Research Paper

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Serum homocysteine levels in patients with retinal vein occlusion

Abstract:

Purpose: To find out role of high serum homocysteine levels in retinal vein occlusion patients at Dr. D.Y. Patil medical College.

Design: A matched case control type of study was conducted from 2016 to 2018.

Materials and Methods: Total serum homocysteine (tHcy) was measured in patients coming at Dr. D.Y. Patil medical college, aged 20 years and above. We evaluated the presence of high homocysteine levels in patients with retinal vein occlusion. We evaluated serum homocysteine levels in 50 patients with retinal vein occlusion coming to our clinic. Control subjects consisted of age and sex matched patients that were referred to our clinic for retinal disease other than vascular occlusion. homocysteine levels between 4 µmol/L to 15 µmol/L were considered normal. High homocysteine level was defined as a total serum homocysteine level above 15 µmol/L.

Results: The mean serum homocysteine level were 13.80+/-8.08 µmol/L (range, 4–33 µmol/L) for cases, and 6.43+/-1.38 µmol/L (range, 4–10 µmol/L) for controls. The mean serum homocysteine levels in cases were more than double that of controls. This difference was very highly statistically significant. Out of the 50 patients with retinal vein occlusion, 13 (26.00above normal levels as compared to the controls where none out of the 50 patients had homocysteine levels above normal. (Chi square = 14.94, d.f.=1, p¡0.001), This difference was very highly statistically significant. 38 (60cases and control groups. **C**onclusion: High homocysteine levels is a statistically significant risk factor for retinal vein occlusion and it should be evaluated in every patient with retinal vein occlusion

Introduction:

Hyperhomocystienemia is considered as increase of the homocysteine level in blood, serum or plasma. Homocysteine levels in serum between 4 to 15 micromoles/liter (µmol/L) is considered normal. Levels above 15 µmol/L is considered high. Homocysteine levels on an average are below 10 µmol/L. [2] Hyperhomocysteinemia can be moderate type, intermediate type, and severe type depending on the level of serum homocysteine: Moderate (15 to 30 µmol/L), Intermediate (30 to 100 µmol/L), Severe (greater than 100 µmol/L).1 Causes of high serum homocysteine levels can be genetic factors determinants, lifestyle (vegetarian diet, high coffee consumption), medicines (methotrexate), etc.2-5 Inadequate levels folate or of the B vitamins account for very high number of cases of hyperhomocysteinemia. [2] 6 McCully and Wilson proposed the theory of high serum homocysteine levels leading to arteriosclerosis. 7 Research relating high homocysteine levels with vascular disorders has been done extensively in the last 10 to 15 years. [1] 8,9 Increase in serum homocysteine level has been associated with myocar-

dial infarction, stroke and carotid wall thickening in adults with no history of atherosclerotic disease. Various European studies has shown that high homocysteine levels are an independent risk factor for vascular disease. [1] 9 High serum homocysteine level is a high risk factor for venous thrombosis, has been shown by many studies. [4] 10,11 A large multicentre study (The eye disease case control study group), have suggested that cardiovascular risk factors are also the risk factors for retinal vein occlusions. 12 But they did not include measurement of serum homocysteine levels in their study. Our study seeks to determine whether high serum homocysteine levels is a risk factor for retinal vein occlusion. Limited studies on this issue are available in the India. Our study estimated the role of high serum homocysteine levels in the occurrence of retinal vein occlusion. [3]

Materials and Methods:
Our study was conducted between 2016 and 2018. We took a verbal consent of the patients. The study type was a matched pair case control study. The difference in the mean levels of serum homocysteine among cases group and controls group was around 14 umol/L and this was used to calculate the sample size. [4]The standard deviation in cases group as high as 26 umol/L and in control group as high as 10 umol/L was considered. We selected 50 patients with Retinal Vein Occlusion and 50 cases without Retinal vein occlusion. This gave an 80considered 1:1 ratio of age and sex matched cases and controls. [3] Patients aged 20 years and older, diagnosed at our clinic between 2016 and 2018, and having Retinal vein occlusion in were included in cases group. Age- and sex matched patients with retinal disease without Retinal Vein Occlusion were included in the controls group. Diabetics, hyperthyroidism, patients having tobacco or tobacco related products, patients consuming alcohol, patients having undergone eye surgery in the last 1 year, pregnant women, were excluded from the study. [3] Senior ophthalmologist and ophthalmology residents undergoing training in ophthalmology were our field staff. Visual acuity for distance, and best corrected visual acuity was noted using Snellen's literate chart. [4]

Results: We tested serum homocysteine levels in 50 patients with retinal vein occlusion and 50 patients with retinal diseases without retinal vein occlusion. Table 1 shows the characteristics of cases and control group patients. The mean serum homocysteine level was 13.80+/-8.08 µmol/L (range, 4–33 µmol/L) in the cases group, and 6.43+/-1.38 µmol/L (range, 4–10 µmol/L) for control group. The mean serum homocysteine levels in cases group were more than double that of controls. This difference was very highly statistically significant. Table 2 shows the serum homocysteine levels of patients in cases and control group. Serum homocysteine levels above 15 µmol/L was considered as hyperhomocysteinemia. 13 (26.00the 50 patients with retinal vein occlusion had hyperhomocysteinemia as compared to the control group where none of the 50 patients had homocysteine levels above normal. [4](Chi square = 14.94, d.f.=1, p¡0.001). This difference was very highly statistically significant.

References

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