

STUDY OF CONDITIONS FOR TRANSPORTATION OF VACCINES

Dats'ko Ya. N., Demyanenko V. G.

National University of Pharmacy, Kharkiv, Ukraine

aeial@mail.ru

Introduction. Medicinal immunobiological preparations and, in particular, vaccines, serums, anatoxin, antigens, etc., should be transported under temperature from +2 to +8 °C. Great range of different equipment and system types has been developed for their transportation and storage. There are a lot of manuals and guidelines concerning their proper use, because it's very responsible process. Transporting, storage and handling errors can cost thousands of dollars in wasted vaccine and need for revaccination. Errors can also result in the loss of patient confidence when repeat doses are required

Aim. The objective of the present article is study of conditions for transportation of immunobiological preparations, in particular vaccines, in cold chain system.

Materials and methods. In the present study different information data sources including normative documentation concerning principles and methods of transportation of immunobiological preparations have been analyzed.

Results and discussion. To maintain appropriate storage and transportation conditions for vaccines from manufacturer to medical or pharmaceutical institutions there should be used cold chain system consisting of:

- personnel providing medical aid and refrigerating machinery services;
- procedures used to control distribution and use of vaccines;
- equipment itself which should conform the requirements for safe storage eliminating dependence on environment and various surrounding factors.

In every equipment for cold chain various refrigerants are used: recently – CFC-containing freons which unfortunately are harmful for environment, and now – HCFC, HFC - gases which are ecologically harmless.

To protect vaccines one should use thermocontainers and portable transferring bags where special cards-indicators & freeze indicators are placed into, providing necessary control over regimens of transportation.

Thermocontainers as well as transferring bags have a cover tightly closing them, and also they have heat-insulating properties, the difference is only in that transferring bag is much less in its sizes.

Charging of thermocontainers with preparations is carried out in fridge storage rooms (premises for vaccine storage) or under exceptional situations at ambient temperature if duration of charging does not exceed 10 minutes.

Thermocontainer is placed into cardboard box which prevents its damage. Onto

a box for vaccines, anatoxins, tubercular allergen which do not allow freezing a label with inscriptions “Vaccine! Urgent cargo”, “Do not freeze” is attached.

There are 4 levels of cold chain.

On the 1st and 2nd levels of transportation of immunobiological preparations from a manufacturer to a wholesale storage warehouse on large distances during 1–3 days it’s necessary to use refrigerator transport vehicles with temperature from +2 to +8°C.

On the 2nd level an authorized person should have coordinated supply schedule of immunobiological preparations to the 3rd level and should supervise their remaining shelf-life which should be not less than 1 month at the moment of shipment.

Transporting from the 3rd to the 4th level (to treatment-prophylactic establishments) is carried out in thermocontainers.

At obtaining of vaccines, anatoxins, tubercular allergen they should be immediately placed into refrigerating machinery and indications of control means should be checked.

Important parameter during transportation and storage of immunobiological preparations is duration of cold preservation inside equipment which is defined by time during which this equipment preserves temperature not above +10 °C.

There are some factors which this time depends on:

- type of a portable transferring bag, materials of which it is produced, thickness of its walls;
- temperature under which a cooling element has been placed into a container, and also weight of a vaccine;
- exposure time when a container was kept opened;
- environment, namely air temperature.

The complete set of the equipment for transportation of immunobiological preparations includes refrigerating elements (packets). They look as rectangular plastic containers filled with usual water.

The WHO recommends to use two types of cooling packets:

- 0.4 l (for portable transferring bags);
- 0.6 l (for thermocontainers).

For temperature maintenance within range from 0 to +8 °C also such frozen cooling packets are used.

During transportation in deep-freezer it’s necessary to keep the second complete set of refrigerating elements and while the first complete set is used, the second one should be kept in frozen state.

Conclusion. Vaccines must be transported and stored properly under cold chain from the time they are manufactured until they are administered.