

## Changes in lymphocyte count induced by repeated cycles with low-dose interleukin-2 and interferon- $\alpha$ in 146 patients with renal cell carcinoma

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### ABSTRACT

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**Aims and background.** The exact mechanism by which recombinant interleukin-2 and interferon- $\alpha$  modulate the immunological response, inducing long-term responses in metastatic renal cell carcinoma, is still not clear. The aim of the study was to analyze the modifications in peripheral blood lymphocytes during cycles of low-dose immunotherapy as a marker of the biological response to the treatment in 146 patients with renal cell carcinoma (advanced and localized disease).

**Methods and study design.** Peripheral blood lymphocytes were evaluated before and after every cycle of treatment.

**Results.** We found a statistically significant overall difference between pre- and post-cycle values (mean increase of 39%). The differences between pre- and post-cycle lymphocyte counts for each cycle were significant. Also, the post-cycle lymphocyte count of each cycle remained higher than the baseline value. Furthermore, pre-cycle lymphocyte counts of each cycle were still higher than the baseline value, with no difference between a pre-cycle lymphocyte mean value and the other one (except that between the first and second cycle). From the end of each cycle, but before starting the next one, the absolute value of lymphocytes fell on the average by 15-30%, concurring with the fact that, even starting from pre-cycle values higher than baseline, the immune system remains sensitive to chronically repeated stimulation by immunotherapy. We also found that non-metastatic patients had a higher number of peripheral blood lymphocytes than metastatic patients, whereas the latter had a lower immune response to therapy.

**Conclusions.** The results support the idea that "maintenance" immunotherapy may not develop resistance over time in terms of biological response and thus may have a role as chronic therapy in combination with other drugs such as target therapy. We suppose that the immune system of patients with metastases is in a state of relative impairment, resulting in less sensitivity to immunostimulating agents.

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**Key words:** immunological response, interferon- $\alpha$ , interleukin-2, lymphocyte, renal cell carcinoma.

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