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ORIGINAL ARTICLE

Evaluation of C-reactive protein serum levels in patients with ocular disease

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ABSTRACT:

Background: Eye diseases are known to adversely affect quality of life. In the mid-1990s, immunoassays for C-reactive protein (CRP), with greater sensitivity than those previously in routine use, revealed that increased CRP values, even within the range previously considered normal, strongly predict future coronary events. Hence; the present study was conducted for evaluating C-reactive protein serum levels in patients with ocular disease. **Materials & methods:**A total of 100 patients with presence of ocular diseases were enrolled. Another set of 100 subjects who came for routine health-check were enrolled as healthy controls. Complete demographic and clinical details of all the patients was obtained. A Performa was made and detailed clinical profile of all the patients was recorded separately. Blood samples were obtained and serum C Reactive proteins levels were evaluated. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software. **Results:**Mean age of the patients with ocular diseases and control was 41.8 years and 43.9 years respectively. Majority proportion of patients of both the study groups were males. Mean C reactive protein levels among patients of the ocular diseases and controls was 2.38 mg/L and 2.61 mg/L respectively. However; non-significant results were obtained while comparing C Reactive protein levels among both the study groups. **Conclusion:**Ocular disease didn't show any significant alteration in C Reactive protein levels.

Key words: C Reactive proteins, Ocular disease

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INTRODUCTION

Eye diseases are known to adversely affect quality of life. Geographical location, accessibility to facilities and socio- economic status of an individual play a role in occurrence eye diseases. According to international classification of diseases established by the World Health organization (WHO),[1] the vision of patients (best corrected visual acuity in the better eye) was categorized into: no visual impairment (6/6-6/18), visual impairment (<6/18-6/60), severe visual impairment (6/60-3/60), and blindness (<3/60-no perception of light).[2]The 1996 National Eye Survey showed the prevalence of visual impairment as 2.7%.[3] The Blue Mountains Eye Study (BMES) assessed the prevalence and causes of visual impairment in a representative older urban Australian population. Age-related macular degeneration (AMD) was present in 1.9% of people aged 49 years or older' and was the leading cause of blindness in this age group (corrected visual acuity less than 6/60), while cataract was the most frequent cause of mild to moderate visual impairment (best corrected visual acuity 6/12-6/60).[4]

In the mid-1990s, immunoassays for C-reactive protein (CRP), with greater sensitivity than those previously in routine use, revealed that increased CRP values, even within the range previously considered normal, strongly predict future coronary events. These findings triggered widespread interest, especially, remarkably, in the US, where the clinical use of CRP measurement had been largely ignored for about 30 years. CRP production is part of the nonspecific acute-phase response to most forms of inflammation, infection, and tissue damage and was therefore considered not to provide clinically useful information. Indeed, CRP values can never be diagnostic on their own and can only be interpreted at the bedside, in full knowledge of all other clinical and pathological results. However, they can then contribute powerfully to management, just as universal recording of the patient's temperature, an equally nonspecific parameter, is of great clinical utility.[5- 7]Hence; the present study was conducted for evaluating C-reactive protein serum levels in patients with ocular disease.

MATERIALS & METHODS

The present study was conducted for evaluating C-reactive protein serum levels in patients with ocular disease. A total of 100 patients with presence of ocular diseases were enrolled. Another set of 100 subjects who came for routine health-check were enrolled as healthy controls. Complete demographic and clinical details of all the patients was obtained. A Performa was made and detailed clinical profile of all the patients was recorded separately. Blood samples were obtained and serum C Reactive proteins levels were evaluated. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis

using SPSS software. Mann Whitney U test was used for evaluation of level of significance.

RESULTS

Mean age of the patients with ocular diseases and control was 41.8 years and 43.9 years respectively. Majority proportion of patients of both the study groups were males. Mean C reactive protein levels among patients of the ocular diseases and controls was 2.38 mg/L and 2.61 mg/L respectively. However; non-significant results were obtained while comparing C Reactive protein levels among both the study groups.

Table 1: Comparison of C reactive protein levels in ocular disease and controls

C Reactive protein levels	Ocular disease group	Control group
Mean (mg/l)	2.38	2.61
SD	0.13	0.21
p-value	0.121	

DISCUSSION

Ocular diseases such as cataracts, glaucoma and agerelated macular degeneration (AMD) are common causesof blindness, which is the second biggest fear, next todeath, among the elderly. Cataract formation representsa serious problem in the elderly and has a large impact onthe health care budget. The lens is the ocular structuremost susceptible to oxidative damage. In addition to cellular death and degeneration, when the underlying epithelial cells are exposed to the action of exogenous andendogenous reactive oxygen species, the crystallin proteins in the lens cross-link and aggregate, resulting in cataracts. Oxidative stress is a crucial factor in age-relatedprocesses including cataract formation.[8- 10]CRP, named for its capacity to precipitate the somatic C-polysaccharide of Streptococcus pneumoniae, was the first acute-phase protein to be described and is an exquisitely sensitive systemic marker of inflammation and tissue damage. The acute-phase response comprises the nonspecific physiological and biochemical responses of endothermic animals to most forms of tissue damage, infection, inflammation, and malignant neoplasia. In particular, the synthesis of a number of proteins is rapidly upregulated, principally in hepatocytes, under the control of cytokines originating at the site of pathology. Other acute-phase proteins include proteinase inhibitors and coagulation, complement, and transport proteins, but the only molecule that displays sensitivity, response speed, and dynamic range comparable to those of CRP is serum amyloid A protein (SAA).[9, 10]Hence; the present study was conducted for evaluating C-reactive protein serum levels in patients with ocular disease.

Mean age of the patients with ocular diseases and control was 41.8 years and 43.9 years respectively. Majority proportion of patients of both the study groups were males. Mean C reactive protein levels among patients of the ocular diseases and controls was 2.38 mg/L and 2.61 mg/L respectively. However; non-significant results were obtained while comparing C Reactive protein levels among both the study groups. Zaliuniene D et al determined the levels of high sensitivity C-reactive protein (hsCRP) as a systemic marker of inflammation before and after cataract surgery in patients with AMD.Three groups of patients (n=132) were studied at baseline and 8-12 weeks later: 1) a study group of patients with AMD who underwent cataract surgery (n=47), 2) a control group of patients without ocular comorbidities who underwent cataract surgery (n=36), and 3) a second control group with AMD and no surgery (n=49). Visual acuity (VA) was obtained by letter charts and expressed as decimal notations +/- SD. Contrast sensitivity was measured employing a Ginsburg Box, VSCR-CST-6500. The hsCRP was measured by means of particle enhanced immunonephelometry on a BN Systems.Postoperatively in both groups of the operated patients an improvement of VA (0.23+/-0.17 vs 0.64+/-0.25 and 0.23+/-0.18 vs 0.83+/-0.17, respectively, $p<0.0001$) and contrast sensitivity (at different spatial frequencies, from 1.5 to 18 cycles/degree, $p<0.05$) was determined. At baseline, the hsCRP level in Group 1 patients was higher than the level in controls (2.67+/-2.36 vs 1.67+/-1.36, $p<0.01$, or 1.12+/-0.99 mg/L, $p<0.0001$, respectively). After 8-12 weeks, the hsCRB level only in Group 1 significantly increased (2.67+/-2.36 vs 3.74+/-3.54 mg/L, $p<0.05$), whereas in the controls it did not change.Patients with AMD benefit from cataract surgery, both in terms of VA and contrast sensitivity.[11]It has been demonstrated that human CRP could be bound with highest affinity to phosphocholine residues, but it also binds to a variety of other autologous and extrinsic ligands, and it aggregates or precipitates the cellular and molecular structures bearing these ligands. Autologous ligands include native and modified plasma lipoproteins, damaged cell membranes, a number of different phospholipids and related compounds, small nuclear ribonucleoprotein particles, and apoptotic cells. Binding of CRP to lipids, especially lecithin (phosphatidyl choline), and to plasma lipoproteins has been documented to be the first step in generation of foam cells and atherogenesis. It has been also demonstrated that aggregated, but not native, non-aggregated, CRP selectively binds only LDL and some VLDL particles from the whole serum. Native CRP does bind to oxidized LDL and to partly degraded LDL, as found in atheromatous plaques. When aggregated or bound to macromolecular ligands, human CRP is recognized by C1q and potently activates the classical complement pathway, engaging C3, the main adhesion molecule of the complement system, and the terminal membrane attack complex, C5–C9. Bound CRP may also provide secondary binding sites for factor H and thereby

regulate alternative-pathway amplification and C5 convertases.[12- 14]

CONCLUSION

Ocular disease didn't show any significant alteration in C Reactive protein levels.

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