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## **Local inflammation influences oestrogen metabolism in prostatic tissue.**

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### **Source**

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### **Abstract**

What's known on the subject? and What does the study add? The role of oestrogen in prostatic inflammation has been extensively shown. The catechol oestrogens are known to be more potent oestrogenic moieties that not only aggravate the inflammatory response in situ, but are also believed to have oxidative stress and genotoxic effects. The present study highlights a significant role of inflammation in oestrogen metabolism and, particularly, in generating 'bad' oestrogen metabolites. This finding may pave the way for new therapeutic methods for the treatment and/or prevention of prostate diseases.

### **OBJECTIVE:**

- To investigate the impact of experimentally induced inflammation on oestrogen metabolism in rat prostate.

### **MATERIALS AND METHODS:**

- Prostatitis was induced in normal and oestrogen-treated male rats by injecting 2% carrageenan solution into the ventral prostate. After 48 h, the rats were killed and the ventral prostate was collected.
- Prostatic inflammation and proliferation were confirmed by gross visual evidence, histology and elevated tumour necrosis factor- $\alpha$ , prostaglandin E(2) and cyclin-D(1).
- Expression of oestrogen-metabolizing enzymes was assessed using capillary electrophoresis, and oestrogen metabolites within prostate tissue were assayed using liquid chromatography mass spectrometry.

### **RESULTS:**

- Animals exposed to carrageenan insult combined with oestrogen treatment showed the most prominent inflammatory and proliferative response.
- Treatment of animals with oestrogen alone induced moderate inflammation and proliferation.
- Oestrogen-metabolizing enzymes

were overexpressed in animals with experimental prostatitis with sequential accumulation of catechol oestrogens within prostatic tissues. • Oestrogen receptor- $\alpha$  was underexpressed in the prostatitis with oestrogen group, while oestrogen receptor- $\beta$  was overexpressed.

#### **CONCLUSIONS:**

- The present work provides experimental evidence that local inflammation enhances oestrogen synthesis and directs oestrogen metabolism to generate catechol oestrogens within prostatic tissues.
- This may contribute, at least partly, to enhanced prostatic cell proliferation.