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Impact of quercetin, diallyl disulfide and nimbolide on the regulation of nuclear factor kappa B expression in prostate and breast cancer cell lines

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NFkB is a key regulator of genes involved in cell activation and proliferation. Activation of NFkB has been implicated in prostate and breast cancer development and growth. Quercetin, a flavonoid from onion, diallyl disulfide (DADS) an organsulfur compound from garlic and nimbolide, a tetra nortriterpenoid from neem leaf have been shown to have anticancer activities in various cancers. All the above compounds decreased the prostate and breast cancer cell viability. The IC-50 value of PC-3 cells of quercetin was 100 μM; DADS was 40 μM for 24 h; IC-50 value of breast cancer cells such as MCF-7, MDA-MB-231 cells were 4 μM/ml and 6 μM/ml, respectively. Therefore, for further studies 50 and 100 μM quercetin, 20 and 40 μM DADS were selected for prostate cancer treatment. 2 and 4 μM/ml nimbolide concentrations for MCF-7 cells and 4 and 6 μM/ml for MDA-MB-231 breast cancer cells were considered for further study. PC-3 cells were treated with quercetin/DADS, MCF-7/MDA-MB-231 cells were treated with nimbolide.NFkB protein expression was studied by western blot. Protein expressions of IKKαand IKKβwere also studied on DADS treated PC-3 cell line and nimbolide treated both breast cancer cell lines by western blot. Quercetin/DADS decreased the expression of NFkB on PC-3 cells. DADS significantly decreased IKKα, IKKβ and NFkB expressions on PC-3 cells. Nimbolide also significantly decreased the protein expressions of IKKα, IKKβ and NFkB in both breast cancer cell lines. Therefore, the present investigation showed down regulation of nuclear factor kappa B factor expression in androgen independent prostate cancer cells by quercetin or DADS. Nimbolide also did the same on estrogen positive and negative breast cancer cell lines. The data will be discussed with Akt and MAPK signaling regulation on prostate and breast cancer cell lines.