
Poster

[P27-6] P27-6: Clinical toxicology (2)

Chair: David William Kinniburgh, Canada

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[P27-6-4] Qualitative/quantitative analysis and the pharmacokinetic characterization of drug-induced intoxication cases in clinical settings

Motozumi Ando¹, Shinji Nakasako², Marie Niki³, Ryo Tamura⁴, Kenji Sakizono⁵, Akira Inoue⁶, Kazushi Minowa⁷, Koichi Ariyoshi⁸, Shoji Fukushima⁹, Tohru Hashida¹⁰ (1.Kobe Gakuin University, 2.Kobe City Medical Center General Hospital, 3.Kobe City Medical Center General Hospital, 4.Kobe City Medical Center General Hospital, 5.Kobe City Medical Center General Hospital, 6.Kobe City Medical Center General Hospital, 7.Kobe City Medical Center General Hospital, 8.Kobe City Medical Center General Hospital, 9.Kobe Gakuin University, 10.Kobe City Medical Center General Hospital)

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Background

In a year, about 150 patients with drug-induced intoxication are admitted in the emergency department of Kobe City Medical Center General Hospital, and saving their lives is one of our important missions. In such cases, rapid identification of the causative drugs is crucial for the appropriate rescue and treatment. However, patient's awareness is occasionally impaired. Thus, the qualitative/quantitative analysis is considered helpful in identifying the causative drugs. In this study, we have discussed our analytical methods and the intoxication cases experienced.

Methods

Pharmacists, laboratory technicians, and the academic collaborator were engaged in the analysis. For the qualitative/quantitative analysis, GC-MS, LC-MS and LC-MS/MS were used. The individual pharmacokinetic parameters were estimated using the MWPHARM software.

Results

From 2012 to December 2016, we identified the drug or its concentration in serum/tablet of 12 cases with drug-induced intoxication. The most common causatives were circulatory drugs (n=4; amlodipine, efonidipine, atenolol, disopyramide); however, diphenhydramine-/caffeine-induced (each n=2) intoxication cases were also observed. A few cases exhibited fatal or critical drug levels on arrival at the hospital. A caffeine-induced intoxication case exhibited serum caffeine level >130 mg/L (lethal level, 80-100 mg/L), which successfully decreased to around 38 mg/L after hemodialysis. Additionally, in the amitriptyline-induced intoxication case, which was accompanied by the cardiopulmonary arrest, serum amitriptyline level had increased to 1031 ng/mL. However, after 31 hours, it decreased to around 600 ng/mL, and we managed to save the patient's life with dedicated treatment regimen. Based on the Bayesian estimation, the amitriptyline-/diphenhydramine-induced intoxication case demonstrated a reduction in drug clearance by around 40-50% in comparison with the population parameters we referred to.

Conclusions

We support the rescue or treatment of patients with drug-induced intoxication by the qualitative/quantitative analysis. Our experience and accumulation of data on the level of intoxication seem important to reveal the

pharmacokinetic characteristics or develop an appropriate pharmacokinetic model for the drug-induced intoxication case, which may simulate precisely the transition of causative drug and help gain the information about the time to achieve safe level. We hope our approaches contribute to save the lives of patients with drug-induced intoxication.