**Effect of Age and Gender on the Pharmacokinetics of Oral and IV Omadacycline, A New Class of Aminomethylcyclines**

S. Ken Tanaka, PhD; Evan Iiznatis; Stephen Villano, MD

Paratek Pharmaceuticals, King of Prussia, Pennsylvania, USA

**ABSTRACT**

Omadacycline is a fully oral, broad-spectrum aminomethylcycline class, which demonstrated safety and tolerability in clinical trials. However the effect of age and gender on the pharmacokinetics of omadacycline is unknown. Aims: To evaluate the effect of age and gender on the pharmacokinetics of oral (PO) and intravenous (IV) omadacycline after single dose administration. Methods: Both were double-blind, placebo-controlled, randomized studies of single and doses of omadacycline to subjects administered at 0.5 to 3.2 g in am慢性cycline studies. Study I (23 subjects) was a single-dose study for safety and tolerability of single doses of 0.5 to 3.2 g of omadacycline or placebo. Blood samples were obtained pre-dose, and 0.5, 1, 1.5, 2, 3, 4, 6, 8, 12, 18, 24, 48, 72, and 96 hours post-dose to determine plasma concentrations of omadacycline. Study 2 (22 subjects) included 4 subject groups: A) young males; B) young females; C) elderly males; D) elderly females. Blood samples were obtained on day 1 for a high degree of consistency was observed for the PK characteristics of a single 200 mg oral dose. No significant difference in drug exposure was observed between young and elderly subjects. After a single oral administration of 200 mg of omadacycline, female subjects exhibited greater mean AUCmax and AUCinf than corresponding young and elderly male subjects (Table 3). Conclusion: After a single oral administration of 200 mg of omadacycline, female subjects demonstrated higher AUCmax and AUCinf compared to male subjects. However, the exposure in elderly subjects was similar to that in young subjects. There was no dosage adjustment on the basis of patient age or gender necessary.

**RESULTS**

**INTRODUCTION**

Aminomethylcyclines are fully oral, broad-spectrum antibacterials that are active against Gram-positive and Gram-negative bacterial pathogens, including methicillin-resistant Staphylococcus aureus and vancomycin-resistant Enterococcus faecium. Omadacycline is also active against Gram-positive (both penicillin-susceptible and penicillin-resistant) and Gram-negative bacteria, including Proteus mirabilis. The novel aminomethylcyclines are active against drug-resistant and drug-resistant regular strains, anaerobes, and fungi. Omadacycline (Paratek) has been reported to have a high rate of clinical success: 80% for patients with acute skin and skin structure infections (cSSTIs) and 79% for patients with community-acquired pneumonia (CAP). The active PK ingredients are at least 30% higher among females vs. males in both age groups. In summary, no dosage adjustment of omadacycline is required based on patient age or gender.

**METHODS**

Study 1 was a double-blind, placebo-controlled randomized study to evaluate the effect of age and gender on the pharmacokinetics of ammoxacyclin after single dose administration.

**Safety and Tolerability**

No serious AEs were reported in either study. No clinically relevant changes in vital signs, laboratory findings or ECGs were observed in either study.

**SUMMARY AND CONCLUSIONS**

- After administration of single doses of ammoxacyclin 200 mg and 100 mg in female subjects, there was no significant difference in plasma exposure or half-life of drug, although there were differences in AUCmax among various age groups.
- The magnitude of the differences were not clinically significant given the safety profile of ammoxacyclin observed in this study and existing body of clinical data in the development program.
- The effect of age and gender on the aminomethylcycline absorption in clinical profile was observed.
- Single doses of ammoxacyclin in select ionization. Formulations were well tolerated. The most common side effects were GI events, which were similar to those observed with amoxicillin.
- A summary of additional adjustment of ammoxacyclin is required based on patient age or gender.

**References**