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Effects of nicotine and folate on the level of plasma homocysteine in rats

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Homocysteine is a sulfur amino-acid produced during the metabolism of the essential amino acid methionine. Moderately increased plasma total homocysteine concentration have been implicated as a risk factor for occlusive vascular disease. Smoking is known to be one of the most significant factors leading to elevated plasma homocysteine concentration. However, the main component of a cigarette, nicotine has been not studied whether it is linked directly to the increase of homocysteine concentration in blood. The metabolism of homocysteine is closely linked to that of its cofactors, folate. Here, the effects of nicotine and folic acid on amount of plasma homocysteine were studied. The concentration of homocysteine was increased by 72% in rat plasma after nicotine treatment for one month. This increased concentration of homocysteine was reduced by 60% at 6 hours later after folate treatment. Thus, nicotine should be directly involved in increasing the concentration of plasma homocysteine. Also as shown in other studies, it was observed that folate lead to the decrease of homocysteine concentration in rat plasma.

Keyword : Homocysteine, Nicotine, Folate