Chemoprevention of Human Prostate Cancer by Green Tea Catechins: Two Years Later. A Follow-up Update

Prostate cancer (CaP) progresses slowly and clinical is usually diagnosed in very elderly men. Delaying disease onset by a few years would reduce incidence, which makes it an ideal target for chemoprevention strategies. We and others showed that both Green Tea Catechin (GTC) and EGCG possess anti-tumour activity in vitro, as well as in vivo in the TRAMP mouse model [1,2]. We suggested that administration of GTCs might be beneficial in the early stages of cell transformation but not later, when cancer had already developed.

We performed a clinical trial in 60 volunteers bearing HGPIN, the main pre-malignant lesion of CaP, to assess the efficacy of GTCs for chemoprevention, as published [3]. Volunteers consumed GTCs (600 mg per day tid) or placebo for 1 year. Subjects received two follow-up saturation biopsies [4], at 6 months and one year. Only 1 tumour was diagnosed in the GTCs-arm (incidence: 3%), while 9 cancers were found in the placebo-arm (incidence: 30%); no related adverse effects were reported.

Was CaP progression prevented definitively or simply delayed during treatment? We performed another round of prostate mapping in a subset of these patients. The mean follow-up from the end of GTCs dosing was 23.3 months for placebo-arm (range: 12–30) and 19.1 months for GTCs-arm (range: 12–30). Only 9 from the placebo-arm and 13 from the GTCs-arm underwent this third prostate mapping. Despite the high drop–out rate (57% and 55%, respectively), the two arms remained balanced and large enough for statistical analysis.

Figure 1 shows a Kaplan-Meier plot of study data. Three further cancer diagnoses appeared during follow-up, two in the placebo arm and one in the GTCs-arm. The final difference in cancer prevalence is highly significant ($p < 0.01$) by $\chi^2$ test analysis. These results suggest that the inhibition of prostate cancer progression achieved in these subjects after one year of GTCs administration was long-lasting. The early emergence of benefit observed at 6 months suggests a treatment effect on early lesions. Overall, treatment with GTCs led to an almost 80% reduction in CaP diagnosis, from 53% to 11%, suggesting that an important decrease of sanitary costs related to this disease could be achieved [5].

This chemoprevention approach in high risk patients would fulfil a significant therapeutic and social need, thus opening a new scenario for a novel and effective clinical approach for CaP. A larger confirmatory trial of these results is currently underway (Kumar N. et al, Moffitt Cancer Centre, Tampa Fl, USA; personal communication).

Fig. 1 – Kaplan-Meier analysis of final result showing the prevalence of prostate cancer at 6- and 12-mo check (previous study) as well as 2 years later following suspension of GTC administration (follow-up study).
Conflicts of interest: The authors have nothing to disclose.

References


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Green tea catechins (GTCs), and especially EGCG, have been shown to be potent chemopreventive agents in vitro and in many in vivo animal models of induced carcinogenesis (3, 4). The systematic study of the biological and biochemical properties of GTCs only started quite recently, searching for possible molecular explanations for their effect on cancer cells. Altogether, our data suggest that up to 90% of chemoprevention efficacy can be obtained by GTCs administration in men prone to develop CaP. Protective effect of green tea against prostate cancer: a case-control study in southeast China. Int J Cancer 2004; 108: 130–5. OpenUrl CrossRef PubMed. Background: Prostate cancer is one of the most frequent types of cancer. Despite the existence of various treatment strategies, treatment of prostate c... Conclusion: The main mechanisms of the anticarcinogenic action of catechins are subdivided into two major types: (i) direct action on cancer cells and (ii) indirect effect based on catechins’ impact on the microenvironment of cancer cells, particularly in relation to the immune system. At this level catechins might reduce tumor-associated inflammation and immune tolerance.