

To educate the community for proper storage and disposal of prescribed medication: The need of today

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Abstract: *Objectives:* To study the attitude and educate the community about proper storage and disposal of prescribed medicine and hazards due to improper storage and disposal of medicines. *Background:* Millions of prescriptions are written every day. Many patients do not finish these medications as prescribed by physician, leaving problem of these unneeded, unwanted or expired medications. *Methods:* Study conducted by II year MBBS students in department of pharmacology. The study period was of two months. Each student asked to visit 10 Houses. During visit student gave questionnaire prepared to the head of the family. Lastly students educated the family for proper storage and disposal of prescribed medicines and hazards due to improper storage and disposal of medicines. *Result:* 48% families do not take medicine as per doctors instruction. 45% were not properly instructed for how to store the medicines. 75% self medicated themselves and the family members by stored drugs. 40% did not see for expiry medicines. They store the medicines in drawers, freeze, plastic bags, plastic containers etc. They disposed the unwanted drugs in dustbins, burn them and liquid form disposed in basin. *Conclusion:* Thus this study will help to bring awareness and educate the community for important but neglected aspect of storage and disposal of prescribed medication. Thus if we include this activity in our Pharmacology curriculum and involve each batch of II year MBBS to do above activity every year, within short period we can educate the larger area of population.

Keywords: Prescribed drugs, Storage/Disposal, Community education.

Introduction

Thousands of drugs coming to market and millions of prescriptions are written every day. Many patients do not finish these medications as prescribed by physician, leaving problem of these unneeded, unwanted or expired medications. 40% of prescribed drugs in United States are never actually used, instead drugs are either stored in medicine cabinet or thrown away [1]. In U.S there is an epidemic of Addiction due to overuse of those stored drugs (opoids, CNS depressants and stimulants). National Survey on Drug use and Health (NSDUH) found that over 70% of people who abused prescription pain relievers got them from friends/relatives [2]. Accidental child exposure to grandparents medicine seen in 45% cases [3-4].

Dozens of drugs, antibiotics, anticonvulsants, mood stabilizers and sex hormones have been found in the drinking water of an estimated 46 million Americans [5]. In May 2010, the U.S Attorney General office signed a letter of support

for two bills one in the House and the other in senate both of which entitled "Secure and Responsible Drug Disposal Act 2009 [6]. In India we are not much aware and no serious steps taken to bring awareness of proper storage and disposal of prescribed medicines. It is necessary to educate people about this problem. So we undertook this study to bring awareness of proper storage and disposal of these prescribed medications in the community.

Material and Methods

Study design: Cross sectional study.

Sample size: 1350 families (135 students each visits 10 houses=1350).

Inclusion criteria: Included all families in selected area.

Plan of work: Study conducted by II year MBBS students in department of Pharmacology after taking permission from

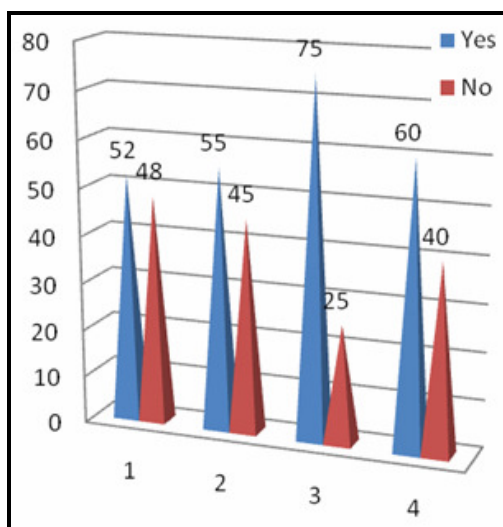
IEC. The study period was of two months. First all the students were made aware of importance of storage and disposal of prescribed medicines. Each student was asked to visit 10 Houses in the selected community. During visit student gave a questionnaire prepared to the head of the family member and asked to answer to questionnaire. Family head was interviewed for how he or she stores and disposes the medicines in the house and was recorded in report form by the students. Lastly students educated the family for proper storage and disposal of prescribed medicines and hazards due to improper storage and disposal of the medicines.

Data collection and analysis: Questionnaire data collected was analyzed for percent of families aware of storage and disposal of medication. Information about how and where were the drugs stored and disposed was collected.

Results

Among 135 students in II MBBS class, 110 students took part in the study. So 1100 families were visited. Statistically percentage and proportion was calculated.

Fig-1: Awareness of community regarding storage and disposal of prescribed medication (Percent)



1. Do you take all the medicine as per doctor's instructions?
2. Are you been instructed by doctors about storage of specific drugs?
3. Do you self medicate or give stored medicines to your family members?
4. Do you check the stored medicines for expiry date?

48% families do not take the medicine as per doctors instruction.45% were not properly instructed for how to store the medicines. 75% self-medicated themselves and the family members by the stored drugs. 40% did not see for expiry medicines.

Questions	Response of community
1. Where do you store the medicine in your house?	Drovers, freeze, plastic bags, plastic containers etc.
2. What is done if date of medicine has been expired?	Throw them
3. How do you dispose the unused medicine?	Throw in dustbin, burnt, Liquid form disposed in basin

They store the medicines in drovers, freeze, plastic bags, plastic containers etc. They dispose the unwanted drugs in dustbins, burn them and liquid form disposed in basin. Lastly students educated the families for how to store the medicines, importance of expiry medicines and how to dispose the unwanted medicines. Feedback from community was encouraging, they were ready to implement the ideas of proper storage of drugs and use proper method of disposal of unwanted medicines.

Discussion

Thus looking at above results, it is necessary to educate people about storage and disposal of prescribed medication. Improper drug storage and disposal can have a direct impact on public safety, the environment and the healthcare services. In our study when family member was asked, whether you take prescribed medication as per Doctors instructions?. 48% of them do not take the medicine as per instructed by doctor (Fig-1).

They stopped the drug when they felt better. In U.S 40% of prescribed drugs are not used, instead drugs are either stored in medicine cabinet or thrown away [1]. Many times the stored medicines consist of NSAIDs or Opioid like analgesic, CNS stimulant drugs, which have abuse potential. The National Institute on

Drug Abuse has estimated that 20% of the population in America will use prescription drugs for non medical reasons within their lifetime [7]. The growing abuse endemic is continually reported in different studies. National Institute on Drug Abuse in 2007, almost 10% of 12th graders abused with Vicodin(acetaminophen) [8]. The North Carolina Youth Risk Behavior Survey (YRBS) reported 20.5% of high school youths have taken prescribed drugs, oxycontin (opiod pain reliever) at least in their lifetime [9].

In our study, when family member was asked, are you been instructed by Doctors about storage of specific drugs? 45% of them said they were not properly instructed for storage of drugs (Fig-1). The drugs should be properly stored in safe place, to prevent chances of poisoning. Over the counter and prescription drugs have caused 75% of all unintentional poisonings in North Carolina [10]. When they were asked, do you self-medicate or give the stored medicines to your family members? 75% of them use the stored medication by themselves and by their family members (Fig-1). When they were asked, Do you check the stored medicines for expire date? 40% of them were not aware of importance of expiry medicines and they did not look for it.

Student's observation: During survey, students observed that the medicines were kept in a plastic bags or a plastic container, which was kept at easy approachable places like in cupboard, on table, in book shelf or kept in freeze (table-1). Keeping all drugs in freeze should be prohibited. The common drugs stored were Analgesics, Antipyretics, Antacids, decongestants, Antibiotics. They were not aware of importance of expiry medicines. They disposed the drugs just by throwing in dustbin, burning it or liquid form of medicine thrown in basin (table-1). Students educated the family members related to, how the drugs should be stored, Importance of expiry medicines and safe method of disposal of prescribed unwanted medicines.

Hazards of unsafe storage and disposal of prescribed drugs

Poisoning: Keeping medicines after they are no longer needed creates an unnecessary health risk in the home, especially if there are children present. In a study looked at cases of accidental

child exposure to grandparents medicine, 45% cases involved medicines stored in child resistant containers and involved child less than 6 years [3-4].

Drug abuse: Prescription drug abuse is the Nation's fastest growing drug problem. This problem of prescription drug abuse in America has grown over the last decade in such a extent that, it is referred as epidemic of prescription drug abuse. The Nation's largest survey of drug use among young people showed that prescription drugs are the second most abused category of drugs after marijuana [11]. In 2011 Prescription Abuse Prevention Plan was expanded upon the Obama Administration Strategy and action is taken on four major areas to reduce prescription drug abuse, Education, Drug monitoring program, Proper medical disposal, and provide law enforcement. India is also facing Prescription drug abuse problem but the exact data is not available.

Environmental pollution: Improper disposal of unused medication poses an unknown threat to the environment and our water supplies. Active pharmaceutical ingredients are contaminating the environment and finding their way into our drinking water via human excretion and improper drug disposal. There is risk of developing resistance to different antibiotics, if consumed this contaminated water with antibiotics. These drugs found in water are also harmful to fish and aquatic life.

Guidelines for proper storage of prescribed drugs

Organize your medications: The first step in getting organized is to take a look at all medicines you have. Do this type of inventory every six months, or at least once a year. Start by checking the expiry date. Medicines with expiry date should be discarded. Also look for medicines that are discolored, dried out, crumbled, if found discard them. Then look for leftover prescription medicines from previous illness. As far as possible discard these, since you should never try to treat yourself (or anyone else) with left-over prescription medicines.

Where to keep the prescribed medicine: Once they are organized medicines should be kept in medicine cabinet box and keep at safe, cool, and dry place. Many times we see medicines are kept in door compartment of refrigerator, which should be discouraged. Only few medicines require to be kept in refrigerator and should be kept as per instructions.

How to keep the prescribed medicine: If there are children around, lock up your medicines in a cabinet or a drawer. It is also necessary to lock up any controlled substances (pain killer, CNS stimulants) that have been prescribed and kept out of hands of young's who may get abuse of prescribed medicines which is a serious problem. Keep your medicines separate from those of your family members to prevent taking wrong medicine by mistake. Keep medicines in good lighting, so that you can see properly which medicine and make sure you are taking the right medicine. Keep the medicine in the bottle it came in (some drugs kept in amber colored bottle as to avoid sunlight) and you can see the information on bottle if needed. Never mix different medicines in the same bottle and end up taking wrong medicine. Keep lids on your pill bottles tightly closed. If there is cotton in the pill bottle when you first open it, remove the cotton as cotton can absorb moisture and spoil the medicine.

Guidelines for proper disposal of prescribed drugs: Proper disposal of drugs is a growing health problem. FDA worked with the White House office of National Drug Control Policy (ONDCP) to develop the first consumer guidance for proper disposal of prescription drugs issue by ONDCP in Feb 2007 and updated in Oct 2009.

Disposal in Household Trash: Unwanted medicines can be disposed in the household trash. Most of the drugs can be thrown in the trash, but consumers should take certain precautions before tossing them out. You have to remove any personal identifiable information from prescription bottle or pill packages. Take unused, unneeded or expired prescription drugs out of their containers and mix them with undesirable substances (like used coffee grounds or kitty litter, spoiled food), put the mixture in an empty can or bag or sealed in an opaque container, before you throw them away. Through container

in trash on the same day the trash is collected, as safely secure from children, pets and others. This is to be later incinerated or placed in a government approved solid waste land fill.

Flushing the medicines: The most effective way to completely eliminate potential for harm is to flush (flushing down the toilet or washing down the sink). FDA believes that the risk associated with accidental exposure to this small selected list of medicines (control substances) far outweighs any potential risk associated (even single dose may be fatal) with disposal by flushing. Fentanyl patches after use should be flushed down the toilet after folding the patch in half so that the sticky sides meet.

Medication Take-Back Programs: Take back program afford proper drug disposal and remove untoward risks to both the environment and the community. This mode of disposal is practiced in U.S. There are different modes of take back programs. "Permanent collection sites" located in the lobby of law enforcement agencies. Each location contains a locked, mounted steel collection bins in the lobby. Unwanted medications are dropped into these bins. Bins are emptied by Law Enforcement officers and ultimately incinerated at Department of Environment quality (DEQ) permitted facilities. DEQ also sponsors "community medication" take-back events called "Clean Out Your Medicine Cabinet". Many community organizations also sponsor medication take back events, but should have approval from Drug enforcement Agency (DEA). Community based programs have the greatest impact [12]. "Mail-back program" called Maine's program launched in 2007, which allows residents to safely dispose of unwanted pharmaceuticals by providing envelopes to mail-back the unused drugs to DEA [13]. The success and positive results from take back program strongly supports this as the best method of disposal in U.S.

Conclusion

Thus this study will help to bring awareness and educate the community for an important but neglected aspect of storage and disposal of

prescribed medication. Thus if we include this activity in our Pharmacology curriculum and involve each batch of II year MBBS to do the above activity every year, within short period we can educate the larger area of population for proper storage and disposal of prescribed medication. Also our Government should bring awareness programs and law enforcement for proper storage and disposal of prescribed

medicines. Pharmacists and other social groups along with health cares should come forward and work on medicine take back program. Thus small steps today may help us to avoid major problems in future.

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