Regulatory perspective on population pharmacokinetics analysis and exposure-response analysis in drug development and M&S related guidance development in Japan

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Objectives: Pharmaceutical companies have included PopPK, population pharmacokinetics / pharmacodynamic analysis (PopPK/PD) and exposure-response analysis (ER) in their new drug applications (NDAs) to PMDA in recent years. The number of cases where these analyses are discussed in the review is increasing. In this presentation, we’ll show current tendency about PopPK, PopPK/PD and ER in NDAs in Japan. We’ll also introduce the utilization of electronic Study data (e-Study data) in PMDA since we started to receive e-Study data submissions for NDAs in Oct. 2016, and the progress of M&S related guidance development in Japan.

Methods: We summarized the numbers and contents of PopPK and PopPK/PD (including ER) reports submitted to PMDA as a part of NDAs dossier for new molecular entities (NMEs) which approved between 2013 and 2016 in Japan. Then we summarized these analyses according to each disease area.

Results: PopPK and PopPK/PD (including ER) analyses have increased in the past few years. PopPK was included in about 50% of the NDAs, and PopPK/PD (including ER) was included in about 50% of PopPK. The disease areas where these analyses were included most frequently were anticancer drugs, followed by drugs for metabolic diseases and antibiotics, viruses and fungi in that order. Some cases will be introduced in our presentation.

Conclusions: PopPK and PopPK/PD (including ER) are increasing in Japan. Furthermore, we started to receive and utilize e-Study data for NDA review. The data will be accumulated in our database. Then we will conduct cross-product analyses such as disease model establishment and so on. On the other hand, we have been developing guidelines regarding Modeling & Simulation in Japan, and it is expected that these guideline will further increase PopPK and PopPK/PD (including ER) to enhance drug development in Japan.