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Modulation by hydroxytyrosol of oxidative stress and antitumor activities of paclitaxel in breast cancer.

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Abstract

PURPOSE: The main objective of this study was to test the therapeutic potential of **hydroxytyrosol** and its combination with paclitaxel in breast **cancer** on oxidative stress status.

METHODS: Impact on proliferation rates of different chemotherapy administration patterns was assayed in MCF-7 and MDA-MB-231 breast **cancer** cell lines. Breast tumor-bearing rats were randomly assigned to Control, **Hydroxytyrosol**, Paclitaxel and Paclitaxel plus **hydroxytyrosol** groups, for 6 weeks. Tumor volume, cell proliferation and several systemic oxidative stress parameters were measured. Anti-proliferative activity in vitro experiments was correlated with in vivo experiments.

RESULTS: Combination group did significantly reduce tumor volume when compared with paclitaxel alone. Additionally, the combination improved the antioxidant status without compromising the antitumor activity of standard chemotherapy.

CONCLUSION: These findings reveal for the first time that **hydroxytyrosol** is an active partner in combined therapies with paclitaxel against breast **cancer**. Combination with **hydroxytyrosol** would also ensure a less oxidative impact of chemotherapeutic drugs that could potentially improve patient wellness.

KEYWORDS: Breast **cancer**; Cell proliferation; **Hydroxytyrosol**; Multimodal treatment and paclitaxel; Oxidative stress

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