A simple and rapid score in differentiating cryptococcal and tuberculous meningitis

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Objectives: Cryptococcal meningitis (CM) and tuberculous meningitis (TBM) are common etiology of CNS infections among HIV-infected individuals. Inaccurate diagnosis and delayed treatment were associated with adverse outcome. Clinical and initial laboratory parameters cannot exclusively differentiated among them. CSF lymphocytic pleocytosis, decreased glucose and increased protein levels can be found in both infections. India ink staining, although simple, rapid and specific, is not very sensitive for cryptococcus. Cryptococcal antigen assay, mycobacterial culture and PCR for MTB detection provide accurate methods for diagnosis, however these tests have several limitations and are not always readily available to many clinical laboratories. The aim of the study were to determine clinical and laboratory parameters and derive a prediction score to differentiate CM and TBM.

Methods: Retrospective study of HIV-infected patients presented with CM and TBM was conducted at Nakhonpathom hospital, a 500-bed tertiary care hospital in central Thailand during January 1, 2011 and September 30, 2013. Predictive factors for CM and TBM were identified by univariate and multivariate analyses and were used to generate the prediction score.

Results: There were 109 patients, 80 (73%) had CM and 29 (27%) had TBM. The mean age was 39.0 ± 10.1 years and 50 (45.9%) were female. Duration of symptoms less than 1 week, low CSF and peripheral leucocyte count were associated with CM. Alteration of consciousness, high CSF protein level, abnormal cranial imaging including hydrocephalus, leptomeningeal enhancement and cerebral infarction were associated with TBM. Multivariate analysis confirmed the associations of duration of illness less than 1 week and low CSF leucocyte count with CM; and the association of abnormal cranial imaging with TBM. Prediction score was calculated from (-8.7 x Duration of illness less than 1 week) + (11.4 x Abnormal cranial imaging) + (-9.8 x CSF WBC below 20) – 4, when 1 used for the presence and 0 for the absence of each factor. Using a cutoff ≥ -4, the sensitivity, specificity, positive predictive value and negative predictive value in predicting TBM were 82.8%, 72.5%, 52.2% and 92.1%, respectively.

Conclusion: CM and TBM present with similar clinical picture. This prediction score provides a high negative predictive value and can be used to rule out TBM.