Study the effect of folic acid and homocyssteine precursor on isoprenaline induced myocardial infarction

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Atherosclerosis has been an important cause of cardiovascular morbidity and mortality in recent years.Over the last twenty years, homocysteine has taken an increasing importance as an independent risk factor for various forms of vascular disease. The influence of hyperhomocysteinemia on vascular biology has been studied in different experimental animal models, but its effect on the development of atherosclerosis has not been reported until recently. The essential amino acid, methionine plays as important role in generating homocysteine by demethylation.Folic acid is a very important cofactor in the metabolism of methionine and homocysteine, and constitutes the major determinant of plasma total homocysteine level.This study was carried out in order to investigate the role of folic acid in the protection against isoprenaline induced myocardial injury and its relation to hyperhomocysteinemia.This study was carried on 5 main groups of adult male albino rats. The first of them is the control group received no medications. The 2nd group injected with isoprenaline in a dose of 75mg/kgm intraperitoneal for induction of ischemia. The 3rd group received methionine at a dose of 0.5gm/kgm/day in the drinking water for one week before isoprenaline injection. The 4th group received folic acid orally in two different doses 2mg, 5mg/kgm/day for one week before isoprenaline injection. The 5th group received folic acid orally in two different doses 2mg, 5mg/kgm/day with methionine 0.5gm/kgm/day or one week before isoprenaline injection.The parameters used to evaluate haemostasis were bleeding time and clotting time and those used to evaluate myocardial infarction were serum CK-MB, T-wave voltage, T-wave area and infarction size.The E.C.G. was recorded 5,15,30,60,120 minutes after isoprenaline injection while, the serum CK-MB and infarction size were estimated 2 hours after isoprenaline injection.The obtained results of this study could be summarized as follow:• Isoprenaline injection resulted in myocardial infarction manifested by significant increase in CK-MB, T-wave voltage, T-wave area and an infarction of the left ventricle which had a mean value of 28% □ 5.2 while there was no significant change in bleeding time and clotting time as compared with the control group.• Methionine intake before isoprenaline injection significantly decreases bleeding time and clotting time and significantly increases CK-MB, T-wave voltage, T-wave area and infarction size as compared with isoprenaline injected group.• Folic acid intake in its 2 doses 2mg, 5mg/kgm/day before isoprenaline injection significantly

increases bleeding time and clotting time and this effect is not dose dependent and significantly decreases CK-MB, T-wave voltage, T- wave area and infarction size when compared with isoprenaline injected group and this effect is dose dependent.• When folic acid by its 2 doses 2mg, 5mg/kgm/day is taken with methionine before isoprenaline injection, there is significant increase in bleeding time and clotting time and significant decrease in CK-MB, T-wave voltage, T- wave area and infarction size as compared with methionine group and this effect was dose dependent meaning that by increasing the dose of folic acid from 2mg to 5mg, there is more protective effect against myocardial infarction.from the above results we conclude that high dietary methionine is a risk factor for atherosclerosis and that folic acid is protective against atherosclerotic vascular disease, an effect which is independent on its role on methionine and homocysteine metabolism.RECOMMENDATIONS• Further investigations are needed to find out the dose dependent effect of methionine intake.• Further studies on the effect of folic acid in experimental animal models to evaluate its role in the protection against atherosclerosis and as the experimental trials are more controlled than human cases.• Also more studies are needed elucidate other mechanisms of action of the direct protective effect of folic acid supplementation and to adjust the effective dose of folic acid.