

Measles vaccination: Threat from related veterinary viruses and need for continued vaccination post measles eradication

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Measles virus (MV) is the only human virus within the morbillivirus genus of the Paramyxoviridae. The virus can cause severe complications such as measles giant cell pneumonia and acute post measles encephalitis. More rarely fatal infections of the CNS, sub-acute sclerosing panencephalitis (SSPE) and in immunosuppressed individuals measles inclusion body encephalitis (MIBE) occur. The World Health Organization (WHO) has set goals towards the complete eradication of MV in at least five WHO regions by 2020. This presents potential problems as the closely related veterinary members in the genus share common cell entry receptors raising the risk of zoonotic infection. MV is thought to have evolved from the eradicated cattle morbillivirus, rinderpest, and to have entered the human population during cattle domestication. Lessons have also been learned from other animal to human virus transmission

i.e. human immunodeficiency virus (HIV) and more recently avian influenza, severe acute respiratory syndrome (SARS) and Middle Eastern Respiratory Syndrome (MERS). This highlights the potential consequences of complete withdrawal of MV vaccination after eradication. The measles vaccine is live attenuated and has very low risk of reversion but is still unlikely to be acceptable in a MV free world raising the need for alternative approaches. A formalin fixed MV vaccine was used for a period in the 1960's but provided short lived and non-complete immunity with an altered immune response and death of some children following later infection. This has encouraged research into recombinant vaccines for MV or the closely related veterinary viruses using other virus vector systems.

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