

## ABSTRACT

**Introduction:** Procalcitonin (PCT) is a 13 kD protein with a chain of 116 amino acids. It consists of parafollicular cells of the thyroid gland. Inflammatory procalcitonin is made up of 114 amino acids. Procalcitonin from plasma in the course of inflammatory process, does not consist of C-cells of the thyroid gland but it is generated in the liver, and, to a lesser extent, in the lungs, kidneys, testes, prostate and small intestine.

**Objectives:** 1. To compare the levels and the dynamics of C-reactive protein (CRP) and procalcitonin in the inflammatory process. in three patients with different diagnoses. To compare the number of examined PCT according to indicated VFN (General University Hospital) departments in the years 2009, 2012 and 2015. 3. To study the dynamics of the number of examined PCT in the years 2001- 2016.

**Methods:** The levels of CRP and PCT were measured in the ÚLBLD laboratory of the General University Hospital in Prague in the period from May 20 to June 17, 2016. The CRP was measured by immunoturbidimetric analyzer UnicelDxC 880i. The PCT was measured by the Cobas analyser using the electrochemiluminescence technology. In order to evaluate the data, graphs were processed with levels of both analytes for 3 patients. Further, data needed for the evaluation of the above mentioned objectives no. 2 and 3 were also processed.

**Results:** A greater sensitivity and PCT specificity was demonstrated, in contrast to CRP while differentiating infectious and non-infectious systemic inflammation. 1) Level of procalcitonin (PCT) in the patient D. P. decreased faster than that of the C-reactive protein (CRP) after administration of antibiotics. In the case of the patient D.J., a noticeable drop in PCT has been observed within three days, reflecting a good prognostic indicator of the patient status. The patient Š. B. with pancreatitis exhibited high levels of CRP, but low PCT levels. Therefore, PCT does not respond to an inflammatory stimuli without encountering infectious agents. 2) Our laboratory at ÚLBLD (Prague General University Hospital) performed 11673-12667 determinations of procalcitonin per year in the years 2009, 2012 and 2015. The biggest fall in the number of PCT tests was observed within the patients treated at the Oncology clinic. On the other hand, enhanced determination of procalcitonin was performed at the departments of Pediatrics and Adolescent medicine, as well as at the Surgery clinic. Most of the examinations of PCT was carried out by internal departments of the hospital, as well as by

the department of Anesthesiology and Intensive care medicine, as well as by the Cardiology clinic. 3) The dynamic of PCT tests in the years 2001-2016 reflects the introduction of new tests into practice.

**Conclusion:** The examination of procalcitonin is indicated for patients in critical condition in order to monitor their state during treatment. Thus, procalcitonin is a suitable marker to distinguish the syndrome of systemic inflammatory response syndrome (SIRS) and sepsis. It also serves as an indicator for starting or finishing the antibiotic treatment.

**Key words:** procalcitonin, C-reactive protein, SIRS, sepsis