

New insights in the pathophysiology of inflammation

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Inflammation is a physiological mechanism of the response of the organism to the injury. This mechanism is phylogenetically highly conserved among humans and many other animal species. Despite of its vital significance to the lifelong homeostasis, prolonged inflammation can be detrimental to the health. Excessive generation of inflammatory mediators has been linked to tissue damage and compromised tissue repair process. Acute and chronic inflammation are therefore essential to many diseases and pathological conditions such as atherosclerosis, heart failure, cancer, thrombosis and many others. In this issue we present a series of articles featuring various aspects of inflammation and discussing how inflammation relates to various pathophysiological processes and mechanisms. The articles follow the presentations brought by speakers at the 11th EFCC Continuous Postgraduate Course in Clinical Chemistry: New Trends in Classification, Diagnosis and Management of Inflammation, in Dubrovnik, 22-23 October, 2011.

There is now ample evidence that systemic inflammation is the underlying process in patients with the chronic heart failure. Furthermore, it has been hypothesized that increasing levels of inflammatory cytokines might correlate with the disease severity (1). In his review on the use of biomarkers of inflammation and cardiac remodeling for the risk stratification of heart failure patients, Gruson *et al.* present some established markers and challenges and pitfalls we need to face when searching for novel biomarkers and assessing their potential benefits. Those challenges include a thorough ana-

lytical and clinical evaluation, cost-effectiveness analysis, accessibility, automated platform, short turn-around time etc. (2).

Also featured in this issue is an article by Burri and Beglinger, which addresses the role of faecal calprotectin in human health and disease and its potential to improve diagnostic and treatment strategies in patients with inflammatory bowel disease. If measured in feces, calprotectin correlates with the degree of neutrophil infiltration of the intestinal mucosa. It has therefore been postulated that fecal calprotectin might identify patients with IBD, assess disease activity, and predict relapse (3).

It has been well established that chronic inflammation predisposes individuals to various types of cancer. Moreover, the host response to malignant disease shares many common mechanisms with inflammatory process. The review by Del Prete discusses the role of inflammation in tumor progression and metastasis and provides an overview on the molecular mechanisms underlying the cancer-related inflammation (4). Understanding these mechanisms not only provides new knowledge on the complex interplay of the carcinogenesis and inflammation, but also contributes to the identification of new targets for therapeutic intervention.

Neonatal sepsis is the single most common cause of death in neonates and as such presents the serious life-threatening pathophysiological condition that needs to be recognized and treated as early as possible. The quest for sensitive and specific early markers of neonatal sepsis is still ongoing.

In her review, Mihatov gives an overview of the incidence, etiology, clinical signs, diagnostics and therapeutic approach to the neonatal sepsis (5) whereas Hoffmann reviews the role of the neutrophil CD64 as an emerging promising new sepsis biomarker, both in adults and neonates. CD64 appears to have higher specificity and sensitivity than procalcitonin and its expression level correlates with disease severity and predicts mortality (6). As stated by Hoffmann, the CD64 assay is relatively simple and could easily be implemented in everyday practice. However, before recommendation

is made for the routine use of CD64 as a sepsis biomarker, large well designed multicenter studies are needed to support these promising observations.

While the role of inflammation in many diseases seems to be irrefutable, there are still many open questions and unresolved issues that need to be addressed. With this series of articles we wanted to highlight some of the most intriguing issues related to inflammation. We hope that our readers will find these reviews inspiring and useful for their research and everyday practice.

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