Neutrophil CD64 index as a good biomarker for early diagnosis of bacterial infection in pregnant women during the flu season

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Abstract

Backgroud Pregnant women are at high risk of developing febrile illness during the flu season. Early identification of a viral or bacterial infection is crucial in the management of febrile pregnant patients. Neutrophil CD64 (nCD64) has been shown to have more important diagnostic value in sepsis than traditional inflammatory indicators. Methods The pregnant women enrolled were divided into three groups according to disease: influenza A infection, bacterial infection and healthy controls. Peripheral blood CD64, leukocyte, C-reactive protein (CRP), procalcitonin (PCT) and human Th1/Th2-related cytokines levels were routinely measured. The correlation between and diagnostic value of the nCD64 index and other biomarkers were evaluated using Spearman's correlation test and receiver operating characteristic (ROC) curve analysis. Results Pregnant women with bacterial infection had significantly elevated levels of leukocytes (8.4 vs. 5.95, $10\hat{}9$/L; P=0.004), CRP (89.70 vs. 50.05, mg/ml; P=0.031), PCT (0.13 vs. 0.04, ng/ml; P=0.010), and TNF-α (0.46 vs. 0.38, pg/ml; P=0.012) and an elevated nCD64 index (12.16 vs. 0.81; P<0.001) compared to those with influenza A infection. The area under the curve (AUC) of the nCD64 index to discriminate bacterial infection among pregnant women (area = 0.9183, P < 0.0001) was the largest. The sensitivity and specificity of the nCD64 index at an optimal cut-off value of 3.16 were 84% and 100%, respectively, with a negative predictive value (NPV) of 94%. Conclusions Our study demonstrates the clinical value of the nCD64 index in distinguishing between bacterial infection and influenza A in pregnant women during the flu season.

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