Chemopreventive Potential of Alpha-Santalol in a Mouse Model of Prostate Cancer

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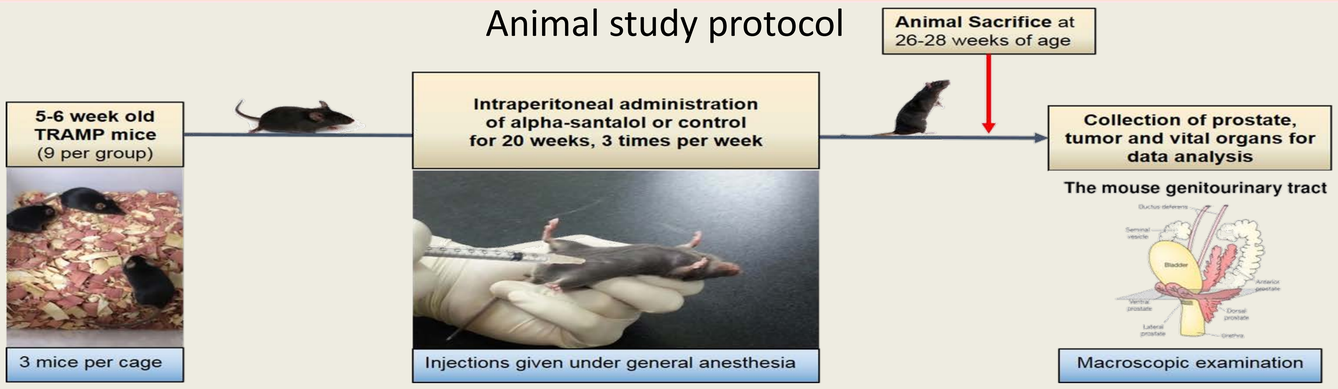
ABSTRACT

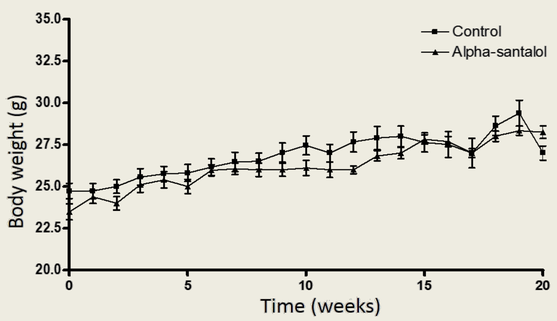
Alpha-santalol, a major component of sandalwood oil inhibits growth of cultured prostate cancer cells *in vitro* by causing apoptosis. The present study was undertaken to determine the *in vivo* efficacy of α-santalol using TRAMP (Transgenic Adenocarcinoma of Mouse Prostate) mice as a model. Administration of α-santalol (100 mg/kg) significantly decreased the incidence of prostate tumors, average wet weights of urogenital organs and prostate weight compared to control mice. Furthermore, the dorsolateral sections of prostate from α-santalol-treated mice exhibited decreased cell proliferation (Ki-67 staining) in association with induction of apoptosis (TUNEL-positive cells). In agreement with immunohistochemical analysis, Western blotting analysis of prostate/tumor samples from α-santalol-treated group revealed a decrease in survivin, XIAP, PCNA, cyclin D and CDC2 levels compared to control samples. c-RAF, a proto-oncogene was also downregulated in alpha-santalol treated group compared to the control group. In conclusion, the present study indicates that α-santalol administration inhibits the development of prostate cancer in TRAMP mice by decreasing cell proliferation, and inducing apoptosis and warrants future studies for its clinical development. This study was supported by Wilkes University's Provost Research grant and mentoring grant.

RESULTS

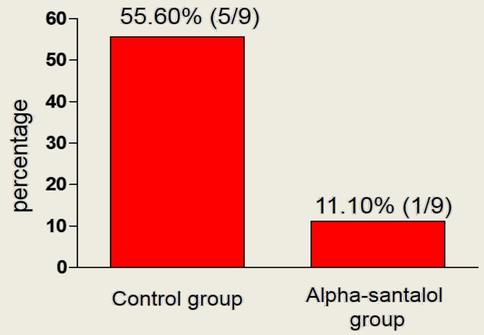
Animal study protocol



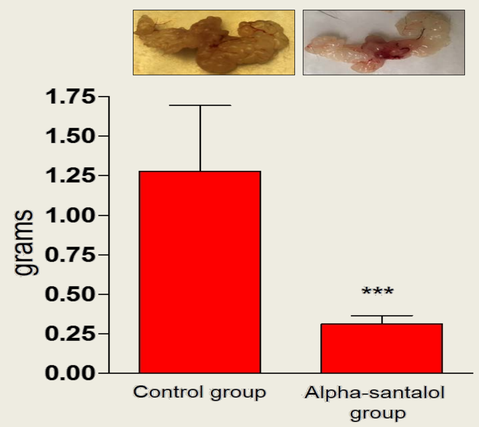
Effect of alpha-santalol on body weight



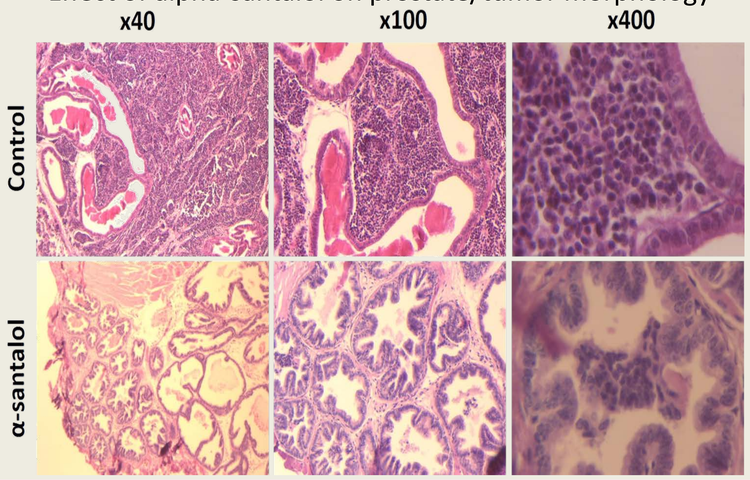
Effect of alpha-santalol on tumor incidence



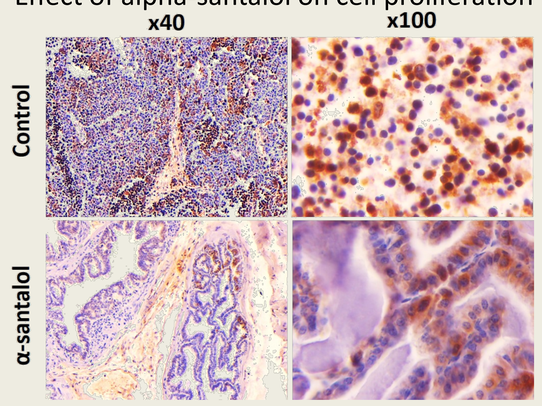
Effect of alpha-santalol on GU weight



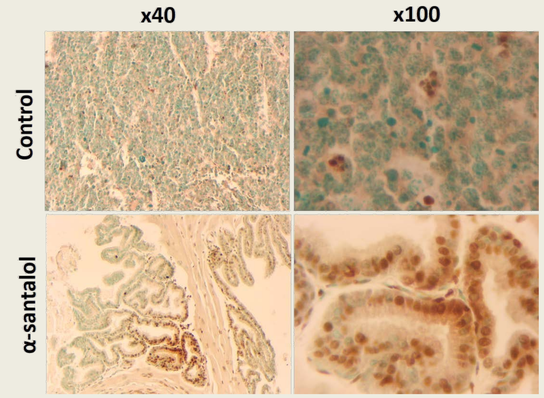
Effect of alpha-santalol on prostate/tumor morphology



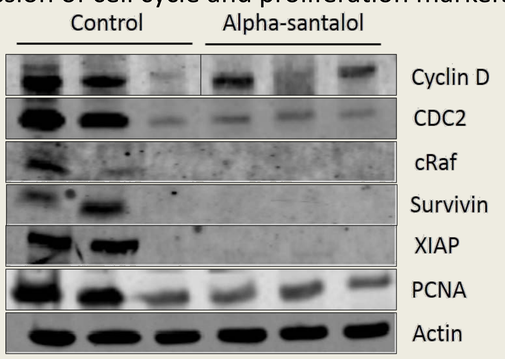
Effect of alpha-santalol on cell proliferation



Effect of alpha-santalol on apoptosis



Expression of cell cycle and proliferation markers



SUMMARY

- **Administration of control/vehicle and alpha-santalol in TRAMP mice did not result in any abnormal weight gain/loss through out the study.**
- **Alpha-santalol treatment resulted in a significant decrease in tumor incidence and genitourinary tract (GU) and prostate weights compared to control-treated mice.**
- **Mice treated with alpha-santalol exhibited decreased cell proliferation (Ki-67 staining) in association with induction of apoptosis (TUNEL-positive cells).**
- **Western blotting analysis of prostate/tumor samples from α-santalol-treated group revealed a decrease in survivin, XIAP, PCNA, cyclin D and CDC2 levels compared to control-treated samples.**