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Beta-defensin 2: a novel biomarker of infection

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Background: Inflammation is a response provided by the immune system, in order to maintain the normal tissue homeostasis systems during infection and tissue injury. The entire process of the inflammatory response is mediated by a variety of regulators involved in the selective expression of proinflammatory molecules such as inflammatory cytokines [e.g. interleukin-6 (IL-6)] chemokines and antimicrobial peptides (AMPs). AMPs have a critical role in the innate immune system on the grounds that they provide protection of the host from microbial infection. One important category of antimicrobial peptides are human defensins. The aim of the present study was to estimate the concentrations of human β-defensin -1 (hbd-1) in 347 serums, β-defensin -2 (hbd-2) in 422 serums, IL -6 in 414 serums and c – reactive protein (CRP) in 416 serums of patients with inflammation of infectious or noninfectious etiology and to examine their potential to serve as novel markers of infection.

Material/methods: CRP, hBD1, hBD2, IL – 6 were measured, in sera of patients with inflammation and healthy individuals, with standard methods using commercial nephelometry and ELISA assays. The obtained results were calibrated against kit standard reagents. Statistical analysis was followed.

Results: Our results demonstrate that human β-defensin 2 concentrations in patients with inflammation of infectious etiology were significantly higher than those in patients with inflammation of noninfectious etiology and healthy individuals (t=9,409, p<0,0001), whereas the levels of hbD-1 weren't statistically different in cases of infectious and non infectious inflammation. On the other hand, the levels of CRP were notably similar in patients with inflammation of infectious etiology (mean: 15,4 mg/dl) and no infectious etiology (mean: 10,9 mg/dl). Furthermore, there is a significant correlation

between the levels of IL-6 and BD-2 (r=0,8681, p<0,0001) and a weak association between IL-6 and BD-1 (p=0,0246). In addition, the levels of hbd2 in patients with cancer (without infection) weren't significantly higher compared to the levels in patients without cancer (p=0,0066) and healthy individuals (p=0,0144). Analysis of serial samples indicated that CRP was increased continuously and no specific in every patient with inflammation, whereas hbd – 2 and il-6 were associated with the appearance of infection.

Conclusions: Taking these evidence together we conclude that BD-2, could be used as a novel diagnostic marker of infection. In contrast to CRP, which is a very useful nonspecific biochemical marker of inflammation, BD-2 have the potential to make the distinction between inflammatory of infectious and non infectious etiology.

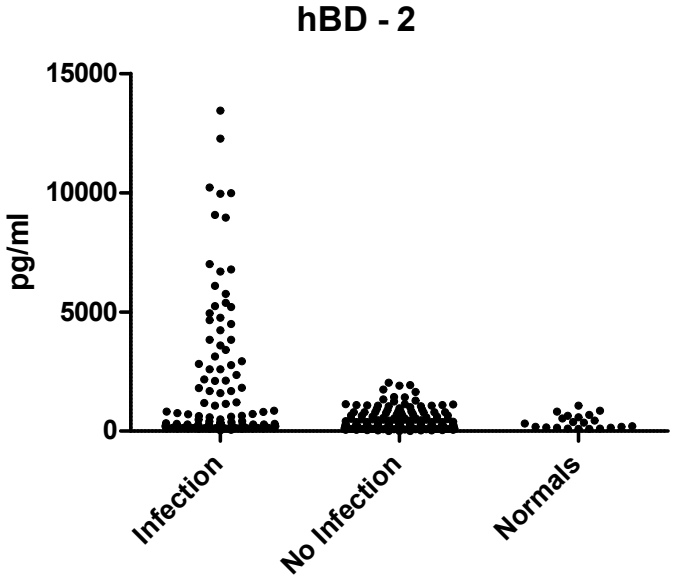

Figure 1: *Levels of hbd-2 in patients with inflammation of infectious or non infectious etiology and healthy individuals.*