Molecular mechanism of anti-prostate cancer activity of Scutellaria baicalensis extract.


Source

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Abstract

Scutellaria baicalensis is a widely used Chinese herbal medicine historically used in antiinflammatory and anticancer therapy. The goals of the study were to 1) determine its in vitro and in vivo anti-prostate cancer activity, 2) investigate its molecular mechanism directed at cell proliferation control including cyclooxygenase-2 (COX-2) prostaglandin E2 (PGE2) and cyclins/cdk5 pathways, and 3) compare it with those of PC-SPES (PC stands for prostate cancer and spes is Latin for hope), a former herbal mixture for prostate cancer treatment of which S. baicalensis is a major constituent. Two human prostate cancer cell lines (LNCaP, androgen dependent, and PC-3, androgen independent) were assessed for growth inhibition. S. baicalensis exerted dose- and time-dependent increased growth inhibition in both cell lines. However, the PC-3 cells IC50 (50% growth inhibition concentration) were slightly more sensitive than LNCaP cells (IC50=0.15 mg/ml), although the former is androgen independent. S. baicalensis was more effective in inhibition of cell growth compared with PC-SPES (IC50=0.38 mg/ml for PC-3 cells). Significant reduction of PGE2 synthesis in both cells after treatment with S. baicalensis resulted from direct inhibition of COX-2 activity rather than COX-2 protein suppression. S. baicalensis also inhibited prostate-specific antigen production in LNCaP cells. Finally, S. baicalensis suppressed expression of cyclin D1 in LNCaP cells, resulting in a G1 phase arrest, while inhibiting cdk1 expression and kinase activity in PC-3 cells, ultimately leading to a G2/M cell cycle arrest. Animal studies showed a 50% reduction in tumor volume after a 7-wk treatment period. This study demonstrated that S. baicalensis may be a novel anticancer agent for the treatment of prostate cancer.

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