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Research Article

ASSESSMENT OF THE EFFICACY OF ANTIOXIDANT IN PATIENTS OF SENILE CATARACT: A CASE CONTROL STUDY

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Abstract:

Objective: To assess the relation between antioxidant vitamins “A”, “C” & “E” nutritional intake; Posterior Sub Capsular Cataracts; Nuclear and Cortical among a group of individuals both men and women.

Material and Methods: 40 patients consisting male and female age range from 40 – 79 years, with senile cataract and 26 patients having no signs of cataract, of the similar ranged ages; were preferred in the patients visited to the Ophthalmic Clinic. For grading “Nuclear, Cortical and Posterior Sub Capsular Lens Opacities (PSCLO)”; the LOCS – III “Lens-Opacities Classification System (LOCS)” was brought into practice. To review plasma absorption of Vitamin “C”; fasting blood samples were taken. We integrated food frequency questionnaires for identification of food habits of our subjects.

Results: - In cataract patients; plasma level of Vit-C 0.9 ± 0.6 mg/dl were notably P-value under 0.002 less than as compared to controlled group 1.4 ± 0.5 mg/dl. Nutritional Vit-A intake P-value under 0.04; Vit-C” P-value under 0.001 and Vit-E P-value under 0.001; in the Cataract patients; observed lower when compared with controlled group. Data shows association involving “Nuclear” P-value under 0.006, PSCO P-value under 0.01 and “Antioxidant” dietary intake, Vit-A, Vit-C and Vit-E were found within this mature patient’s group Cataract patients.

Conclusion: - In the findings of our study it is suggested that an antioxidant rich diet i.e., vitamin A, C and E may possibly carry repercussions of senile cataract formation for delay or prevention from it.

KEYWORDS: - Ophthalmic Clinic, Posterior Sub Capsular Opacities (PSCO), Senile cataract, Fasting, Plasma.

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INTRODUCTION:

In the etiology of senile cataract, we commonly believe that oxidative trauma plays key role. For last 10 years this possibility remained under consideration that antioxidant filled dietary vitamins; Vit-E and Vit-C are effective at hunting and eliminating pro-oxidants and free radicals [1,2]; possible potent for the diminishing of the cataract threat by protection of the lens proteins by the variation of the oxidative level. Enhancement of Vit-C or Vit-E trial on animal models have demonstrated that [3,4]; these can limit the damages of lens following oxidative insult and some evidences are provided by observational studies; that with more intake of such vitamins we may be able to protect individuals. LOCS-iii (Lens Opacities Classification System-iii) was exercised for assessment of PSCLO, Nuclear and Cortical; in a mature group of both the genders [5]. This study focused to examine the bond stuck between food status nutritional intake of Vit-A, Vit-C and Vit-E; and presence of Senile Cataract in the research participants [6].

MATERIAL AND METHODS:

The sample of our study comprised on 40 Patients of cataract; referred to ophthalmic clinic and sample of 26 individuals without cataract having same age \pm 2. They all underwent a test according to the LOCS-III [7]; conducted by Ophthalmologist who inquired for the past occurrence; a quantitative PSCLO appraisal was prepared, cortical and nuclear on incision light. We defined the nuclear cataract occurrence by ≥ 3 grade; cortical cataract (CC) by ≥ 2 grade; respectively at scale of nuclear opalescence [3]; on the scale of the cortical opalescence; and PSC by ≥ 0.5 grade; on the scale of Posterior Sub Capsular. Samples of 05 ml venous blood, with fasting, used at the clinic; deliberation of vitamin "C" via 02, 04

dinitro-phenyl hydrazine that is used with the combination of spectrophotometer or UV at 520nm used for measurement of plasma. Food regularity questionnaires analyzed with Nutrition-3 software to determine Vitamin A, C, and E in the diet. For the statistical analysis of data in contemporary study, we operated the SPSS. Analysis of variance, chi-square and student "t-test" have also been used in statistical data analysis.

RESULTS:

According to the results of this study, age bracket of sample population and pointing device at its baseline was in the range of 40 years – 79 years with a mean age as 64 years. In the sample of 40; males were 47.5% and females were 52.5% included in this research; and in the total of 26 Control group the proportion of male to female was respectively 38.5% and 61.5%; which were taken as sample from the patients referred to the ophthalmic clinic. Among control group when compared with case group, significant higher BMI was reported with statistically significant P-value of <0.04 , where Controls were higher in the educational level 84.6% educated and 15.4% were non-educated; when judged in the comparison of the Patients 47.5% were illiterate and 52.5% were literate.

In patients with cataract; the plasma concentration mean of vitamin C was notably $p<0.002$ lower as compared to managed group Table-1. In patients with cataract; the mean dietary vitamin A, C and E intakes were notably lower when compared with control groups Table-1. During the time span of our study, none of the sample individuals were taking any supplement.

Table – I: Characteristic of The Study Participants

| Features | Mean \pm SD | Mean \pm SD | P-value |
|--|--------------------|----------------------|---------|
| Age (yrs) | 64.4 \pm 8.4 | 63.6 \pm 6.3 | NS |
| Weight (kg) | 64.1 \pm 11.4 | 68.6 \pm 12.4 | |
| Height (cm) | 160.6 \pm 9.6 | 160 \pm 7.7 | |
| BMI (kg/ m ²) | 24.8 \pm 3.4 | 26.8 \pm 4.3 | P<0.04 |
| Education ILL. (%) | 47.5 (19) | 15.4 (4) | |
| Lit. (%) | 52.5 (21) | 84.6 (22) | |
| Plasma vitamin C (mg/ dl) | 0.9 \pm 0.6 | 1.4 \pm 0.5 | P<0.002 |
| Dietary vitamin Vit-C (mg/ day) | 100.8 \pm 75.7 | 205 \pm 174.3 | P<0.001 |
| Vit-E (mg/ day) | 1.4 \pm 1.1 | 2.9 \pm 1.3 | P<0.001 |
| Vit-A (IU/ day) | 6993.1 \pm 630.7 | 14751.6 \pm 2217.9 | P<0.04 |

As per Table-2, a degree of three types of cataract was observed in all patients, for example 25 patients of the participants 62.5% were affected by a nuclear cataract degree-III; 5 individuals 12.5% bear a cortical cataract Degree-3; and seventeen patients of our sample 42.5% were affected by a posterior sub capsular cataract Degree-3 Table-2.

Table – II: Distribution of Lens Opacity by Location

| Type/Degree | Nuclear | | Cortical | | Posterior Subcapsular | |
|-------------|---------|---------|----------|---------|-----------------------|---------|
| | Number | Percent | Number | Percent | Number | Percent |
| 0 - Trace | 4 | 10 | 11 | 27.5 | 10 | 25 |
| I | 4 | 10 | 8 | 20 | 4 | 10 |
| II | 7 | 17.5 | 13 | 32.5 | 9 | 22.5 |
| III | 25 | 62.5 | 5 | 12.5 | 17 | 42.5 |
| IV | - | - | 3 | 7.5 | - | - |
| Total | 40 | 100 | 40 | 100 | 40 | 100 |

The outcome indicated that low intake of vitamin “C”: statistically and significantly affect the nuclear cataract with a significant P-value <0.006; and PSC cataract with a significant P-value as <0.01 Table – III. Reduced Vit-E intake had a significant and statistical effect on nuclear cataract with a significant P-value as <0.001 and PSC cataract P-value < 0.01; but reduced Vit-A intake significantly effects the nuclear cataract P-value < 0.038 Table – III Vit-C concentrations.

Table – III: Correlation Coefficient for Nuclear, Cortical and Posterior Subcapsular And Dietary Intake of Vitamin C, E And A

| Type of cataract Dietary Vitamin Intake | Nuclear | | Cortical | | Posterior Subcapsular | |
|---|---------|---------|----------|---------|-----------------------|---------|
| | C.C | P-Value | C.C | P-Value | C.C | P-Value |
| Vit - C (mg/day) | -0.427 | 0.006 | 0.011 | 0.948 | 0.403 | 0.01 |
| Vit - E (mg/day) | -0.524 | 0.001 | -0.17 | 0.294 | -0.396 | 0.01 |
| Vit - A (IU/day) | -0.329 | 0.038 | 0.131 | 0.422 | -0.275 | 0.286 |

Outcomes of our research; can be compared with other case-control research studies, investigational studies carried out on various animals and three other studies of cross-sectional nature; which suggest higher threat of cataract in the individuals diagnosed with the low level of serum absorption of 2 antioxidants or more than 2 antioxidants. These results are comparable with the previous case-control studies and some previous cross-sectional studies, our study report an increase in hazards of cataract among patients with low additional ingestion of vitamin “E¹⁰”. During a regularity examination in Australia; toll of posterior sub capsular cataract and nuclear, observed higher in the individuals bearing low vitamin “E¹¹” ingestion. More consumption of vegetables and fruits in daily dietary intake may

prevent or delay senile cataract among elderly people; as these carry rich antioxidants i.e., vitamin A, C and E.

DISCUSSION:

The development mechanism of cataracts, related to age is tranquil and dubious; but lens protein damage by oxidative is alleged to participate mainly in this process [8,9,10], Lens declines the opposition with age, whereas intrinsic defense system carries this responsibility [11]. Vitamins β -carotene, C and E perform the role of antioxidants; which thus may modify the age-related development of cataracts and antioxidant defense system [12,13]. There was a statistical significant link between nuclear & posterior sub-capsular opacities, in this particular

mature participant's group, carrying little nutritional ingestion of vitamin "A", "C" and "E" [14,15]. Nuclear cataract effect on the individuals having low intake of vitamin A is significant ($p < 0.038$). Individuals having low plasma carry increased risk of nuclear cataract.

CONCLUSION:

In the etiology of senile cataract, in common, oxidative stresses is considered to play very vital and significant role. The research outcomes recommend a food carrying affluent antioxidants like vitamin A, C and E may have repercussions of prevention or delay from senile cataract formation. More consumption of vegetables and fruits in daily dietary intake may prevent or delay senile cataract among elderly people; as these are rich in antioxidant Vit-A, Vit-C and Vit-E.

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