COST-EFFECTIVENESS ANALYSIS OF OSELTAMIVIR FOR INFLUENZA IN JAPAN: MODELING IN THE VIRUS EMERGING RESISTANT TO THE DRUG

Nagase H1, Kamae M2, Moriwaki K3, Yanagisawa S2, Kamae I4
1Kobe University School of Medicine, Kobe, Hyogo-ken, Japan, 2Tufs-NEMC, USA, Boston, MA, USA, 3Kobe University Graduate School of Medicine, Kobe, Hyogo-ken, Japan, 4Kobe University Graduate School of Medicine, Kobe, Hyogo-ken, Japan.

OBJECTIVES: Oseltamivir has been stockpiled for emerging threat by new influenza pandemic. Recent studies report what possibility of the virus emerging resistant to oseltamivir. The purpose of this study is to evaluate the cost-effectiveness of oseltamivir for influenza in Japan with considering the complications and the emergence of oseltamivir-resistant virus.

METHODS: A cost-effectiveness analysis was performed by decision tree using evidence from the Japanese clinical trial and the NICE, UK, systematic reviews. The decision tree models a patient presenting with influenza likely illness and facing the alternative treatments: rapid diagnostic testing followed by treatment with oseltamivir or a comparator which goes with conventional treatments. The decision tree visualized morbidity and mortality with complications such as ill states needed for antibiotics and hospitalization due to pneumonia. The analysis included assessment of not only direct medical costs but also productivity loss. Costs were derived from published literature and the statistics in DPC (Diagnosis Procedure Combination) system in Japan.

RESULTS: Considering the productivity loss during influenza and complications, oseltamivir cost JPY150,703, and the comparator, JPY163,415 per QALY. When the prevalence was in the low range of 10% through 40%, the dominance of oseltamivir vanished. The incremental cost-effectiveness ratio (ICER) of oseltamivir versus comparator was JPY398,571 per QALY. Considering the productivity loss, however, the ICER for oseltamivir turned to be negative, simple dominant, JPY2,345,714 per QALY. Regarding the virus emerging resistant to the drug, we found the dominance of oseltamivir vanish if the emerging rate becomes more than 27%. Sensitivity analysis also suggested that the emerging rate of the drug-resistant virus was more sensitive in the influenza peri-season (prevalence: 40–60%).

CONCLUSION: The use of oseltamivir for influenza was so far recommended as cost-effectiveness in Japan. However, the advantage of oseltamivir is affected by both the prevalence and emerging rate of the oseltamivir-resistant virus.