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Review Article

**A REVIEW ON PROSPECTIVE OBSERVATIONAL STUDY ON
THE AVAILABILITY AND STORAGE OF VACCINES IN THE
COMMUNITY PHARMACIES AT PARASSALA****Ms. Ancy A.B*, Mrs. Shibina Najeem*, Ms. Simchu R.B*, Arsha Anand*,
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Abstract:

Vaccines are preparations that are used to stimulate the body's immune response against diseases. Vaccines are usually administered through needle injections, but some can be administered by mouth or sprayed into the nose. The storage of vaccines must be done properly in order to maintain its therapeutic efficacy as well as safety. Adequate storage facilities like refrigerator and temperature maintenance must be established. . By getting vaccinated, we can protect ourself and also avoid spreading preventable diseases to other people in our community. Disease burden due to vaccine preventable diseases is high. These diseases cause premature death, disability and malnutrition in young children. These vaccine preventable diseases can be prevented by vaccination and immunization.

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INTRODUCTION:

Pharmacy is the science and practice of discovering, manufacturing, dispensing, reviewing and monitoring of medications in order to ensure the safe, effective and affordable use of medications. Pharmacy serves as connection between all the health science, pharmaceutical science and natural science. The professional practice is now becoming more clinically oriented. The pharmacy practice can be classified as community or institutional pharmacy or clinical pharmacy. The pillar of a pharmacy is the pharmacist, who has a bunch of responsibilities. Pharmacists are responsible for the preparation of dosage forms of the drugs, such as tablets, capsules and sterile solutions for injection.

A health care system without medicines seems unthinkable given that they are one of the most important tools we have to prevent illness and improve health. However, a lack of consistent access to medicines, poor quality of medicines and improper use are the main problems in many countries around the world. Having an understanding of why these issues happen and how to prevent and manage them is critical. Appropriate use of medicines in the pharmacy department is a multidisciplinary responsibility under the supervision of a qualified pharmacist and includes procurement, storage, preparation, and dispensing. The main responsibilities of a pharmacist include compounding and dispensing medicines and providing counselling to the patients. Proper procurement, storage, dispensing, and documentation of medicines are important aspects of pharmacy management. Large amounts of medicines are wasted during procurement, storage, distribution, and utilization. A pharmacy in India should maintain and follow standard operating procedures. A good dispensing environment is an important part of day-to-day pharmacy practice and includes staff, physical surroundings, and equipment. Most medical products are for internal use and require a clean, hygienic, and organized dispensing environment to prevent contamination. Proper environmental controls such as temperature, light, humidity, conditions of sanitation, ventilation, and segregation must be maintained, along with warehouses offering sufficient storage space. Warehouses should have sufficient storage space along with the necessary facilities to handle medicines efficiently and as per the guidelines. Storage must be secure, and fixtures and equipment used to store medicines should be constructed in such a way that medicines are accessible only to designated and authorized personnel. Such personnel must be carefully selected. Safety is an important factor, and proper considerations should be given to the safe storage of poisons (disinfectants or other chemicals

not meant for human use) and inflammable compounds. A pharmacy should have all the necessary equipment required for good drug-dispensing practices.

The pharmaceuticals are to be stored under conditions that prevent contamination and deterioration. The stability of product retains within the specified limit, throughout its period of storage and use. Precautions that should be taken in relation to the effects of the atmosphere, moisture, heat and light are indicated. Storage of the pharmaceutical products is one of the fundamental concerns in patient care. The conditions under which pharmaceutical products are manufactured and stored can have a major impact on their quality. High temperature and relative humidity (RH) are the most important factors involved in drug degradation. Factors such as temperature, humidity, air quality, time and production process characteristics can all have a significant impact on the final quality, and therefore the sale ability, of a product or batch of products. For many products requiring storage in cool conditions, refrigeration plant is widely used, which needs to be carefully monitored to ensure that the correct temperatures are maintained. Stock must be stored in appropriate and auditable environmental conditions.

Cold Chain:

Drugs like vaccines and other biological preparations lose their potency quickly if stored or kept under high temperatures for some time. Such drugs often cause problems at the time of transportation from one place to another as in the case of supply from the manufacturing premises to the consumers or hospitals or dealers in a faraway place. This is a serious problem in the case of tropical countries like India where high ambient temperature are very common. The cold chain is an arrangement used to protect the temperature sensitive drugs from the exposure to atmospheric temperature during transportation from one place to another. The cold chain from the point of view of drug storage represents the arrangement of facilities used to keep drugs at low temperatures from the manufactures end to the uses end. Such cold chain systems are in operation in countries like India, Bangladesh, Burma, Indonesia, Liberia, Pakistan, Philippines, Thailand, Uganda and several South American countries. Organizations like WHO, UNICEF etc. help the countries to install and improve cold chain facilities by encouraging them to develop a wide range of cold chain equipment suited to the needs of the countries.

An effective system of temperature monitoring and recording is vital for the cold chain in order to minimize failure of cooling. Commonly used

temperatures monitoring equipment's in cold chain consists of thermometers like two channel clockwork temperature recorders with alarm switching for use in cold rooms, dial thermometers with maximum pointer and alarm switching for use in large vaccine refrigerators or freezer and dial thermometers with maximum or minimum pointer for use in vaccine refrigerators or freezers located in peripheral areas. The 2-channel clockwork temperature recorder with alarm and dial thermometer with maximum pointer and alarm are developed specifically for use in tropical climates and for area with intermittent electrical supply. The UNICEF warehouses use the dial thermometers with maximum or minimum pointer. Vaccines deteriorate at a rate determined by both time and temperature. It is therefore important to have some record of the handling history off any given package. Time temperature tags are used to monitor the standard of vaccine handling during the process of transportation to the peripheral areas where vaccine is used.

Electricity failures and fluctuating voltages are common features of electricity supplies in many developing countries and these factors in addition to tropical conditions, often lead to high internal temperatures in front of opening domestic refrigerators. The frequent voltage fluctuations damage the compressors and shorten its working life. Above all, the standard of construction of domestic refrigerators is less than adequate to provide a controlled temperature between 4°C and 8°C required for vaccine storage in tropical climates. Commercial chest freezers converted to act as vaccine refrigerators have the advantage like better insulation, smaller temperature difference in the storage area. Better configuration of space for storage of vaccine packages and less escape of cold air through the top opening. Suitably designed chest freezers can keep the vaccine cool over considerable period when the current fails or voltages are low. Tests have shown that when ambient temperatures are held at 43°C, vaccine storage temperatures can be maintained with only 8 hours of electric supply in each 24-hour cycle. The power consumed in a 24-hour period per unit volume in stores is lower than that of standard domestic refrigerator and security for vaccine stored is enormously increased.

Vaccine refrigerator, which can operate without electricity, are also used in 'cold chain'. Performance tests on front opening refrigerators opening on kerosene have shown that such refrigerators are useful if the ambient temperature is below 40°C. Units operating on liquid propane gas are easier to manage and more reliable. They require less maintenance, but supply of gas cannot always be relied upon. Solar

refrigerators and icepack freezers are also in use. Portable refrigerator equipment like Peltier effective refrigerator or freezer, rotatory type compressor refrigerator, swing type compressor freezer, absorption type refrigerator, etc. are also used in the cold chain. They usually have a capacity ranging from 5 to 30 liter manufactured mainly for camping market.

Portable equipment's are used for static storage of small quantities of vaccines, glandular preparations like insulin and similar items. And for transport of such drugs over long distances in vehicles. Cold boxes for transport of vaccines between stores and vaccine carriers are also used in cold chain establishment.

The vaccine carriers are light, robust and relatively low in cost and have a cold life of about 36 hours at outside temperature up to 43°C. They usually have a capacity of 1.5 liters. Ice and ice packs are constantly needed for cooling insulated vaccine container of all kinds and for storing and transporting vaccines in rural areas. Absorption type domestic refrigerators in areas without electricity make ice with great difficulty and very slow rate. In the late 1970s, UK developed icemakers, which can easily overcome this problem.

The maintenance of vaccines, glandular drugs like insulin, at a safe storage temperature during transport from manufacturer to user destination depend on the standard of the insulated packing used. In practice, standards vary widely and many vaccines, insulin preparations and similar drugs are transported with an insufficient safety marketing to guard against possible delays. The manufacturer should inform the receiving parties well in advance about the arrival of the drugs that require cold storage, so that they can make suitable arrangements to take delivery of the consignment immediately on reaching the station. The cold chain arrangements are essential for the proper transport and storage of drugs like vaccine and biological products in order to protect their potency and ensure their quality.

STUDY PROJECT:

The duration of study is for 6 months.

STUDY SITE:

It is the study conducted in community pharmacies in and around Parassala.

STUDY DESIGN:

This is a community based prospective observational study where the pharmacist in the community where interviewed the adequate storage facilities where inspected and data was collected and data analysis will be done.

DATA COLLECTION TOOLS:

Questionnaire to collect information from various pharmacies.

CONCLUSION:

Vaccines are preparations that are used to stimulate the body's immune response against diseases. Vaccines are usually administered through needle injections, but some can be administered by mouth or sprayed into the nose. Vaccines help our body to create protective antibodies. By getting vaccinated, we can protect ourself and also avoid spreading preventable diseases to other people in our community. Disease burden due to vaccine preventable diseases is high. These diseases cause premature death, disability and malnutrition in young children. These vaccine preventable diseases can be prevented by vaccination and immunization.

In our study we demonstrate about the availability and storage of vaccines in community pharmacies. The storage of vaccines is important, because improper storage can lead to contamination as well as attack by microbes. Most convenient way of storage for vaccines are in refrigerators. Maintenance of cold chain is an essential factor during the storage of vaccines. Vaccines should be stored in refrigerators at 2 to 8°C.

In our study demonstrated that 24 samples are selected randomly from the accessible pharmacies from the Trivandrum district and the information's are collected from that pharmacies. From the data collected it was analysed that the distribution of air conditioner facilities is only 33%. The availability of cold chain maintained in various pharmacies is found to be 83%. According to the analysis from 24 pharmacies, majority of the pharmacies contain one pharmacist which is followed by two, three and four. From the study it was found out that out of 24 pharmacies 75% of pharmacist were qualified as D pharm, 17% were qualified by both D pharm and B pharm and 8% were qualified by both B pharm and M pharm. According to the study it was found that out of 24 pharmacies the refrigerator facilities including the maintenance of temperature {2 to 8°C} are followed by all of them {100%}.

From our study we observed that adequate storage facilities must be available in pharmacies for vaccine storage. Negligence in the storage of vaccines may lead to its contamination which may further affects its efficacy as well as safety. Contaminated vaccines lack

potency which may affect its therapeutic efficacy. Maintenance of cold chain is an important factor during the storage and dispensing of vaccines. Vaccines are one of the powerful tool that is essential to control the disease to a greater extent. Most of the life-threatening diseases were eradicated by the discovery of various vaccines. Vaccines are the lifesaving factor in most of the pandemic conditions. The impact that does by the vaccines are irreplaceable in this current scenario.

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