BRIEF REVIEW

Quercetin remain promising for Chronic Prostatitis treatment

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Quercetin is a plant flavonol from the flavonoid group of polyphenols. These micronutrients are components of certain plant-based foods and exhibit antioxidant properties. More specifically, quercetin is found in various quantities in many fruits, vegetables, leaves, seeds, and grains. Among common foods containing large amounts of this flavonol, are red onions apples, black tea, red wine and kale [1]. It exhibits antiproliferative, antioxidant and antiandrogenic properties and promotes or inhibit metabolic reactions.

More precisely, it inhibits the oxidation of other molecules by acting as a scavenger of free radicals that are responsible for oxidative chain reactions [2]. Moreover, it inhibits the PI3K/AKT pathway leading to downregulation of the anti-apoptotic protein Bcl-w [3]. It has also been shown to activate or inhibit the activities of a number of proteins [4]. Finally, it has also been reported to have several estrogenic activities by activating estrogen receptors [5]. Notably, when combined with tamsulosin, quercetin or quercetin metabolites proved to be far more potent than the compounds in isolation in relaxing the smooth muscles of urethra [6].

All the above properties render quercetin as a potentially effective phytotherapeutic agent for the treatment of chronic prostatitis (CP). However, although it has been widely used for years, by healthy men for prevention purposes and by patients for the cure of lower urinary tract symptoms and pain related to prostatitis, there are quite few studies examining its efficacy [7]. Reasons explaining this discrepancy are practically unknown; however, some evident drawbacks such as quercetin's low absorbance and low bioavailability probably discouraged both clinician and researchers for a thorough evaluation. In fact, its sparingly soluble nature in water, makes its absorption rather difficult. Actually, the absorption of quercetin is generally low ranging from 36 to 53% [8]. Given that the absorption of quercetin aglycone is substantially higher ranging from

65-81% it could be assumed that the form of quercetin itself determine the absorbance rate. As a matter of fact, it was demonstrated that quercetin glucosides are hydrolysed by bacterial enzymes in the small intestine [9].

Moreover, the bioavailability of quercetin is low to middle and highly variable (0–50%). In fact, following dietary ingestion, quercetin undergoes rapid and extensive metabolism and it is rapidly cleared with an elimination half-life of 1–2 hours after ingesting quercetin foods or supplements. [10]. In this case the absorbance rate of quercetin is determined by dietary factors. Ingestion with high-fat foods may increase bioavailability compared to ingestion with low-fat foods and carbohydrate-rich foods may increase absorption of quercetin by stimulating gastrointestinal motility and colonic fermentation [11,12].

In confirmation to the above experimental observations, a small study demonstrated higher improvement rates in a higher percentage of prostatitis patients treated with quercetin when the last was administrated in combination with papain (which enhances the absorption of bioflavonoids). In contrast, the placebo-controlled group showed lower improvement rates in only 25% of the patients [13].

Almost 10 years later, in a larger study from the same centre, combination of quercetin with the enzyme's bromelain and papain (which increase the absorption of bioflavonoids) administrated as phenotypical treatment in patients with CP type-IIIb for 6 months, provided greater improvement (as measured in NIH-CPS questionnaire) compared with other treatments [14].

Since then, only two studies examining the efficacy of quercetin individually or in association with other drugs in CP treatment were published. A recent two-arm trial of Krakhotkin et al., tested the combination of Quercetin and Cernilton (1gr + 63mg respectively) as a part of multimodal therapy in CP patients corresponding to UPOINT organ-specific & tenderness domains. According to their report, the clinical phenotypes significantly changed after treatment while the difference in the decrease in total NIH-CPSI score and increase in QOL score between the intervention group and non-intervention group was statistically significant [15]. Another recent small trial Maurizi et al., compared the efficacy of pollen extracts (Deprox) versus bioflavonoids (quercetin) in the treatment of CP type-III. According to their report, pollen extracts have demonstrated a significant improvement of the symptoms and quality of life of patients. Furthermore, there was a statistical difference in the average waiting time of the variation of the NIH-CPSI) score without side effects as compared to the bioflavonoids complex with quercetin [16].

In conclusions, quercetin remain promising for CP treatment however more focused research is needed in order to better understand this useful phytotherapeutic agent and take the most from it

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