
Linoleic acid levels in patient peripheral blood cells may serve as a biomarker of acute scrub typhus

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Scrub typhus (ST) is an acute febrile illness in human caused by obligate intracellular Gram-negative bacterium *Orientia tsutsugamushi* (OT). OT exploits white blood cells during infection. Previous studies in mouse models showed that OT infection alter host lipid metabolism. Therefore, current study was focused to investigate the changes in the fatty acid profile in peripheral blood cells (PBC) from acute ST patients in response to OT infection to determine its potential to serve as a disease biomarker. OT infection was confirmed by diagnostic PCR (n= 17). Venous blood (2.5 mL) was collected into EDTA tubes from each subject with informed consent, PBC were separated, and cellular fatty acids were extracted. Fatty acid methyl esters (FAMES) were prepared and analyzed by a gas chromatograph equipped with column Rtx^R-WAX and flame ionization detector. Mean percentage area for each signal was calculated as a percentage of total fatty acids, and peaks were identified against authentic FAME standards. The (9Z,12Z)-octadeca-9,12-dienoic acid (linoleic acid) content in PCR positive subjects (n= 17) is significantly higher (p<0.05) than the levels detected in PCR negative subjects with febrile illness (n= 17) and the healthy subjects (n= 17). Logistic regression analysis of percentage linoleic acid content in PBC is predictive of ST infection (odds ratio, 3.19; 95% CI 1.35 – 7.56; p< 0.05) with an area under the receiver operating characteristic curve (AUC) of 0.82. The sensitivity and specificity of ST infection is 0.82 and 0.87 respectively at 1.98 % linoleic acid content suggesting its potential to serve as a biomarker of ST.

Keywords: Biomarkers, Linoleic acid, *Orientia tsutsugamushi*, Scrub typhus

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