
Poster

[P26-3] P26-3: Central nervous system drugs (2)

Chair: Chiyo Imamura, Japan

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[P26-3-5] Necessity of measurement of serum levetiracetam level in patients with normal renal function for effective medication

Hiroyuki Manshio¹, Itoku Akashi², Hiroshi Yoshida³, Kanoko Hamaishi⁴, Masanobu Ito⁵, Chie Miyamoto⁶, Anri Shinkai⁷, Akemi Oku⁸, Koichi Mori⁹, Takanori Miura¹⁰, Ryoji Kojima¹¹, Akio Katsumi¹² (1.Anjo Kosei Hospital, 2.Meijo University, 3.Anjo Kosei Hospital, 4.Anjo Kosei Hospital, 5.Anjo Kosei Hospital, 6.Anjo Kosei Hospital, 7.Anjo Kosei Hospital, 8.Anjo Kosei Hospital, 9.Anjo Kosei Hospital, 10.Anjo Kosei Hospital, 11.Meijo University, 12.Anjo Kosei Hospital)

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Background

Levetiracetam (LEV) is a novel anti-epileptic drug which is excreted from kidney. Approved LEV dosage in Japan is set based on the simulation analysis using its kinetic parameters obtained from foreign small population. Because the simulation analysis was performed with less consideration of distribution volume, the approved dosage regimen may vary serum LEV concentration in Japanese. In this study we sought a method to determine individualized administration design for safely and effective medication for Japanese.

Methods

Subjects participated in this study were 10 adult inpatients receiving LEV in Anjo kosei hospital from April 2016 to July 2016. LEV was administered according to the criteria of renal function described in the drug package insert. Blood samples were collected just before next LEV administration at a steady state and serum LEV concentration was measured by HPLC-UV. The patients were classified on the bases of creatinine clearance (Ccr). LEV dosage was normalized with body weight as an index of distribution volume. Correlation between LEV dosage (mg/kg body weight) and serum concentration (mg/mL) was analyzed in the each classified group.

Results

The number of patients having Ccr 90 mL/min (group A), 90 >Ccr 60 mL/min (group B), 60 >Ccr 30 mL/min (group C), and 30 mL/min >Ccr (group D) is 4, 5, 1, and 0, respectively. Patients in group B resulted in marked positive correlation [slope of regression line; 1.115, $r = 0.960$] between dosage and serum level of LEV, accompanied with the recommended range (10 to 50 mg/mL). In contrast, serum level in group A remained approx. 10 mg/mL and no correlation was observed.

Conclusions

Serum LEV level in patients with 90 >Ccr 60 mL/min (group B) demonstrated usefulness of the approved dosage regimen. However, the approved dosage regimen failed to obtain the recommended serum LEV level in patients with normal renal function (group A), because of abundant renal excretion of LEV. Thus, in effective medication for patients in group A, it may be necessary to use serum LEV level as a therapeutic indicator, as well as Ccr.