemorrhage.

Nursing diagnosis:

- Anxiety related to the risk of permanent vision loss.
- Risk of trauma due to poor vision and reduced eye coordination.
- Knowledge deficits regarding ways of coping with altered abilities and regarding the manner of exposure (Belleza, 2021).

Other diagnoses in the nursing plan for cataract treatment:

- Sensory changes related to the reduction of visual acuity;
- High risk for infection;
- Lack of knowledge about diagnosis and treatment (Rnpedia, n.d.).

Pre and post operative nursing care:

- Before the operation, at dinner, the patient is given a luminal tablet, the eyelashes are cut and the operative field is cleaned;
- In the morning, the patient must perform his personal needs, then enter the operating room;
- Before the start of the operation, drops with 2% cocaine solution are administered to the patient, so that the pupil will be fully dilated (mydriatic). If the pupil is not fully dilated, the operation does not begin;
- About 2 hours before the operation, the patient is given 2fonuri tablets (to reduce the accumulation of fluids in the eye);
- Immediately before surgery, the patient is given 50 mg of pethidine and 25mg of Phenergan i/m to sedate him;
- After the operation, both eyes of the patient are bandaged and he must stay in bed, should not move and not touch the bandage.
- The food must be liquid, so that there is no excessive movement of the jaws
- The treatment is done the next day, with collar and sterile bandages. We must be careful because the wound opens easily.
- In the following days, the patient can move, but the care should not decrease (Selfo, 2018).

The purpose of nursing interventions;

- Identification of potential risk factors in the environment.
- Verification anxiety feelings and its management.
- Identification of healthy ways to express and deal with anxiety.

Some of the preventive measures that the nurse advises the patient are:

- Avoiding activities that increase intraocular pressure such as exercise.
- Encourage the patient to protect the eye from accidental damages at night by wearing a perforated plastic or metal shield, or special glasses.
- Smoking interruption because it is one of the most contributing factors in the appearance of cataracts.
- Wearing sunglasses to protect the eye from exposure to UV rays that are a predisposing factor for cataracts.
- Advise the patient to immediately report complications such as sharp pain in the eye that is not controlled by analgesics, which may cause hyphemia (a clouding in the anterior chamber of the eye) and which may signal an infection (RNspeak, 2018).

III. METHODOLOGY

For the realization of this article, several methods were used, such as the research for studies and study results of different clinics and researchers. Also, the article was made through studies of medical cards and questionnaires made in the clinic with patients. 50 patients from the clinic in Vlora were included in the study.

The questionnaire was constructed with 11 questions as below:

1. *Your age _____*
2. *Your gender? M_F_*
3. *Do you have information about cataracts? Yes_No_*
4. *Do you receive advices and information from the nursing staff about the disease? Yes_No_*
5. *Are you sick with diabetes? Yes_No_*
6. *Do you suffer from high blood pressure or take medications about HTA? Yes_No_*
7. *Have your parents been affected by cataract before? Yes_No_ Don't know*
8. *Do you have information if any of your relatives had or have cataract? Yes_No_Don't know.*
9. *Are you a consumer of alcohol? Yes_No_*
10. *Are you a regular smoker? Yes_No_*
11. *Have you been affected by other eye diseases before Yes_No_*

IV. CASE STUDY RESULTS

50 patients participated in the study. The data were obtained from a questionnaire, based on which the tables and graphs were built, also from the observation of the nursing charts. From the control of the nursing charts, it was noticed that in some cases the documentation of all nursing procedures was missing and in no case the nurses didn't create nursing diagnoses. In some of the cases, the intraocular pressure was presented in high numbers and this is a main indication for the appearance of glaucoma. The eye pressure values were not regularly in the nursing charts, which indicates that it is not regularly measured in the patient.

From the data of the study that was carried out in the Vlore Regional Hospital, in the ophthalmology department, it results that were included 50 patients. According to gender, there are 32 women, or expressed differently in percentage, they are 64%. For the male gender, the figures are 18 men or expressed as 36% of cases.

Regarding the age group, for the 10–20-year-old category there are 3 cases where 2 are male (4%) and 1 female (2%). For the age group of 20-30 years, 3 cases were recorded, where all are women (6%). For the 30-40 age group, there are a total of 4 cases, where 2 are men and 2 are women (4%). For the age group of 40-50 years there are a total of 16 cases (32%) where 10 are women (20%) and 6 are men (12%).

Regarding the age group of 50-60 years, 8 cases have been identified, where 6 are women (12%) and 2 men (4%). For the category > 65 years, there are a total of 10 women (20%) and 6 men (12%). The age group with the most cases are 40-50 years old and > 65 years old with 16 patients and with the fewest cases the age group 10-20 years old with only 3 cases.

Regarding the types of diagnosed cataracts, adult cataract dominates with 19 cases (38% of patients). Patients with senile cataracts (third age) are a total of 16 (32%). Congenital cataract is also discovered in 10 patients (20%). We also have 5 patients (10%) who have developed cataracts as a result of traumatic agents.

Tab nr. 5, Patients affected by diabetes

Patients with diabetes	Yes	No
Patients	19	31
%	38 %	62 %

Source: Questionaries 'results

In the patients with cataracts, the presence of diabetes was evidenced in 19 patients or 38% of them, while 31 patients had no signs of diabetes (62%).

Tab nr. 6. Patients with High blood pressure.

Patients with HTA	Yes	No
Patients	27	23
%	54 %	46 %

Source: Questionaries 'results

In patients with cataracts, 27 of them have arterial hypertension (54%), while 23 of them do not suffer from HTA (46%).

Tab nr. 6, Knowledge about this diagnose

If they know or not that they have cataracts?	Yes	No
Patients	17	33
%	34 %	66 %

Source: Questionaries 'results

Among the patients diagnosed with cataract, it was found that only 17 of them (34%) are aware that they suffer from this disease, while 33 patients do not know that they are affected by cataract (66%).

Tab nr.7. Evaluation whether cataracts are inherited from parents.

	Yes	No	Don't know
Patients	12	18	20
%	24 %	36 %	40 %

Source: Questionaries 'results

12 patients reported that their parents were affected by cataracts (24%), 18 patients reported that none of their parents suffered from cataracts (36%), while 20 patients (40%) did not have any information if the parents have suffered from this disease before.

Tab nr. 8. Relatives with cataract.

	Yes	No	Don't' know
Patients	16	24	10
%	31.25 %	48 %	20 %

Source: Questionaries 'results

16 patients report that their relatives suffer from cataracts or (32%). 24 patients do not refer to having any relatives diagnosed with cataracts (48%), while 10 patients (20%) do not have information about their relatives that are affected by cataracts.

Tab nr.9, Knowledge about cataract.

	Yes	No
Patients	17	33
%	34%	66%

Source: Questionaries 'results

Regarding the knowledge about cataract, 17 patients refer that they have knowledge about this disease (34%), while 33 patients do not have knowledge about cataract (66%).

Tab No.10, Advices from nurses.

	Yes	No
Patients	22	28
%	44%	56%

Source: Questionaries 'results

22 (or 44% of them) patients affirm that they receive advice and information about the disease from the nursing staff. While 28 (56%) patients say that they do not receive advice from nurses.

V. CONCLUSIONS:

Cataract is a degenerative disease that causes blindness. The most common cataract is the senile cataract (third age). Cataract etiology is multifactorial. The goal of treatment is to correct the cataract and prevent deterioration of visual sharpness.

Regarding the study that involved 50 patients, we have 32 women and 18 men. Women are more affected by cataracts than men. The most affected age groups are 40-50 years old and > 65 years old, a total of 32 cases. Some patients are diagnosed with diabetes, which is a determining factor for cataracts appearance. 27 patients are affected by HTA, which is another predisposing factor. Glaucoma appeared in 17 patients, which worsens the prognosis of the disease. 28 of the patients did not receive advices from the nursing staff. Most of the patients do not have knowledge about cataracts. Nurses have not created any nursing diagnosis.

Recommendations:

- It is recommended that nurses give advices and information as well as provide education because are very valuable in the course of treatment, as well as in preventing the state of anxiety due to the nature of the disease.

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- It is recommended that nurses do not show negligence and to document every nursing procedure.
 - It is recommended that nurses create nursing diagnosis as they are very essential in the design of care plans.
 - It is recommended to treat diseases such as diabetes, HTA as they are among the most predisposing factors for the installation of cataracts.
 - It is recommended to make at least 1-2 visits a year to the ophthalmologist to maintain the health of the eyes. It is also important because cataract has an early start.
 - Stopping smoking is recommended for individuals who have vision problems because studies have shown that smoking is an influencing factor for the appearance of cataracts.

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