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ROLE OF HIGH DIETARY SODIUM INTAKE IN DEVELOPMENT OF CATARACT IN MIDDLE AGED PEOPLE IN OPHTHALMOLOGY WARD ALLIED HOSPITAL FAISALABAD

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Abstract:
Objective: *The objectives of our study were to assess role of high dietary intake of sodium in the development of cataract in middle-aged persons.*
Study design: *We had done cross-sectional study to achieve our objectives.*
Materials and Methods: *We had taken 30 persons who had developed cataract. They were interviewed and their sodium levels in blood are checked.*
Results: *Results of our study showed the province of cataract is highest in those whose dietary sodium intake is more and have high sodium level in blood.*
Conclusion: *It was concluded from our study that low dietary sodium intake would make it possible to avoid the development of cataract in middle-aged persons.*

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INTRODUCTION:

The term cataract is derived from the Latin word, ''cataracta'' and from the Greek ''katarraktes'' which denotes a water fall. A cataract is a complete or partial opacification of sufficient severity, on or in the humen lens, to impair vision. The lens is an elegantly simple tissue. It is made up of only two fiber cells. Epithelial cells (not yet completely differentiated). Fibers cells (in which the process has been initiated or even completed) (1) Cataract is a major public health issue and many international surveys are conducted to evaluate the problem of cataract worldwide. W.H. O estimated that there are 38 million people blind in the word, half due to cataract. It is supposed that 50 million people shall be blind due to cataract by year 2020 in spite of the fact that there are 1.5 million cataract extractions performed each year in USA. (2) Pakistan is a developing country with an estimated population of 14.9 million, where prevalence of blindness is high at 1.78%. Cataract is a major cause of blindness in Pakistan. According to W.H. O statistics, approximately 605 thousand of total blindness in Pakistan is caused by cataract. The incidence of cataract is high in people above 50 with nearly 70% of them in various stages of cataract. (3) Incidence of blindness in Pakistan is growing. At present, at least 2.5 million people are officially classified as blind. More than 2/3 of these cases are caused by cataract and the country's estimated cases are about 3,50,000. (4) Cataract starts as a separation of laminated lens protein fibers appearing as water debris in eye lens. Ultimately, there is large increase in vacuole space located in the lens, taking in water and denaturing protein fibers, increasing disintegration of the cortex and classification of aqueous humor and vitrous may cause inflammation, resulting in dryness of the lens in the last stage. The disintegration caused by products escape from the lens capsule, leaving to shrunken, dried yellow/brown lens. (5)

SODIUM

It is one of most plentiful mineral in the body. About 120 grams (4oz) is in the body of adult, with 1/3 in the skeleton as in organic bone material. The remaining 2/3 is free ionized sodium, the major electrolyte in the body fluids outside the cell. Ingested sodium intake is readily absorbed from the intestine. Normally about 5% remains for elimination in feces. Larger amounts are lost in abnormal states such as diarrhea. The major route of excretion from the body is through the kidney i.e. 90%. (6)

CATARACT

Cataract is one of the major health problems. The cataract simply refers to the clouding of the lens of the eye. This lens is flexible, transparent and crucial to normal vision, located behind the pupil and the iris. Overtime certain factors cause the lens to become less transparent. When cataracts begin to develop, you might notice us light cloudiness, which makes you to want brighter light for reading, or you might have difficult driving at night because of the glair incoming head light. You might also find that bright sunlight adversely affects your vision. Cataract may develop unevenly in one eye that might be affected while other is fine, or both may be cloudy but the degree of cloudiness may differ from one eye to other. Cataract may develop very quickly or even very slowly over period of years. (7) The W.H.O and the international Agency for the prevention of Blindness have developed a global initiative for the elimination of avoidable blindness by the year 2020 under ''Vision 2020 the right to sight.'' The name is suggestive both of the goal, the prevention of avoidable vision loss and blindness by the year 2020 and the notion of good vision,2020 (6/6) vision as the target. Vision loss has identified five key areas for action, i.e. cataract, trachoma, onchocerciasis childhood blindness and refractive error and low vision. (8) On current projection there could be an estimated 50 million people blind due to cataract to increase by 2020. 1.5 million cataracts extractions are performed each year in the USA. Cataracts progressively increase with age.It is estimated that some degree of lens opacity is present in 50% of those over 60 years and 100% in those over 80 years of age worldwide.(9)

CATARACT AND SODIUM

The studies have shown that there is association between high sodium intake and cataract. A population based cross-sectional study (2,873) was conducted near Sydney, Australia, from January,1992 to January,1994, to assess the relation between the dietary sodium intake and risk of cataract. Photographs of subject, lenses were graded for cortical, nuclear and posterior sub capsular cataracts. Dietary sodium intake was assessed with a food frequency questionnaire. The study found that higher sodium intake was associated with greater risk of posterior sub capsular cataract. (10) A clear relationship also exists between high salt intake and posterior sub capsular cataract, the most serious type of cataract among older people. Australian researchers who studied nearly 3,000 people found that those who consumed more salt an average of 3,164 milligrams per day, had approximately twice the risk of this disabling condition as did with the lowest intake of salt intake an average of 1,273 milligrams per day. (11) Cataract formation is characterized chemically by a reduction in oxygen

uptake and in initial increase in water content followed by dehydration. Sodium and calcium content is increase whereas potassium, ascorbic acid and protein content is decrease. (12). The pathology of cataractous lens suggests that the cell membrane has broken, and if this is true we may expect the normal electrolyte balance with the high internal concentration of potassium and low concentration of sodium and chloride to be upset as with any other tissue, so that initially sodium will leak and potassium will leak out so long as the exchange of one for another. There will be little change in internal osmotic pressure but because the Donnan distribution imposed by a high internal concentration of negatively charged protein, ultimately the cells should swell and the final situation is that all the cells lose their membrane leading to swollen lens with low internal potassium and high internal concentration of sodium and chloride. (13)

RESEARCH METHODOLOGY:

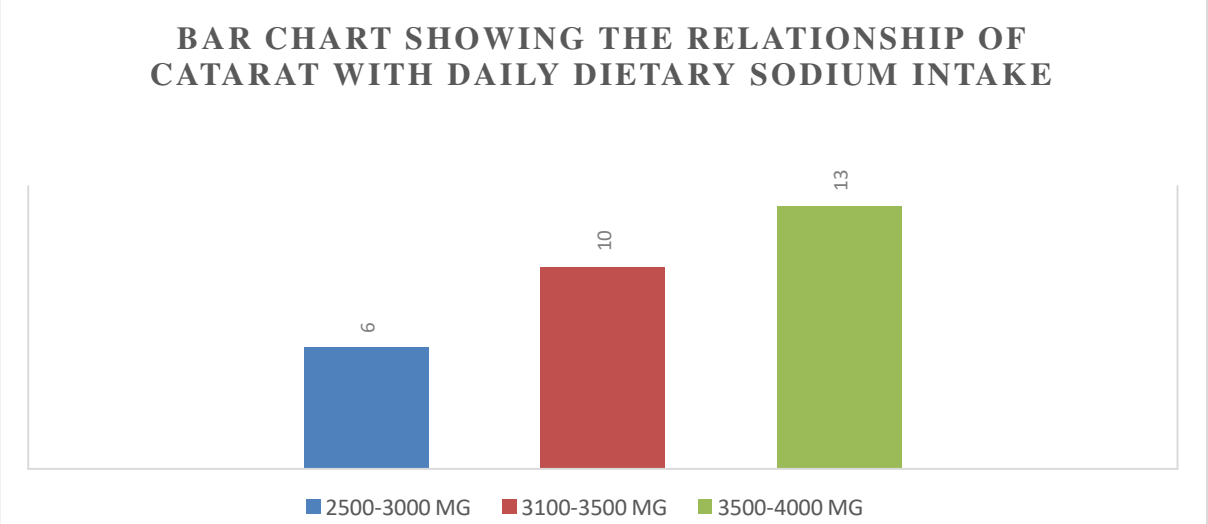
This is a cross sectional study. The research was carried out at the ophthalmology ward, Allied Hospital Faisalabad, and the duration of the study was from March 2018 to May 2018.

RESULTS:

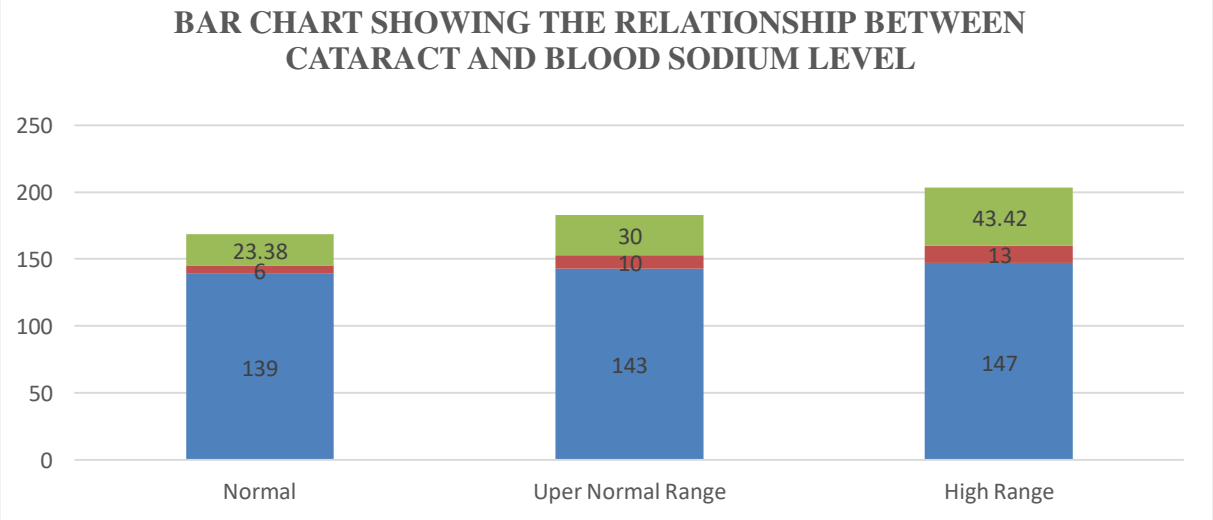
Total number of persons who had developed cataract = 30

Out of 30 persons, 6 persons had normal serum sodium level and developed cataract i-e 23-38%

Out of 30 persons,10 persons had serum sodium level in upper normal range and developed cataract i-e 30%. Out of 30 persons,13 persons had high serum sodium level above the normal and developed cataract i-e 43.42%



Daily Sodium Intake



DISCUSSION:

In our study, we have studied role of high dietary sodium intake in the development of cataract in middle-aged persons. According to our research, prevalence of cataract is high in those patients who has high sodium intake and had high serum sodium level.

CONCLUSION:

The conclusion of the study is that the prevalence of cataract is high in persons taking high sodium in diet and has high serum sodium level. According to results,13 persons are those who had highly serum sodium level and developed cataract. They were taking high dietary sodium as well. Low salt intake if less use of those would make it possible to avoid the development of cataract.

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