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Exploring the role of L-tartaric acid in ovarian cancer: Pyroptosis and inflammation as key targets

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Ovarian cancer is one of the most lethal gynecological malignancies, and treatment options for it are limited. L-tartaric acid, an organic compound from natural resources, especially grapes, has shown potential anticancer properties but remains underexplored in ovarian carcinoma. The present study was designed to investigate its effects on A2780 ovarian cancer cells, with a focus on cell cycle control, pyroptosis, autophagy, and inflammation. Cells were treated with different concentrations of L-tartaric acid, and viability was assessed using MTT assays. Expressions of *CCND1*, *CCNE1*, *GSDMD*, *GSDME*, *MAP1LC3B*, *ATG5*, *IL1B*, and *IL6* were determined by RT-qPCR, while IL-1β and IL-6 protein levels were measured using ELISA. L-tartaric acid significantly reduced cell viability ($P< 0.05$) and downregulated *CCND1* and *CCNE1*, indicating G1 phase arrest. *GSDMD* and *GSDME* expression, as well as IL-1β and IL-6 secretion, were also decreased, whereas autophagy-related genes (*MAP1LC3B*, *ATG5*) remained unchanged. These findings raise the possibility that L-tartaric acid may exhibit cytostatic and anti-inflammatory activities against ovarian carcinoma cells, likely by inhibition of pyroptosis-involved inflammatory pathways. The findings support further investigation of L-tartaric acid as a candidate compound for ovarian cancer therapy.

Keywords: L-Tartaric acid, Ovarian cancer, Pyroptosis, Cell cycle arrest, Inflammation