RESEARCH ARTICLE

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A Survey Regarding Drug Shortage in Tertiary Care Hospitals of Karachi, Pakistan

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Abstract

Background: Drug shortages have become a big concering issue for all over the world and for health care providers. The shortage of drugs have adverse and drastic effect on patient care and prescribing practices. **Objectives:** This aim of this study to assess the current drug shortage problems and adverse effect in of tertiary care hospitals of Karachi. **Methodology:** This was a cross sectional study in which data collected from different sources: Physicians and Pharmacist by using purposive sampling technique from October 2016 to March 2017. A total of 472 physician and pharmacist had participated in this study and the data was analysed by SPSS. **Result:** The shortage of injectable dosage form of drug is more common, that accounts for 52.2 % shortage. The main cause of drugs shortage is to increase drugs price which was rated by more than 36% participants.The adverse outcomes due to drugs shortage patient face are length of stay (25%) and cost of treatment (14%) increases reported by respondents. **Conclusion:** Those physicians and pharmacist who are working in public and private hospital sectors have to face drugs shortage problems. The shortage of drugs happen due to various causes and healthcare staff have to bear several challenges furthermore, all of these in the end make negative consequences on patient health.

Key words: Health, Patient, Emergency, Drug shortages, Pakistan.

INTRODUCTION

Drug is a substance which usually use for the diagnosis, cure, treatment, or prevention of disease.[1] The rationale of prescribing drug is to improve therapeutic outcomes, but sometime the drug shortage results in failure to achieve therapeutics outcomes.[2-4] Drug shortage at one end produce adversities in therapeutic outcomes, while on other hands it amplied the risk of medication errors, treatment cost and it is also linked with distrust and frustration of medical health worker.[5-7] Around 80% of total drug shortage is of injectable dosage form and the injectable dosage forms are usually prescribed for treating acute medical emergency conditions such as a heart attack, stroke, or poisoning.[8,9] Moreover, 53% of total drug shortage prevail in analgesics, anti-infective, anaesthetics and cardiovascular drugs agents.[10-12]

The drugs shortage is a global issue and is growing progressively.[13] In Pakistan, the shortage of various life saving medicines prevails across the country.

Many OTC (over the counter) drugs of cough, cold, multivitamins including folic acid, and other common disease conditions like tuberculosis, neurological disorders etc are not available in market.[14] The basic purpose of this study was to explore the root causes and challenges faced by physicians and pharmacist because of the drug shortage.

METHODOLOGY

A multicentered cross-sectional study was conducted in different tertiary care public and private sector hospitals and retail pharmacies of Karachi from October 2016 to March 2017. In this study physicians and pharmacists who were working in tertiary care hospitals of Karachi were targeted. A total of 472 phyisicans and pharmacist had participated in this study. All the physicians and pharmacists were approached purposively who have at least one-year experience, while all those physicians and pharmacists who have switch career to academics and industry side were excluded.

The questionnaire was developed with the help of different other studies.[15] The questionnaire consist of different sections related to demographic, experience of medicine shortages, common type of drug shortages, frequency of drug shortages, causes of drug shortages and experience due to this shortages. All the participants were informed about the study objectives verbally and then written consent was shared before their participation. The data collected from questionnaire. The analysis of collected data done through SPSS version 21.0. All descriptive data was presented in percentages. The study protocol was approved by Department of Health and Hospital Management, Institute of Business Management, Karachi, Pakistan

RESULTS

Among total N=472 participants, physicians (n=236) and pharmacists (n=236) participated in this study. The majority of physicians were male 56% (n=132) and among pharmacists majority also were male 76.3% (n=180) Table 1.

There were 56.7% (n=134) were age group of 30 -34 years while among the pharmacists, majority of pharmacists 68.2% (n=161) were age group of 25 -29 years Likewise, 69.0% (n=163) were from private hospitals and in pharmacists majority 92.4% (n=218) of pharmacist were from private hospitals pharmacy setting Table 1.

There were around 55% physicians and pharmacist who responded that they faced shortage of national drugs brands. Likewise, the most cited dosage form narrated by both physician and pharmacist was injectable dosage form, i.e. around 50-55% are short.

Regarding the mitigation strategy used by physicians and pharmacists during drug shortage, more than 25% of the respondents responded that they identifying therapeutic alternative followed by more than 20% of the respondents who reported to use rationing available. Table 2. In addition to know about causes of drugs shortage most of the participants 36% responded that to increase the drugs prices while 5-6% rated for manufacturing issues.Table 2. In this study over 80 % reported that shortage of drug cause adverse effect on treatment process Table 2.The most common out-comes due to drugs shortage reported by the participants about 30% for treatment delay while 7-8 % responses obtained for second-line treatment Table 2.

DISCUSSION

Table 1: Demographic Profile of Physicians and Pharmacists.					
Description	Category	Physicians		Pharmacists	
		Frequency	Percentage	Frequency	Percentage
Gender	Male	132	56%	180	76%
	Female	104	44%	56	24%
Age	25-29	65	27.5%	161	68.2%
	30-34	134	56.8%	65	27.5%
	35-39	32	13.6%	6	2.5%
	40+	5	2.1%	4	1.7%
Facility Type	Public Hospital/Pharmacy	73	31%	18	7.6%
	Private Hospital/Pharmacy	163	69%	218	92.4%

Table 2: Response of Physician and Pharmacist Regarding Drug Shortage and its associated cause and outcome.

Description	Category	Physicians	Pharmacists
Drug Brand	National**	56.8%(n=134)	58.0%(n=137)
	MNCs**	43.2%(n=102)	42.0%(n=99)
Various Dosage shortage	Injectable*	49.6%(n=117)	54.7%(n=129)
	Oral**	24.6%(n=58)	25.8%(n=61)
	Others	25.8%(n=61)	19.5%(n=46)
Mitigation Strategies	Identifying therapeutic alternative *	24.2%(n=57)	32.2%(n=76)
	Contact vendor or manufacture	11.0%(n=26)	17.4%(n=41)
	Rationing available	28.8%(n=68)	22.0%(n=52)
	Manage inventory	24.6%(n=58)	19.1%(n=45)
	Communicate to other healthcare providers	0.8%(n=2)	0%
	Communicate to hospital administration**	9.3%(n=22)	9.3%(n=22)
	Others	1.3%(n=3)	0%
Causes of Drug shortage	Inventory mismanagement*	34.3%(n=81)	26.7%(n=63)
	Vendor or supplier inefficiencies	10.2%(n=24)	17.8%(n=42)
	Lack of communication	13.6%(n=32)	8.5%(n=20)
	To increase drug prices*	46.2%(n=109)	36.0%(n=85)
	Manufacturing issues**	6.4%(n=15)	5.5%(n=13)
	Uncertain city condition**	16.5%(n=39)	17.8%(n=42)
	Regulatory issues	26.3%(n=62)	10.6%(n=25)
Shortage of drugs cause of adverse effect on treatment	Yes*	89.0%(n=210)	93.2%(n=220)
Adverse effect that patients face due to drugs shortage	Treatment delay**	32.6%(n=77)	30.9%(n=73)
	Complications of treatment	14.0%(n=33)	22.0%(n=52)
	Increase length of stay*	25.0%(n=59)	23.3%(n=55)
	Patients received substandard treatment**	7.2%(n=17)	7.6%(n=18)
	Increase treatment cost**	14.4%(n=34)	14.4%(n=34)
	Death of patient	6.8%(n=16)	0.8%(n=2)

*Sign indicate where responses near to match   ** Sign indicate physicians and pharmacists match

This was a cross-sectional study, in which data was collected from various tertiary public and private hospitals and retail pharmacies of Karachi. The main purpose of this research was to assess physicians and pharmacist response about shortage of drugs and its consequences on health facilities and therapeutic outcomes in operating tertiary public and private hospitals and retail pharmacies of Karachi.

Around 50% participants responded that injectable drugs shortage is most common, whereas many studies mention that the injectable drugs contributes to 80% of drugs shortage.[8,20,22,23] The difference in the responses of participants because of 2 reasons: (1) The responses of physicians and pharmacists about shortage of drugs taken through survey not by any retrospective or by prospective data collection procedure. (2) Most of the physicians and pharmacist who responded in the survey were young and were not experienced, so may be they don't have any knowledge about the shortage of drugs.

In this study more than 30% participants face troubles because of drug shortage for treating patients. In 2011 a study on the impact of drug shortages on health systems in U.S. demonstrated that 50% participants point out the healthcare centers have to face different challenges because of drug shortage.[17-21] The different types of challenges that may encounter are delays therapeutic treatment processes; disease failures and undesirable patient health outcomes.[5]

There were more than 80% partcipants who believed that shortage of drugs cause of adverse outcome on treatment. On the other hand, in Jordan a cross sectional national survey on drug shortage in which only 42% of the participants who responded that shortage of drugs related with adversely outcome on patient health.

[18] Another study that was done by AHA in 2011 on shortage of drugs narrated that 35% of the hospital patients faced undesirable effect due to drug shortages. [16] The difference in the percentage of participants of this study and other study responses could be delicate healthcare system of Pakistan, since the adverse results on patients health could be happen because of various issues, not only because of shortage of drugs.

In this survey, both physicians and pharmacists responded that inventory mismanagement ,maufacutring issues, regulatory issues and uncertain conditions are the major cause of drug shortage. Similar type of reasons were also mentioned in several studies done on shortages of drug. [15,16,18] About consequences that faced due to acute drug shortage, 25% physician and 23.3% pharmacist responded that shortage of drugs made long stay in hospitals. These results are consistent with the result of survey which conducted on effect on patient treatment due to shortage of drugs in which about 30% long stay in hospitals increases.[19]

There were 7.2% physicians and 7.6% pharmacists answered that due to shortage of drugs in hospital patient received sub-standard or second line diseases treatment.Another adverse consequence that mentioned by 6.8% physicians and 0.8% by pharmacists that death in case of drugs shortage patient faced. Laughlin *et al.*, in their study mentioned that 48.5% patient received substandard treatment and 1.2% patients experience death due shortage of drugs.[19,24,25] The flaw between results due to majority of healthcare worker in this survey were young and have little experience and also have basic qualification and no any specialization.

Different types of mitigation strategies are used by physicians and pharmacist in case of drug shortage like: drug rationing; inventory management and generic drug prescribing. The most favoured mitigation strategy used by phyisicians 24.2% and by pharmacists 32.2% was identifying therapeutic alternative. The different strategies also reported by FDA to avoid and respond to shortage of drugs i.e. find supplementary supplier, therapeutic substitute drugs and advance inventory management system.[17,18]

The results of this study based on the participants (physicians and pharmacists) responses who are working in tertiary care hospitals and retail pharmaicies of Karachi. Although, this survey does not represent whole country and global situation of drugs shortages. Despite these limitation,the results of this study present constructive ongoing information about adverse effect because of drug shortages.The basic key to achieve success will certainly improve in the effectiveness of data collecting, teamwork to assess substitutes, and communication with vendors, patients, and administrators.[19]

CONCLUSION

The shortage of drugs is become a global issue in all over the world that extremely effect on the treatment process of patients and also affect significantly on the healthcare service system of insitutition. The shortage of drugs in hospital or pharmacy is multifactorial causation and that can occur because of issues in vendor supplies, mis-communication, regulatory issues, inventory mismanagement and prices issues. The shortage of drugs cause of numerous challenges for Healthcare providers i.e. physicians and pharmacist. Careful choice of drugs, restricting build healthy relationship among all healthcare representatives, make better drug inventory management system and forcasting system based on disease occurrence and incorporated drug management system can help in curtailing the issue of drug shortage in future bases.

CONFLICT OF INTEREST

No conflicts of interest.

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