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Caffeic acid protects human trophoblast HTR-8/SVneo cells from H<sub>2</sub>O<sub>2</sub>-induced oxidative stress and genotoxicity.

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Caffeic acid is highlighted as one of the major phenolic compounds present in foods with known antioxidant activity. This phenolic is among commonly consumed substances in everyday diet of pregnant women. However, there is not enough information on its effects during pregnancy, especially the most vulnerable early stage. Extravillous trophoblast cells are specific cells of the placenta that come in direct contact with maternal uterine tissue. Through this study we investigated the cytoprotective effects of caffeic acid on H<sub>2</sub>O<sub>2</sub>-induced oxidative damage in first trimester extravillous trophoblast cell line HTR-8/SVneo. Investigated concentrations (1-100 µM) of caffeic acid showed neither cytotoxic nor genotoxic effects on HTR-8/SVneo cells. The treatment with caffeic acid 100 µM significantly increased the percentage of cells in G2/M phase of the cell cycle, compared to non-treated cells. Pretreatment with caffeic acid (10 and 100 µM) attenuated oxidative DNA damage significantly, reduced cytotoxicity, protein and lipid peroxidation, and restored antioxidant capacity in trophoblast cells following H<sub>2</sub>O<sub>2</sub> exposure. This beneficial outcome is probably mediated by the augmentation of GSH and effective ROS scavenging by caffeic acid. These promising results require further investigations to reveal the additional mechanisms/pathways and confirmation through studies in vivo.