

Curcumin arrests endometriosis by downregulation of matrix metalloproteinase-9 activity.

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Abstract

Curcumin, a polyphenol derived from turmeric (*Curcuma longa*) possesses diverse pharmacological properties including antioxidant, anti-inflammatory and antiproliferative activities. Endometriosis is a gynecological disorder characterized by growth of endometrial tissues outside uterus that involves aberrant matrix remodeling. In this study the effect of curcumin was studied on surgically developed endometriosis in mice. Endometriosis with varying severity was developed in mice by peritoneal implantation of uterine fragments. The changes in matrix metalloproteinase (MMP)-9 and tissue inhibitor of metalloprotease (TIMP)-1 were investigated in endometriotic tissues following curcumin pre- and posttreatment. Results showed that MMP-9 activity increased gradually in endometriotic tissues with severity and curcumin treatment reversed the MMP-9 activity near to control value. Curcumin administered either post- or pre-endometriosis arrested endometriosis in a dose-dependent manner. It inhibited both MMP-9 activity and its expression at the level of secretion, during regression of endometriotic lesion. In addition, the attenuated activity of MMP-9 was associated with decreased expression of tumor necrosis factor-alpha (TNF-alpha) during healing, suggesting the anti-inflammatory property of curcumin. Moreover, curcumin pretreatment prevented lipid peroxidation and protein oxidation in endometriotic tissues. We reported here for the first time the anti-endometriotic property of curcumin via MMP-9 dependent pathway that may lead to new therapeutic intervention.