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ORIGINAL ARTICLE

Myeloperoxidase and Prostate volume: A preliminary study

Myéloperoxidase et volume prostatique : étude préliminaire

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KEYWORDS
Angiotensin;
Prostate hyperplasia;
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Oxidative stress

Summary
Objectives. — Oxidative stress is associated with the development of BPH and might be modulated by several factors. Myeloperoxidase (MPO) has recently been observed in prostate tissue. Our goal was to investigate the correlation between MPO and the prostate volume.
Material and methods. — Hundred and twenty-one patients (48—70 years) with a filled IPSS were prospectively included. Blood sampling (PSA, testosterone, Angiotensin II (AngII), MPO, Mox-LDL) and transrectal ultrasound of the prostate were performed with total volume (TV) and transitional zone volume (TZ) measurements. For correlation, univariate analyses were depicted by Pearson's coefficient. Multilinear regression analysis used a stepwise backward selection of the explicative variables.

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Results. — In multivariate analysis, the TV was positively correlated to the combination of age and Ang II but negatively to MPO specific activity (Std Coef = —0.272, $P = 0.004$). Significant correlations were confirmed between TZ, age and MPO specific activity but not with Ang II. A negative correlation between TZ and MPO specific activity was also observed (Std Coef = —0.21, $P = 0.016$). No correlation was found with Mox-LDL.
Conclusions. — Negative correlation between MPO and prostate volume was observed but careful interpretations may be endorsed and longitudinal study is necessary. It seems relevant to focus on the potential contribution of MPO in the development of prostatic diseases as this enzyme can also promote DNA oxidation.
Level of evidence. — 4.

MOTS CLÉS
Angiotensine ;
Volume prostatique ;
Myéloperoxidase ;
Stress oxydatif

Résumé
Introduction. — Le stress oxydatif est associé au développement de l'hypertrophie de prostate, modulé par plusieurs facteurs. La Myéloperoxidase (MPO) a récemment été retrouvée au niveau prostatique. Notre objectif était d'étudier la corrélation entre la MPO et le volume de la prostate.
Matériel et méthode. — Cent-vingt-et-un patients (48—70 ans) avec un questionnaire IPSS ont été inclus prospectivement. Un prélèvement sanguin (PSA, Angiotensine II (Ang II), testostérone, MPO, Mox-LDL) et une échographie transrectale de la prostate ont été effectués pour chaque patient avec des mesures du volume total (VT) et du volume de la zone de transition (ZT). Des analyses univariées représentées par le coefficient de Pearson et des analyses de régression multilinéaire ont été effectuées pour mettre en évidence d'éventuelles corrélations.
Résultats. — En analyse multivariée, le VT était positivement corrélé à l'âge et l'Ang II mais négativement à l'activité spécifique de la MPO (Std Coef = —0,272, $p = 0,004$). Des corrélations significatives ont été confirmées entre ZT, âge et activité spécifique de la MPO mais pas avec l'Ang II. Une corrélation négative avec l'activité spécifique de la MPO a également été observée (Std Coef = —0,21, $p = 0,016$). Aucune corrélation retrouvée avec les Mox-LDL.
Conclusion. — Une corrélation négative entre MPO et volume de la prostate doit rester d'interprétation prudente et une étude longitudinale serait nécessaire pour mettre en évidence une possible influence sur le volume. Il semble néanmoins pertinent de se concentrer sur la contribution potentielle de la MPO dans le développement des maladies prostatiques, car cette enzyme favorise l'oxydation de l'ADN.
Niveau de preuve.— 4.

Introduction

Benign prostatic hyperplasia (BPH) is a very common age-related disease [1].

Several parameters including androgens, dietary factors, inflammatory mediators and oxidative stress have been considered to play a role for the development of BPH, but there is no consensus as to which is the primary one [2].

Oxidative stress is associated with aging and age-related degenerative diseases such as BPH. Chronic inflammation is well documented in the development of BPH but the significance of inflammation on the development and severity of lower urinary tract syndrome (LUTS) due to BPH has not been established yet [3].

In vivo, oxidative stress might be modulated by several enzymes or proteins such as myeloperoxidase (MPO) and angiotensin II (Ang II). In response to a high level of pro-inflammatory cytokines, MPO can promote oxidative damages to host tissues [4]. MPO has recently been observed in prostate tissue and this intriguing location might be linked to prostate diseases [5]. Causes of intraprostatic inflammation remain unclear and it has been suggested that systemic inflammation could contribute to the progression of inflammation within the prostate. Ang II exerts a variety of biological actions, including (i) NADPH oxidase (NOX) activation, (ii) stimulation of cell growth, migration, and inflammation of smooth muscle cells and fibroblasts, (iii) facilitation of sympathetic activity [6—9]. In this context, a higher Ang II specific activity was reported in patients suffering of BPH compared to healthy patients. However, Ang II functional significance for the pathophysiology of BPH is poorly understood [11].