Adiponectin inhibits oxidative stress in human prostate carcinoma cells.


Source

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Abstract

BACKGROUND:

Emerging data suggest that obesity increases the risk of aggressive prostate cancer (PC), but the mechanisms underlying this relationship remain to be fully elucidated. Oxidative stress (OS) is a key process in the development and progression of PC. Adiponectin, an adipocyte-specific hormone, circulates at relatively high levels in healthy humans, but at reduced levels in obese subjects. Moreover, case-control studies also document lower levels of serum adiponectin in PC patients compared with healthy individuals.

METHODS:

Human 22Rv1 and DU-145 PC cell lines were examined for the generation of OS and detoxification of reactive oxygen species after treatment with adiponectin. Normality was confirmed using the Shapiro-Wilk test and results were analyzed using a one-way analysis of variance.

RESULTS:

We demonstrate that adiponectin increased cellular anti-oxidative defense mechanisms and inhibited OS in a significant and dose-dependent manner. We show that adiponectin treatment decreased the generation of superoxide anion in both cell lines, whereas the transcript levels of NADPH oxidase (NOX)2 and NOX4 increased. We also found indications of an overall anti-oxidative effect, as the total anti-oxidative potential, catalase activity and protein levels, and manganese superoxide dismutase protein levels increased significantly (P<0.05) in both cell lines after treatment with adiponectin.

CONCLUSION:
Lower levels of adiponectin in obese individuals may result in higher levels of prostatic OS, which may explain the clinical association between obesity, hypoadiponectinemia and PC.

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