

Biomarkers in urinary tract infections – which are suitable for diagnostics and follow-up



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Abstract

Introduction: Urinary tract infections (UTIs) are one of the most common infections worldwide. Under special circumstances, clinicians must rely on laboratory findings, which might have a weak predicting value, misguiding the practitioners and leading to incorrect diagnosis and overuse of antibiotics. Therefore, there is an urgent need for reliable biomarkers in UTIs.

Methods: We performed a literature search for biomarkers used in UTIs from January 1999 until May 2020. We used “urinary tract infection” and “biomarker” as the main key words in the PubMed, Medline and Cochrane databases. After peer review, we excluded the duplicates and identified the suitable articles, from which we collected the data and divided the available biomarkers into 5 groups: i) conventional markers; ii) promising, thoroughly studied biomarkers; iii) promising biomarkers that need further studies; iv) biomarkers of unknown significance; v) controversial, not useful markers.

Results: We found 131 articles, mostly from the paediatric population. Neutrophil gelatinase-associated lipocalin (NGAL) and interleukins (IL) have a leading role in diagnosing and differentiating UTIs based on a lot of observational, comparative trials. Heparin binding protein (HBP), lactoferrin (LF), heat-shock protein-70 (HSP-70), human defensin-5 (HD-5), lipopolysaccharide binding protein (LBP) and mass spectrometry studies are promising, but confirming data are lacking. The measurable components of the innate immune system and local host cell response could be appropriate biomarkers, but their significance is currently unknown.

Conclusions: Conventional biomarkers for UTIs have low specificity. The use of urinary NGAL and interleukins could improve the sensitivity and specificity of laboratory diagnosis of UTIs.