The administration of folic acid improves erectile function and reduces intracavernosal oxidative stress in the diabetic rabbit.

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OBJECTIVE: To test the possibility that folic acid (FA) may be a means of treating erectile dysfunction (ED) in diabetes mellitus (DM), by studying the effect of FA administration to DM rabbits on cavernosal function and intrapenile oxidative stress.

MATERIALS AND METHODS: To investigate the effect of administering FA to DM rabbits on erectile function and oxidative stress the formation of superoxide (O(2)(-)), 8-isoprostane F(2 alpha) (8-IPF(2 alpha)) and prostacyclin (as 6-keto-PGF(1 alpha)) were assessed, as well as carbachol- and electrical field stimulated (EFS) relaxation and p47(phox) content (active component of NADPH oxidase complex). Non-ketotic DM was induced in New Zealand rabbits with alloxan and FA administered orally daily for 1 month. Rabbits were killed, penises excised and segments prepared. These were mounted in an organ bath and relaxation elicited with carbachol or EFS. O(2)(-)-release was measured spectrophotometrically, p47(phox) expression by Western blotting and 8-IPF(2 alpha) and 6-keto-PGF(1 alpha) formation by enzyme-linked immunosorbant assay. Blood was collected for measurement of homocysteine, red blood cell (RBC) folate and glucose.

RESULTS: In cavernosal tissue from DM rabbits, carbachol-and EFS-induced relaxation was significantly impaired compared with the untreated controls. O(2)(-)-release, p47(phox) expression and 8-IPF(2 alpha) formation were all enhanced and 6-keto-PGF(1 alpha) formation reduced compared with the controls. All these effects were reversed by FA. Plasma total homocysteine was reduced and RBC folate elevated.

CONCLUSIONS: The administration of FA may constitute a strategy for reducing ED in patients with DM.

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