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NATURAL ANTIOXIDANTS IN THE FIGHT AGAINST OVARIAN CANCER: IN VITRO EFFECTS OF POLYPHENOLS

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Ovarian cancer is among the most lethal gynecological malignancies, mainly due to late diagnosis and the development of chemoresistance. The search for new therapeutic strategies has led to a growing interest in natural compounds with antioxidant and anticancer properties. Among these, ellagic acid (EA), a polyphenol found in pomegranates and berries, and curcumin (CUR), the main component of turmeric, have gained attention for their anti-inflammatory, antioxidant, and antiproliferative effects. However, limited data are available on their activity in ovarian cancer cells. This study investigates the in vitro antiproliferative and cytotoxic effects of EA and CUR on IGROV-1 human ovarian cancer cells, as well as their ability to modulate cellular oxidative status. To assess the biological response to antioxidants, cells were exposed to CUR [8 µM; 16 µM], and EA [18 µM; 36 µM], for 24 h, 48 h, and 72 h. Proliferation, viability, and NBT assays to detect ROS were performed. Based on results showing greater efficacy at higher concentrations, TUNEL and Wound Healing assays were conducted to evaluate apoptosis and cell migration, limited to the highest concentrations. Both compounds inhibited proliferation and reduced viability, TUNEL results confirmed increased apoptosis, while Wound Healing showed a significant reduction in migratory capacity. Therefore, treatment with CUR and EA modulated the cellular oxidative status, by a reduction in ROS levels compared to controls. In addition, an increase in apoptosis has been detected, suggesting the involvement of redox regulation and related signaling pathways. This is also reflected in reduced viability, proliferation, and migratory capacity. Overall, the data confirm the antitumor potential of EA and CUR in IGROV-1 cells, highlighting differences in response between the two compounds, suggesting distinct but complementary mechanisms of action. Looking ahead, the use of polyphenols could represent a supportive approach worth exploring, with potential positive implications for protecting ovarian function and fertility in cancer patients.