Mechanism for link between high fat diet and risk of prostate cancer and disorders unveiled

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Prostate cancer is the second leading cause of cancer-related deaths in men with an estimated 192,280 new cases diagnosed in the US in 2009 (Jemal 2009). Diet is considered one of the most important controllable risk factors for inflammation and prostate diseases including benign prostatic hyperplsia (BPH), prostatitis, and prostate cancer.

Sanjay Gupta, MS, PhD, Carter Kissell associate professor & research director in the Department of Urology and associate professor in the Department of Nutrition in the Case Western Reserve School of Medicine, and his team of post-doctoral fellows have focused on understanding the mechanisms of the deleterious effects of a high fat diet on the prostate. Previously, Dr. Gupta's team demonstrated that nuclear factor kappa B (NF-□B), a protein complex that controls DNA transcription which is activated as a result of inflammation and stress, is constitutively activate in human prostate adenocarcinoma and is related to tumor progression (Shukla S et al, Neoplasia, 2004).

In a study, "High Fat Diet Increases NF-□B Signaling in the Prostate of Reporter Mice", released online today in the journal "The Prostate" (www3.interscience.wiley.com/jo … rnal/106561909/issue), Dr. Gupta and his team demonstrate that a high fat diet results in activation of NF-□B in the abdominal cavity, thymus, spleen, and prostate (Vykhovanets et al, The Prostate, 2010). Non obese NF-□B reporter mice were fed a high fat diet for four, eight, and 12 weeks. Compared

with mice fed a regular diet, the high fat diet group had significant increases in prostate weight, and in the prostate expression of markers of oxidative stress (such as NADPH), and inflammation (such as the downstream targets of NF-?B: nitric oxide synthase, and cyclooxygenase [COX-2]) were increased. These studies provide direct evidence that a high fat diet causes proliferation, inflammation, and oxidative stress that can lead to benign prostatic hyperplasia, prostatitis, and cancer of the prostate, some of the most common disorders affecting adult men.

"Our studies provide evidence that a high-fat diet increases the activation of NF-?B along with elevated levels of NADPH oxidase components which might lead to intraprostatic inflammation. This study strengthens the link between a high-fat diet—typical of "Western style" high fat diet—as a potential cause of prostatic diseases including BPG and prostate cancer," said Dr. Gupta.

Provided by Case Western Reserve University