

Clinical use of neopterin, a laboratory biomarker of immune activation, in prognosis, monitoring response to therapy and complications in cancer patients

Introduction

Neopterin is a biomarker of immune activation and is synthesized from GTP in a reaction catalyzed by enzyme GCH-1. Neopterin levels reflect the body's response to inflammatory conditions such as infections, injuries, chronic diseases, and cancer. Its levels also fluctuate with anticancer therapies that demonstrate immune activity. Remarkably neopterin has also been found to be a marker of poor prognosis in cancer.

Aim

To investigate clinical use of neopterin, a biomarker of immune response, in the assessment of prognosis, monitoring response to therapy, and complications in cancer patients.

Methodology

In a two-part study, serial urinary neopterin were measured in two different cohorts of patients who underwent anticancer therapy. In part one, samples from 45 patients with diagnosis of metastatic colorectal cancer who were being treated with chemotherapy + cetuximab were analyzed. In part two, samples from 10 patients with diagnosis of gynecological malignancy, mostly cervical cancer undergoing chemoradiotherapy were analyzed.

Results

In patients with metastatic colorectal carcinoma, higher neopterin levels were associated with poor prognosis. In this cohort, neopterin levels showed correlation to hemoglobin levels, white cell count and CEA. In patients with gynecological cancer, pretreatment neopterin levels were generally higher. No association of therapy-associated changes in neopterin levels were observed, however, we were able to demonstrate that the rises in neopterin were related with complications.

Conclusion

With our data we have been able to demonstrate the potential clinical uses of neopterin in prognosis, monitoring response to therapy and complications in cancer patients. However, much larger studies with different tumor types could be performed to corroborate and refine the methodology to put neopterin in clinical practice.