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Drug Storage Conditions in Different Hospitals in Lahore

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Abstract

The study was carried out on Comparison of drug storage condition at different hospital in Lahore. Rural health centers and District health centers in Bahawal Nagar. The basic objectives were to study the stability compatible storage proper control storage in terms of temperature, light, humidity, sanitation and ventilation conditions, and compatible with stability of stored product must always be maintained. These conditions are needed to ensure maintenance of the stored product for their shelf lives. Secure storage, safe storage is the important factor and proper consideration should be given to the safe storage of poisons and flammable compounds. Segregate storage, good storage practices, and significance of storage conditions in main store, sub store, satellite pharmacy, Opd and emergency. Temperature controlled storage facilities refrigerator(usually 2°to 8°C), cold place(temperature not exceeding 8°C) , Cool place(8°C to 15°C,) , Room temperature(15°C to 30°), Cold room(12°C to 15°C). Storage of controlled narcotics, vaccines. Drug procurement, drug distribution, inventory control, manufacturing of bulk and sterile, cleanup area quarantine storage area. Storage of TPN solution recommended being stored at 2-8°C, storage of cytotoxic agent. Role of pharmacist in maintenance of storage conditions in a hospital. Storage conditions are very significant because drugs are chemicals that react to external stimulants such as heat, moisture, light, dust, etc. In many cases, such reaction leads only to superficial changes, such as discoloration. In many other cases, the reaction may affect the drug more seriously, leading to reduction or elimination of its efficacy and/or potency. There are cases of drugs that, thus affected, not only exert no healing effect but also cause adverse effects on the patient's health; Storage therefore must not be taken lightly. It is always a good practice to read storage instructions printed on the container or strips in which the medicine comes.

Key words. Segregate storage, Room temperature, Cool place, secure storage,

INTRODUCTION

Exposure of medicines to high temperatures in storage or in transit could reduce their efficacy, and most licenses specify storage at 25°C or less. To assess whether this criterion was being met, maximum temperatures in a general practice drug cupboard and in drug bags placed in car boots were recorded for two weeks during a British heat wave (average peak daily ambient temperature 26°C). Also, ten neighboring dispensing pharmacies were questioned about their temperature-control policies. None of the local dispensaries had air conditioning or kept a temperature log. In the course of a British summer, medicines were exposed to temperatures that might in theory have reduced their efficacy. This aspect of quality control deserves more attention.(Sriramakamal Jonnalagadda, et al(2000)

The effect of storage at relatively high temperature and humidity on tablets prepared from different bases was studied for up to eight weeks. Drug release from tablets was followed by measuring the concentration of a marker (amaranth) in the dissolution medium. Lactose and mannitol based tablets showed an increase in hardness and disintegration time, and a decrease in the initial rate of drug release. Sorbitc based tablets, stored under 50°C/50% relative humidity (R.H.), showed a decrease in hardness and slower disintegration and dissolution. When stored under 40°C/90% R.H., the tablets were completely deformed within three days . Tricalcium phosphate and cellulose-based tablets did not show any storage related changes in hardness, disintegration or drug release.
(Nigel B. Perry,et al (2001)

A temperature maintained thermostatically that encompasses the usual and customary working environment of 20° to 25°C (68° to 77° F); that results in a mean kinetic temperature calculated to be not more than 25°C ; and that allows for excursions between 15° and 30°C (59° and 86°F) that are experienced in pharmacies , hospitals, and warehouses. Provided the mean kinetic temperature remains in the allowed range, transient spikes up to 40°C are permitted as long as they do not exceed 24 hours. Spikes above 40°C may be permitted if the manufacturer so instructs. Articles may be labeled for storage at "controlled room temperature" or at "up to 25°C ", or other wording based on the same mean kinetic temperature. The mean kinetic temperature is a calculated value that may be used as an isothermal storage temperature that simulates the non-isothermal effects of storage temperature variations. Controlled Cold Temperature (CCT) as: This temperature is defined as the temperature maintained thermostatically between 2° and 8°C (36° and 46°F), that allows for excursions in temperature between 0° and 15°C (32° and 59°F) that may be experienced during storage, shipping, and distribution such that the allowable calculated MKT is not more than 8°C (46°F). (Jeffrey Hofer, et al 2006)

Light can change the properties of different materials and products, and the number of drugs found to be photochemically unstable is steadily increasing. We define "photosensitivity" as the response that a compound shows to light exposure and includes not only degradation reactions, but also other processes, such as the formation of radicals, energy transfer, and luminescence. Most are familiar with the traditional brown medicinal flask or the white pillbox; these offer adequate protection for most drug products during storage and distribution. Indeed, proper storage conditions are essential for the efficacy of many common dermatologic drugs. In modern hospital pharmacies, drugs are often stored in unit-dose containers on an open shelf. In many cases, the protective market pack is removed; the inner container can be made of transparent plastic materials that offer little protection toward UV and visible radiation. The unprotected drug can then be exposed to fluorescent tubes and/or filtered daylight for several weeks or months before it is finally administered to the patient. **(**James Jerry fahrni et al 2009)

MATERIALS AND METHODS

To access the Comparison of drug storage condition a Performa is designed for different hospital pharmacies having questions related to proper control storage in terms of temperature, light ,humidity, sanitation and ventilation conditions, safe storage Segregate storage, Temperature controlled storage facilities significance of storage conditions factor affecting on storage conditions. Storage of Controlled, narcotics, vaccines. Role of pharmacist in maintenance of storage conditions in a hospital and drug procurement, drug distribution, inventory control, manufacturing of bulk and sterile, cleanup area quarantine storage area. Storage of TPN solution.

RESULTS

Different questions were put in a Performa to check the storage conditions. Then compared in different hospitals in Lahore and Bahawal Nagar.

The visited organizations are as follows, Mayo hospital, Jinnah hospital Children hospital, Services hospital, Ganga Ram hospital, DHQ BWN, THQ BWN, RHC BWN from 7 June 2009 to 25 July 2009.

Table 1 depicts the summary of all datas. The datas reveals as follows,

1. Much appropriate storage racks available for storage of medicines in Jinnah hospital, Ganga Ram hospital, DHQ BWN, THQ BWN. RHC BWN, proper storage racks are present in Children hospital and Services hospital.

2. Near about in all hospitals except in THQ .RHC medicines are protected from sunlight, dust and humidity.
3. Most of the hospitals storage conditions are not hygienic.
4. Near about in all hospitals expect THQ, RHC temperature for storage is appropriate.
5. Security of stores in few hospitals is adequate but in most of hospitals is not adequate.
6. Vaccines and Sera stored properly in refrigerators/freezers in different hospitals.
7. Almost in all hospitals record of temperature is not properly taken

DISCUSSION

Storage is the process of keeping drugs at store. The term used to describe the safe keeping of starting materials, packaging materials; components received semi-finished, in process and finished products awaiting dispatch. The term is also applied for safe keeping of materials and drug products in drug stores, pharmacies, hospitals, etc., under the specified conditions.

Storage Conditions: The conditions specified for storing the product e.g. temperature, humidity, container, etc .

Drugs are chemicals that react to external stimulants such as heat , moisture , light, dust, etc.

Table 1

No.	*Questions*	*Mayo hospital*	*Jinnah hospital*	*Ganga Ram hospital*	*Children hospital*	*Services Hospital*	*DHQ BWN*	*THQ BWN*	*RHC BWN*
1	**Appropriate storage racks available for storage of medicines.**	Yes proper storage racks are present	Not much appropriate	Not much appropriate	Yes proper storage racks are present	Yes proper storage racks are present	No	No	No
2	**Medicines protected from sunlight, dust and humidity.**	Yes	Yes	Yes	Yes	Yes	Yes	Not properly	Not properly
3	**Storage conditions are hygienic.**	75% hygienic	Yes	Not exactly	Yes much hygienic	Yes	Not exactly	No	No
4	**Appropriate temperature for storage**	Yes	Yes	Yes	Yes	Yes	Yes	No	No
5	**Security of stores adequate**	Yes	Yes	Yes	Yes	Yes	No	No	No
6	**Vaccines and sera stored properly in refrigerators/ freezers**	Yes	Yes	Yes	Yes	Yes	Yes	No	No
7	**Record of temperature properly taken.**	Yes	No	No	Yes	Yes	No	No	No

In many cases such reaction leads only to superficial changes, such as discoloration . In many other cases, the reaction may affect the drug more seriously, leading to reduction or elimination of its efficacy and/or potency . There are cases of drugs that, thus affected , not only exert no healing effect but also cause adverse effects on the patient's health; Storage therefore must not be taken lightly.. Storage requirements of drugs are the important stability factor for them.

The drug storage temperature requirements are of the following. Refrigerator is a cold place providing a temperature of between (usually 2° to 8°C/36° to 46°F),Cold place a storage condition has a temperature not exceeding 8°C ,Cool place specifies a temperature 8°C to 15°C, Room temperature is between 15°C to 30°C Cold room is artificially cooled area with a regulated temperature of 12°C to 15°C In fact, these instructions are enough to store medicines properly and one does not usually require further advice on it.

Lexapro is the latest anti-depressant drug belonging to the Selective Serotonin Reuptake Inhibitor (SSRI) group of drugs. It is used in the treatment of depression and generalized anxiety disorders. The following are the storage instructions for Lexapro, which must be strictly adhere to: Store at room temperature between 59 and 86 degrees F (15 and 30 degrees C) .Store away from heat, direct light , and moisture.

Keep the capsule or tablet away from the bathroom , kitchen sink , and other damp places. Heat or moisture can cause the medicine to break down or crack. Keep out of reach of children (this is applicable to all medicines) to conclude , do not take storage of drugs lightly . Improper storage can reduce or even eliminate potency of the drug and this can dilute the patient's confidence in the treatment he or she is receiving. In the case of patients with psychosomatic illnesses , this dilution of confidence can seriously impair chances of recovery and can even lead to suicide.

Distribution and wholesaling form part of the supply chain of drug products must be stored in a manner that does not risk exposure to temperatures outside of their *recommended storage conditions*; potentially impacting the safety and effectiveness of the drug product. Section 11 of the *Food and Drugs Act*, read together with the definition "unsanitary conditions" in Section 2 of the *Food and Drugs Act*, prohibits any person from:*". ..packag[ing] or stor[ing] for sale any drug under ...such conditions or circumstances as might ....render [a drug] injurious to health"* .Fabricators, packagers/labellers, distributors, importers and wholesalers are additionally responsible for the appropriate handling , storage and distribution of drugs according to C.02.015 of the *Food and Drug Regulatios*

These requirements are in place to maintain the quality of the drugs. Every activity in the distribution of drugs should be carried out according to requirements of the *Food and Drugs Act*, the principles of Good Manufacturing Practices (GMP), good storage and good distribution practices. Environmental controls play a key role in maintaining drug quality. Temperature is one of the most important parameters to control. Drugs must be stored, handled and transported according to predetermined conditions (e.g. temperature, etc.) as supported by *stability data* . Check product labels for information on acceptable storage temperature.

CONCLUSION

Concluded as it is a comparative study between different hospitals in Lahore and bahawal nagar (DHQ,THQ,RHC). Study was showed that storage condition in Lahore hospitals much better as compare to Bahawal Nagar DHQ hospitals. The comparison of good storage condition between different hospitals in Lahore were showed that Mayo hospital has much better conditions as compare to other hospitals. it

is recommended to have a separate cold storage room to maintain temperature and humidity. Segregate safe storage of medicines must be in each hospital. Empty of each medicine must be returned and checked by a pharmacist. Bin card system must be change in computerized system of demand and supply as in Services hospital. Nomenclature and quantity of medicine stock must display in each hospital. Narcotic drugs must store properly in each hospital under lock and key Storage condition must be hygienic in each hospital. Pharmacist must educate the patient about the storage condition of drugs.

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