Abstract

Endometriosis is an estrogen-linked gynecological disease defined by the presence of endometrial tissue on extrauterine sites where it forms invasive lesions. Alterations in estrogen-mediated cellular signaling seems to have an essential role in the pathogenesis of endometriosis. Higher estrogen receptor (ER)-β levels and enhanced ER-β activity were detected in endometriotic tissues. It is well known that ER-β interacts with components of the cytoplasmic inflammasome-3 (NALP-3), the NALP-3 activation increases interleukin (IL)-1β and IL-18, enhancing cellular adhesion and proliferation. Otherwise, the inhibition of ER-β activity suppresses the ectopic lesions growth. The present study aims to investigate the potential effect of α-lipoic acid (ALA) on NALP-3 and ER-β expression using a western blot analysis, NALP-3-induced cytokines production by ELISA, migration and invasion of immortalized epithelial (12Z) and stromal endometriotic cells (22B) using a 3D culture invasion assay, and matrix-metalloprotease (MMPs) activity using gelatin zymography. ALA significantly reduces ER-β, NALP-3 protein expression/activity and the secretion of IL-1β and IL-18 in both 12Z and 22B cells. ALA treatment reduces cellular adhesion and invasion via a lower expression of adhesion molecules and MMPs activities. These results provide convincing evidence that ALA might inhibit endometriosis.