




Effectiveness of Intravenous Isoniazid and Ethambutol Administration in Patients with Tuberculosis Meningoencephalitis and HIV Infection

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Background: The aim of this study was to investigate the effectiveness of intravenous isoniazid (H) and ethambutol (E) administered in patients with new sputum positive drug-susceptible pulmonary tuberculosis (TB) with tuberculous meningoencephalitis (TM) and human immunodeficiency virus (HIV) co-infection in the intensive phase of treatment.

Methods: Fifty-four patients with TB/TM and HIV co-infection were enrolled for this study. Group 1 comprised of 23 patients treated with E and H intravenously, while rifampicin and pyrazinamide were prescribed orally. Group 2 consisted of 31 patients treated with the first-line anti-TB drugs orally. The concentrations of H and E in blood serum were detected using a chromatographic method.

Results: A significant improvement in the clinical symptoms and X-ray signs in patients treated intravenously with H and E was observed and compared to group 2. The sputum *Mycobacterium tuberculosis* positivity was observed during the second month of the treatment in 25.0% of patients from group 1 and 76.1% of the patients from the control group ($p=0.003$). In addition, nine patients (39.1%) died up to 6 months when H and E were prescribed intravenously compared with 22 (70.9%) in group 2 ($p=0.023$).

Conclusion: In TB/TM with HIV, the intravenous H and E treatment was more effective than oral H and E treatment at 2 months of intensive treatment in sputum conversion as well as in clinical improvement, accompanied by significantly higher mean serum concentrations. In addition, the mortality rate was lower in intravenous H and E treatment compared to oral treatment.

Keywords: Tuberculosis; Tuberculous Meningitis; Human Immunodeficiency Virus; Treatment; Isoniazid; Ethambutol

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