Neurology and neurosciences

IP-10 AND IL-13 AS POTENTIALLY NEW, NON-CLASSICAL BLOOD-BASED CYTOKINE BIOMARKERS FOR ALZHEIMER’S DISEASE

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Introduction: The diagnosis of Alzheimer’s disease (AD) currently relies heavily on clinical assessments by trained specialists or high cost imaging methods. These methods of diagnosis are not easily accessible in poorer nations. As such, it is essential to identify reliable biomarkers to facilitate early, low cost, detection of AD. The present study therefore aims to identify potential blood-based cytokine biomarkers through cytokine profiling of blood samples from Malaysian AD patients.

Method: Further to informed consent from 39 healthy subjects and 39 probable AD patients, 8.5ml peripheral blood was collected and serum extracted. 25 µl serum was added to ELISA kits which bind and detect specific targeted cytokines. Concentrations of cytokines were measured at 615nm using a fluorometer. Ethics approval was obtained from the local ethics committee.

Results: IP-10 in AD patients (113.0 ± 5.8 pg/ml) was four-fold higher (p < 0.0001) than healthy subjects (28.2 ± 2.2 pg/ml) and this fold change is twice as high when compared to European AD patients. Besides, IP-10 exhibited strong inverse correlation with MMSE score (r = –0.7908; p < 0.0001). ROC curve analysis of the cutoff between IP-10 in AD patients and healthy subjects yielded an area of 1.0 (p < 0.0001). On the contrary, IL-13 in AD patients (1.6 ± 0.2 pg/ml) was 18-fold lower (p < 0.0001) than healthy subjects (29.5 ± 1.2 pg/ml). This fold change is nine times lower as opposed to those of European AD patients. IL-13 was strongly correlated to MMSE score (r = 0.7715; p < 0.0001) and ROC curve analysis demonstrated strong evidence of diagnostic accuracy (area = 1.0; p < 0.0001).

Conclusion: Both the non-classical pro-inflammatory IP-10 and anti-inflammatory IL-13 cytokines showed promising potential as blood-based cytokine biomarkers for AD. This was the first study to report the non-classical cytokine profiles of Malaysian AD patients. Further investigations into the causal effects of both these cytokines in mediating the pathogenesis of AD should be carried out.