Aim: Malignant pleural mesothelioma (MPM) is a rare and usually fatal cancer of the pleura. The lack of effective treatments for MPM urges the development of new therapeutic approaches. The use of oncolytic herpes simplex virus type 1 (HSV-1) has been shown to be an effective therapeutic approach for a variety of cancer in preclinical models. A third generation oncolytic HSV-1, G47Δ, is currently used in multiple clinical trials in Japan with promising results. In this study, we investigated the potential of G47A as a new therapeutic modality for MPM.

Methods: Human malignant mesothelioma cell lines MSTO-211H, NCI-H226, NCI-H2052, NCI-H2452 and NCI-H28 were used. Infectivity and cytopathic effects of G47Δ on mesothelioma cell lines were assayed in vitro. Viral replication was determined by standard viral plaque assay. Orthotopic MPM xenografts were generated in athymic mice, treated with intrapleural G47A, and survival was assessed.

Results: Most of the cell lines were susceptible to G47Δ irrespective of histological types, although NCI-H28 was slightly less sensitive. Viral replication assay resulted in approximately a 200-fold increase in virus titer by 48 h. In orthotopic MPM xenograft models, intrapleural inoculations with G47Δ significantly prolonged the survival time.

Conclusions: Oncolytic HSV-1 G47A was effective in MPM cell lines. These findings suggest that G47Δ may be a potent therapeutic modality for MPM.

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