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Erectile dysfunction drugs induced-changes in levels of homocysteine as risk factor of cardiovascular diseases

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It is believed that hyperhomocysteinemia is an independent risk factor for premature atherosclerosis, venous thrombosis and other cardiovascular diseases (CVD) in both man and women. Also, a strong relationship between plasma homocysteine levels and mortality has been reported in patients with CVD. In addition, oxidative stress has long been regarded as a key pathophysiological mediator that ultimately leads to CVD including atherosclerosis, hypertension and heart failure. It is well known that oxidative stress is alleviated by antioxidant enzymes such as superoxide dismutase (SOD) and catalase activities (CAT). Therefore, the present study aimed at investigating the level of homocysteine after treatment of male rats with a daily dose of sildenafil citrate (viagra) [1.48 mg/kg], vardenafil (levitra) [0.285 mg/kg], and tadalafil (cialis) [0.285 mg/kg body weight] for three weeks. In addition, the levels of high- and low-density lipoproteins [HDL, LDL], total cholesterol, triglycerides and activities of SOD and CAT were also determined. The level of homocysteine was increased by 67% and 93% in plasma of both levitra and viagra-treated rats respectively, whereas cialis did not change such level. Also, levitra and viagra increased SOD activity by 46% and 35% respectively. In addition, levitra, viagra and cialis increased the activity of CAT by 50%, 33% and 43% respectively. The level of total cholesterol did not change after treatment of rats with any of the tested compounds. On the other hand, levitra, viagra and cialis increased levels of HDL by 41%, 25%, and 25% respectively. On the other hand, triglyceride level (TG) after treatment of rats with viagra. It is concluded from this study that erectile dysfunction (ED) drugs (levitra and viagra) induced the level of homocysteine and antioxidant enzymes activities. The present study provides another new possible mechanism, in addition to their inhibitory effects on phosphodiesterase type 5, through induction of antioxidant enzymes (SOD & CAT) since most cases of erectile dysfunction (ED) are associated with high oxidative stress levels which could be alleviated by these enzymes. Also, it seems that tadalafil is safer than the other two drugs because it did not change the level of homocysteine. Moreover, patients who are using sildenafil or vardenafil should be advised to take vitamin B_{12}, pyridoxal-5-phosphate, and folic acid in order to reduce the level of homocysteine since these vitamins play an important role in biotransformation of homocysteine into methionine which can be used in protein synthesis.

Biography

Sheweita S. A. has completed his Ph.D. from Alexandria University and California University, Davis as joint supervision and postdoctoral studies from Manchester University. He is the Head of Biotechnology Department, Institute of Graduate Studies and Research, Alexandria University, Egypt. He has published more than 40 papers in reputed journals and has been serving as an editorial board member of African Journal of Biochemistry Research.

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