

or individuals believe that the risk of vaccination outweighs the potential benefit of protecting themselves from accidental exposure which will result in an infection. Meanwhile, information also shows that the symptoms of unvaccinated individuals are relatively mild in cases of laboratory infections and need no hospital care. Some data indicate that vaccination on the first day of exposure to vaccinia virus can reduce symptoms or prevent the disease. However, once vaccinia virus is frequently used in laboratories, and laboratory-acquired vaccinia virus infections still exist, appropriate countermeasures should thus be taken and implemented, and the positive role of immunization in control of laboratory infections should be considered.

Screening Staff with Contraindications Graduates who are currently engaged in laboratory studies are mostly born after 1980, and have never been vaccinated. Epidemiological surveys have confirmed that primary immunization usually leads to severer adverse reactions, and strict screening should therefore be carried out during primary immunization so as to screen people affected with eczema, atopic dermatitis, immunodeficiency and other high-risk populations to avoid the occurrence of serious adverse reactions. Health surveillance, infection control, and timely vaccination are the preferable measures to alleviate their symptoms. Patients with contraindications or in poor health should be transferred from their current posts.

Adjustment of Vaccination Strategies Non-replicative vaccinia virus vectors can improve the vaccinia virus vector immune effectiveness and reduce its virulence, thus providing a new solution for the vaccinia application. MVA is a kind of replication-defective smallpox vaccine, which is derived from vaccinia virus Ankara strain. MVA reduces the virulence and side reactions of the virus by maintaining its biological characteristics. However, its titer is not high and large doses of the vaccine need to be administered. Primary immunization of MVA, followed by inoculation of the first generation vaccine, can obviously alleviate skin reactions. It was reported that MVA, combined with the first generation of vaccine, could improve the effect of immunity and reduce the adverse reactions, supporting that MVA could be used as a vaccine in the general population to improve their immunity to orthopoxvirus^[22].

Development of New Vaccines From the first generation vaccines produced from bovine lymphoid

tissue, to the second generation vaccines prepared in cell culture, the natural passage attenuated third generation vaccines, and the ongoing genetically engineered highly attenuated vaccines, research staff have been looking for a new generation vaccine which can maintain the immunogenicity and reduce the side effects. The reduced side effects of new vaccines will promote the vaccination in laboratory staff^[11].

Vaccine-preventable diseases refer to certain human infectious diseases that can be prevented by vaccination or immunization. Vaccine immunization can prevent such diseases, improve the immunity of the population, reduce the susceptibility of the population to pathogens, cut off the transmission and eliminate the source of infection. With the immunization strategies for vaccine-preventable diseases, some infectious diseases have been effectively controlled, or even eliminated, such as smallpox and polio. Since viruses will be widely present in laboratory conditions, research needs to be going on, the laboratory has become the major target of infection and the main source of biorisk. Therefore, it is increasingly important to control the transmission of laboratory-acquired vaccine-preventable infectious diseases outside of the laboratory. Regulations on Pathogenic Microorganisms Laboratory Biosafety have been available and more attention has been paid to biosafety and laboratory-acquired infections in China since 2004^[21]. Referring to related US or European practices, measures should be taken for the prevention and control of laboratory infections and the elimination of the risk of transmission derived from laboratory exposure.

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