Original Article

The Impact Of High Homocysteine On Coronary Atherosclerosis And Hdl Function In Patients With Medium Hdl Level

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Abstract

This research paper has been elevated with the homocysteine atherosclerosis promoted through the stress-increased oxidant, impaired with an endothelial function as well as thrombosis of induction. It is also increasing the role within the HMG activity Co A reductase that can turn cholesterol increases synthesis. It is increased with the cholesterol-promoted level of atherosclerosis as well as since it is such a risk factor in CAD. the levels of serum homocysteine where it was found significantly higher in CAD and it is with than the no subjects of CAD. The high homocysteine levels have damaged the inside that increasing as well as arteries' risk of blood-forming clots. It can increase with the heart attack risk, stroke, and some other diseases of the heart as well as blood disorders vessel. High homocysteine levels can increase the blood LDL cholesterol, which can be associated with damage in arteries lining as well as atherosclerosis narrowing of arteries as well as hardening. Hcy considered concentration as a factor of risk for cardiovascular disease as well as it can be also associated with hypertension. it is such as diagnosed with invasiveness with acetylcholine testing provocation, and even it is after adjusting with the risk of cardiovascular covariables.

Keywords: Coronary, Nonobstructive, CEMD, HDL, CAD, Homocysteine, Homocysteine

1. Introduction

The high homocysteine in coronary atherosclerosis is such, a general elderly population man, which high level of homocysteine common. It is strongly associated with coronary prevalence heart disease as well as cerebrovascular disease. This is a strong predictive factor for fractal cerebrovascular disease in men and it is without hypertension but it is less so for coronary heart disease. HDL is cholesterol, and it is sometimes known as good cholesterol, it also absorbs the cholesterol in human blood as well as carried it back into the liver. It is the liver that flushes into the body. It is high levels of HDL cholesterol that lower the risk of stroke and heart disease.

2. Literature Review

Coronary endothelial dysfunction is as earliest clinically form detectable of coronary atherosclerosis. It is 60% of patients are presenting with nonobstructive and angina artery disease which is clinically indicating that coronary

angiography that has been coronary dysfunction endothelial detection with the provocation pharmacologic testing. As per the view of Ahmad et al. (2020), CMED is associated with increased mortality as well as is the highest risk of the main adverse events cardiovascular, including myocardial infarction, it is progressive heart congestive failure, as well as it is sudden death in cardiac. CEMD is a marker of early atherosclerosis, that is associated with elevated serum levels of homocysteine. It is high-normal homocysteine levels where it is associated with endothelial coronary microvascular dysfunction.

CMED is also several in vitro studies that have displayed a direct effect adverse of homocysteine on the function of endothelial, it is mainly reducing nitric oxide activities as well as it is also increasing local stress oxidative, it is also leading to endothelial dysfunction. As per the view of Bonilha et al. (2021), moreover, they hypothesize it can be elevated with the scrum and it is homocysteine of levels that can be associated with the CMED. The principal aim of the research study is to investigate the association between increased levels of homocysteine serum as well as CMED in patients with nonobstructive and angina coronary disease artery at angiography. The elevated of serum levels homocysteine, through impaired nitric oxide production, as well as coronary microvascular is associated with dysfunction with the increased risk of main events of adverse cardiovascular. Moreover, whether the serum of homocysteine levels as well as the "coronary microvascular endothelial dysfunction" that is linked with remains unknown. As per the view of Favari et al. (2020), coronary dysfunction endothelial is a systemic disease, as well as it is usually associated with elevated systemic levels of inflammatory markers such as "plasma-soluble urokinase-type plasminogen activator receptor" and also high-sensitivity protein C-reactive levels.

3. Materials and Methodology

A total of consecutive patients in 1991 with chest pain were referred for clinically coronary indicated angiography as well as functional assessment, between 1992 and 2019, who can find angiographically coronary normal arteries or CAD mild were has been enrolled with the "Mayo Clinic Endothelial Database". These patients with homocysteine serum levels that have been taken up to two weeks before coronary index angiogram which has been included in this research paper study. As per the view of Hunjadi et al. (2020), in patients with the acute coronary syndrome, cerebrovascular or myocardial infarction accident within 6 months preceding, it is also used to radiographic agents contrast within the 12 hours of catheterization, as well as chronic advanced kidney disease, and where it has been excluded. The patients fasted for the last 8 hours and all prescription medications which could affect the coronary for vasoreactivity at 48 hours before this study procedure with the calcium blockers channel, nitrates, and beta-blockers.

Functional angiography

In this research, the paper protocol has been described in previously in detail. The patients underwent coronary diagnostic angiography using the standard protocols clinically (Lv et al. 2020). Some nonobstructive CAD or no CAD and the geographic of the stenosis is less than 40% it goes on the receive 5000 units of geographic heparin, and it is after that to Doppler guidewire that has been positioned within the anterior mid-left descending artery coronary.

Clinical assessment

In clinical history, current medications and laboratory were collected from the detailed and it is chart review with an investigated to blinded angiography functional results. Data were collected on the conventional risk factors of cardiovascular factors of risk which is including age, diabetes mellitus, smoking status, hyperlipidemia as well as BMI, biochemical including parameters serum cholesterol total, LDL cholesterol, triglycerides, lipoprotein, creatinine, and the glycosylated hemoglobin.

4. Results and Discussion

The homocysteine distribution in the population was skewed with six patients having levels of less than 30 μmol/L (Park et al. 2020). CMED patients were likely to have risk cardiovascular factors such as obesity, age, male sex, or

diabetes mellitus. Moreover, they can be had to the lower smoking rate history, mildly LDL lower cholesterol levels. The serum homocysteine levels that are also CMED higher group such as compared with the microvascular normal function group "**(8 [6–10] versus 8 [6–9]; P=0.006)"**.

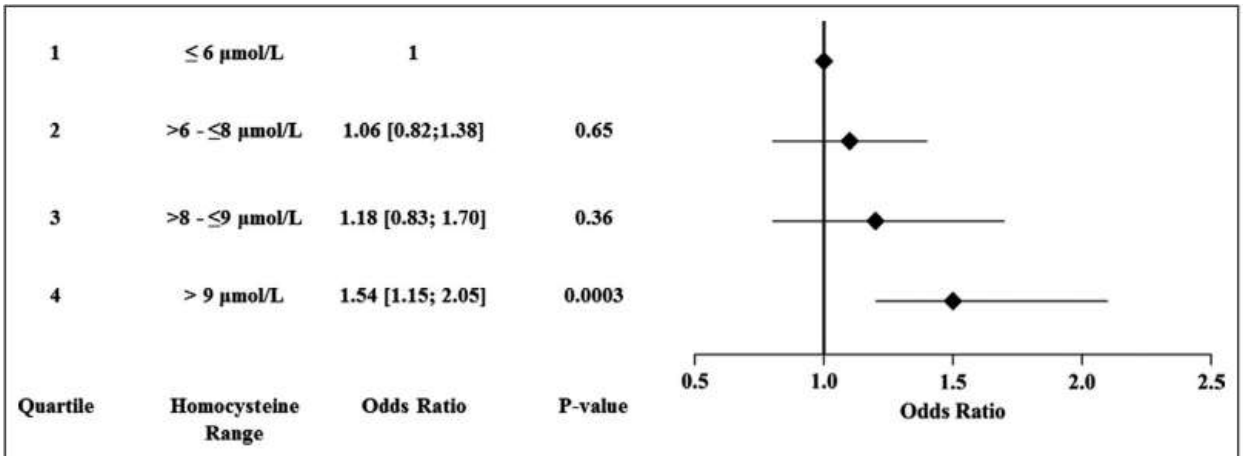

Figure 1: "Associate with the homocysteine levels and impaired with blood flow reaction to acetylcholine infusion"
(Source: Park et al. 2020)

Impact of the serum levels of Homocysteine on the coronary endothelial microvascular function
There were it is such as significant the association along quartiles,

"First quartile ≤6; second quartile >6 to ≤8; third quartile>8 to ≤9; fourth quartile >9)"

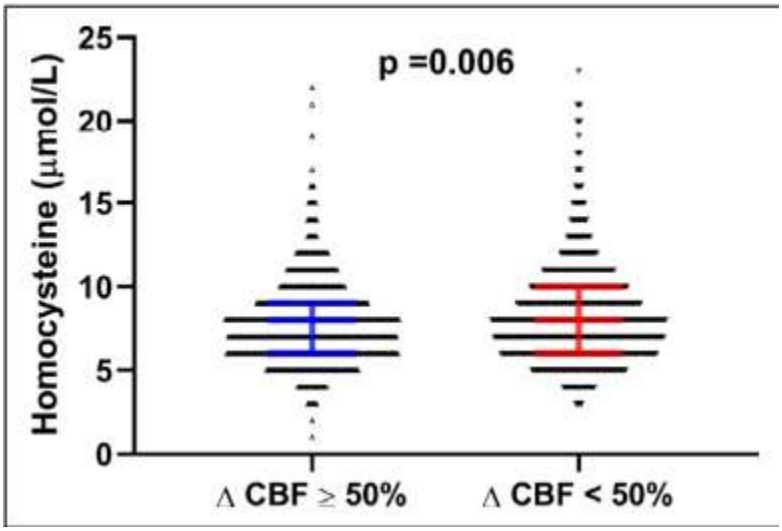

Figure 2: Difference between homocysteine levels and patients with the normal coronary
(Source: Park et al. 2019)

In homocysteine serum levels are more with hypertension, smoking exposure, and CKD. Moreover, it can be higher glycosylated levels of hemoglobin where it is on the antidiabetics and it is more with than some in quartiles (Park et al. 2019). However, it can be taken B vitamins fewer as well as more diuretics than the group with serum levels homocysteine <9. Univariable regression analysis showed which levels of homocysteine in the highest quartile where can be significantly associated with the CMED.

5. Recommendation

In this research paper study, it can be demonstrated the elevated of serum levels homocysteine in patients with early coronary atherosclerosis are associated with endothelial dysfunction. In present study supports further a homocysteine role in the mechanism, as well as potentially with a target of therapeutic, in coronary early atherosclerosis in humans (Werida et al. 2021). It is interestingly, the association along elevated serum levels of homocysteine as well as seemed CMED to augmented in the patients on the B-vitamin of supplementation if this association is not statistical with various patients on a diuretic or statin therapy such as compared to some who are not.

6. Conclusion and Future Scope

In current study has been demonstrating with early atherosclerosis coronary which is associated with elevated levels of homocysteine as well as even high-normal homocysteine levels and is highest quartile is > 9 μmol/L and these are weakly independently significantly weakly associated with diagnosed CMED invasively with the pharmacologic provocation in testing. Hence, it is a link to increased levels of homocysteine as well as adverse cardiovascular can events potentially to be mediated by the coronary dysfunction endothelial. Moreover, it is no causal link that has been established, to require further investigation. This study has several limitations, where first it is retrospective as well as cross-sectional which can be made designed with the challenge derive the associations causal, and these results are considered as generating the hypothesis. Moreover, it is with the knowledge that can be a cohort that is the biggest database of the undergoing patients an assessment invasive of an endothelial of function. Moreover, it is some variables where it is not to be taken the account into during the clinical assessment.

Reference List

1. Ahmad, A., Corban, M.T., Toya, T., Sara, J.D., Lerman, B., Park, J.Y., Lerman, L.O. and Lerman, A., 2020. Coronary microvascular endothelial dysfunction in patients with angina and nonobstructive coronary artery disease is associated with elevated serum homocysteine levels. Journal of the American Heart Association, 9(19), p.e017746.
2. Bonilha, I., Zimetti, F., Zanotti, I., Papotti, B. and Sposito, A.C., 2021. Dysfunctional high-density lipoproteins in type 2 diabetes mellitus: molecular mechanisms and therapeutic implications. Journal of Clinical Medicine, 10(11), p.2233.
3. Favari, E., Angelino, D., Cipollari, E., Adorni, M.P., Zimetti, F., Bernini, F., Ronda, N. and Pellegrini, N., 2020. Functional pasta consumption in healthy volunteers modulates ABCG1-mediated cholesterol efflux capacity of HDL. Nutrition, Metabolism and Cardiovascular Diseases, 30(10), pp.1768-1776.
4. Hunjadi, M., Lamina, C., Kahler, P., Bernscherer, T., Viikari, J., Lehtimäki, T., Kähönen, M., Hurme, M., Juonala, M., Taittonen, L. and Laitinen, T., 2020. HDL cholesterol efflux capacity is inversely associated with subclinical cardiovascular risk markers in young adults: The cardiovascular risk in Young Finns study. Scientific reports, 10(1), pp.1-12.
5. Lv, P., Zheng, Y., Huang, J., Ke, J. and Zhang, H., 2020. Association of apolipoprotein E gene polymorphism with ischemic stroke in coronary heart disease patients treated with medium-intensity statins. Neuropsychiatric Disease and Treatment, pp.2459-2466.
6. Park, H.S., Kim, I.J., Kim, E.G., Ryu, C.S., Lee, J.Y., Ko, E.J., Park, H.W., Sung, J.H. and Kim, N.K., 2020. A study of associations between CUBN, HNF1A, and LIPC gene polymorphisms and coronary artery disease. Scientific Reports, 10(1), pp.1-10.
7. Rahimi, P., Mesbah-Namin, S.A., Ostadrahimi, A., Abedimanesh, S., Separham, A. and Jafarabadi, M.A., 2019. Effects of betalains on atherogenic risk factors in patients with atherosclerotic cardiovascular disease. Food & function, 10(12), pp.8286-8297.
8. Werida, R.H., Omran, A. and El-Khodary, N.M., 2021. Sortilin and homocysteine as potential biomarkers for coronary artery diseases. International Journal of General Medicine, pp.6167-6176.