Comparison of the efficacy of post exposure smallpox vaccination versus antiviral treatment with acyclic nucleotides against monkeypox virus infection

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Following a worldwide vaccination program the World Health Organization (WHO) declared smallpox to be eradicated in May 1980. Soon thereafter, general vaccination against smallpox was discontinued. Variola virus, the etiological agent of smallpox, is now ranked high on the list of biological agents that may be used as a bioweapon because infection with this virus results in approximately 30% mortality and to date the vast majority of the population lacks protective immunity. In addition, there are growing concerns from the observation that other mammalian poxviruses, like cowpox virus and monkeypox virus (MPXV), may now cross the species barrier to humans more easily. Several countries are now stockpiling smallpox vaccine, but the use of classical smallpox vaccines is associated with serious adverse events and current plans do not envisage mass vaccination with traditional smallpox vaccines until after an outbreak has been detected. Efficacy testing of new intervention strategies in experimental animals, in comparison with the use of traditional smallpox vaccines, will form an essential part of the data required to register new intervention strategies against smallpox. To this end animal models that mimic the natural infection of variola virus in humans are particularly important. MPXV infection of macaques resembles smallpox and this model can be used for the evaluation of new candidate smallpox vaccines such as modified vaccinia virus Ankara (Stittelaar et al. 2005 J. Virol. 79:7845-51). Recently we directly compared the efficacy of post exposure smallpox vaccination versus that of antiviral treatment with acyclic nucleotides in the same macaque-MPXV model. The results will be presented and the possible impact on post-exposure treatment will be discussed.