SAGE Consultation on Smallpox Vaccines
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Findings and Recommendations

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the SAGE Consultation on Smallpox Vaccines Group

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SAGE Question 1

Once vaccination has been decided:

Which vaccine should be recommended to be used during an outbreak of smallpox? (vaccine used during the eradication, vaccine produced in tissue cell, or further attenuated vaccines).

- Composition of stockpile
- Size of stockpile
- Should we consider different scenarios of risk?

SAGE Question 1

Findings

1. Two strains were most frequently used during the eradication, the New York Board of health (NYCBH) strain and the Lister strain, although other strains were also used.

2. The eradication program was aided by the introduction of the bifurcated needle as a simple and effective way to do vaccinations.

3. The vaccines used during the eradication program sometimes produced significant adverse reactions, some of witch were occasionally fatal.

SAGE Question 1

Findings (cont.)

4. The vaccines used during the 1960s and 1970s were produced on the skin of live animals and yielded virus laden lymph that contained some bacterial contaminants.

5. Vaccines in recent years have been produced in cell culture under current Good Manufacturing Practice (cGMP) standard.

6. Vaccines candidates that are genetically modified are thought of as further attenuated or non-replicating vaccines.

SAGE Question 1

Composition of stockpile recommendations:

1. Vaccines proposed for actual use against smallpox should be lyophilized and be administered via bifurcated needles and produce a visible major cutaneous reaction (i.e “take”).

2. In controlling an outbreak, countries should use any smallpox vaccine on hand that meets WHO/TRS No 926. 2004 standards of potency, purity, and stability.

3. Additional vaccine donations should be considered, as well as funds that could be used to manage the stockpile and purchase additional vaccines.

SAGE Question 1

Composition of stockpile recommendations (cont.)

4. For new donations to WHO stockpile, both licensed ACAM2000 and LC16m8 should be accepted, as vaccines used during the eradication (lymph, skin from animals) are no longer actively produced.

5. Countries donating vaccines to WHO stockpile should provide same vaccine as they have in country stockpile.

6. Vaccines donated should be bundled with bifurcated needles, lyophilize, and produce a major cutaneous reaction after administration with the bifurcated needles.

Size of stockpile

- The group could not make a recommendation on the number of doses needed in the stockpile
- Factors to be considered in estimating the size of stockpile include:

- cause of re-emergence (natural, bioterrorism)
- location of initial emergence (urban, rural, mass-gathering event…)
- population density & movement
- vaccine production capacity

- Further analysis (consultation) needed for better estimate of number for the stockpile.

SAGE Question 2

Once vaccination is decided, what other groups should be prioritized to be vaccinated while faced with limited vaccine supply?

- Age groups, risk factors/safety aspects, vulnerable populations, ethical considerations
- Which vaccine should be given?

SAGE Question 2

Findings:

1. Transmission of smallpox generally required face-to-face contact with visibility sick individual with rash.
2. Patients are not infectious during the febrile prodrome.
3. Once the rash appears virus is shed from the upper respiratory tract and the patient becomes infectious.

SAGE Question 2

Findings (cont.)

4. Strict isolation of patients, couples with vaccination of the small numbers of contacts who attended the patient during the infectious period, quickly eliminated outbreaks.

5. Primary vaccination within 3-4 days of contact generally prevented development of the diseas.

SAGE Question 2

Recommendations

1. First responders who have direct contact with symptomatic patients (ambulance staff, emergency workers, health care staff)

2. Laboratory workers expecting to have direct contact with specimen collection and/or processing.

3. Vaccines used should WHO/TRS no. 926, 2004 standards for potency and stability, and be capable of producing a major cutaneous reaction following a single dose administration.

4. Vaccine available locally similar to those used during the eradication campaign are acceptable, as are ACAM200 and LC16m8.

SAGE Question 3

Which vaccine should be recommended for preventive use?

What would be the immunization schedule? (First aid responders, army, police, health workers)

SAGE Question 3

Recommendations

1. Based on a risk-benefit ratio, and the low risk for reappearance of smallpox, preventive vaccination should be limited to lab personnel working with orthopoxviruses

2. Each country should decide what vaccine to use; however the vaccine to be used should be a well established vaccine meeting WHO recommendations (Technical Report Series, No. 926, 2004)

3. There is no enough scientific evidence to provide any recommendation on the need and frequency of booster immunizations

SAGE Question 3

Recommendations (cont.)

4. Imvanex MVA: More clinical data on its efficacy and safety should be produced before any recommendation can be given

5. In countries where the vaccine is licensed, for individuals who refuse to be vaccinated with replicating live vaccines or have been designated as “high risk, and have been medically excluded from receiving standard replicating vaccine because of pre-existing immune deficiencies, immunosuppression, atopic dermatitis, etc. the MVA-BN is likely to be safer than replicating vaccines