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Research Article

DRUGS AND THERAPEUTIC INFORMATION SERVICE PROVIDED BY CLINICAL PHARMACISTS FOR AN IMPROVED PATIENT CARE: AN EXPERIENCE FROM A TERTIARY CARE TEACHING HOSPITAL

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ABSTRACT

Objective: To assess the quality of drug information (DI) services provided by clinical pharmacists in a South Indian tertiary care teaching hospital.

Methods: All answered DI queries by the Department of Clinical Pharmacy are documented electronically. To assess the quality of DI services, a quality assessment panel was constituted comprising the senior clinical pharmacists, and a quality assessment checklist was developed and applied for assessing the quality of DI services.

Results: During the 12-month study period, a total of 1204 DI queries were received. The majority (48.76%) of DI queries was received during ward rounds by the clinical pharmacists and among them 61% of the queries was for better patient care. The highest numbers of queries (48%) were received from post-graduate medical students followed by the physicians (16%) and interns (8%). The most common DI queries were requested to know the dosage/administration (22%), followed by cancer chemotherapy dosing (15.70%), adverse drug reactions (8%), drug use in pregnancy/lactation (7.56%), and drug-drug interactions (6.48%). The highest number of queries were from Department of Medicine (26%) followed by Surgery Department (19.35%), Department of Pediatrics (15.61%) and Department of Dermatology (8.47%). The majority of the queries were answered immediately (64%). As per the quality assessment checklist, 64.5% queries were rated as excellent in quality followed by good (35.8%) and only 3.5% DI queries were required improvement.

Conclusion: The quality of DI service was found satisfactory based on the rating.

Keywords: Drug Information, Quality Assurance, Clinical Pharmacists, Medicine Information

INTRODUCTION

Provision of drugs and therapeutic information (DTI) to clinicians is one of the fundamental responsibilities of clinical pharmacists [1]. DTI refers to the provision of unbiased, well-referenced and critically evaluated up to date information on any aspect of drug use [2]. Unbiased information regarding the appropriate use of drugs by pharmacists assists the prescribers to individualize drug therapy to their patients to achieve the desired therapeutic outcomes and also contribute for better patient care [3]. Availability and acceptability of DTI service across the world is still needs recognition due to various attributing factors like traditional prescribing habits, inadequate recognition of clinical pharmacy services in many countries, lack of funding and necessary DTI resources [4]. However in the current scenario of health care system, DTI services are sounds to be necessary due to increased patient load with co-morbid conditions and availability of more number of drug molecules in the market and polypharmacy. Thus, provision of DTI helps practitioners to rationalize the therapy for their patients' care [5].

Clinical pharmacists are referred as "Medicines Experts" and hence are well-trained for this service [6]. They acquire necessary skills and competencies to evaluate literature and other applicable information resources to formulate and deliver the answer for the requested drug information (DI) queries [7]. Many published literature are available corroborating the clinical pharmacists' expertise in providing DTI service [8-10]. DTI is an integral part of health care service, thus, it is essential to monitor the quality of the service to ensure that it is provided in an acceptable manner and to identify further scope for expansion and improvement. Thus, this study was conducted to assess the nature, extent and quality of DTI provided by the clinical pharmacists in a tertiary care teaching hospital.

METHODS

This was a prospective study conducted by Department of Clinical Pharmacy located in a South Indian tertiary care teaching hospital. The hospital is a 1200 bed hospital with various specialties. Patients from various socio-economic backgrounds are admitted to the hospital, and majority patients are from lower economic status. Department of Clinical Pharmacy was established in the hospital in 1997, and since then involved in providing the clinical pharmacy services such as drug therapy review, patient medication counseling, pharmacist consultation for individualized drug therapy, patient referral for assessment of drug-related problems and its management. A well-established drugs and therapeutics information center assists residents, interns and junior medical officers in receiving the appropriate and unbiased information pertaining to the use of drugs. Post-graduate students of pharmacy practice (M Pharm) and doctor of pharmacy (Pharm D) students are considered as trainee clinical pharmacists/ward pharmacists at the study hospital and are usually posted to different medical departments on a rotation basis to attend the ward rounds with the doctors to provide pharmaceutical care services.

Trainee clinical pharmacists posted into different wards, receive DI queries from the doctors during their ward rounds and send the same through direct access to DI center or through telephone. All the queries received are reviewed, processed and answered in consultation with the senior academic clinical pharmacists. Trainee clinical pharmacists also review treatment chart during ward rounds and identify medication-related problems (MRP). All the identified problems are discussed with senior academic clinical pharmacists, and appropriate information is provided to the concerned clinician to resolve the identified MRPs. All the answered queries were documented electronically in the department database. To assess the quality of DI service, DI database

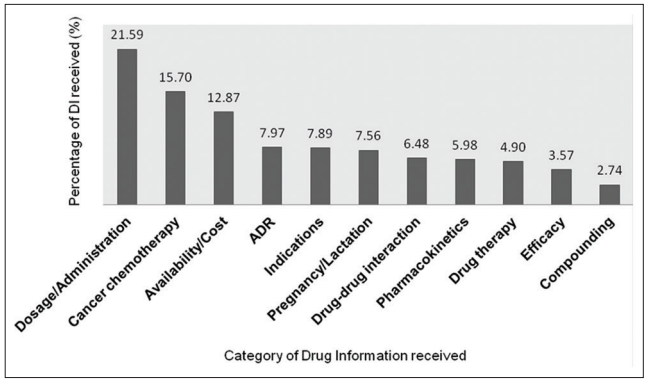

Fig. 1: Categories of drug information provided. ADR: Adverse drug reaction

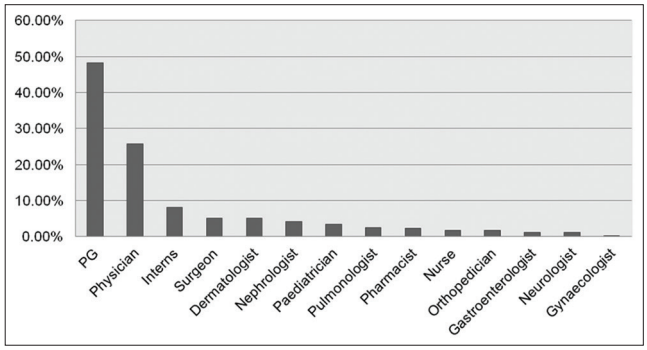

Fig. 2: Professional status of drug information requester. PG: Post-graduate medical students

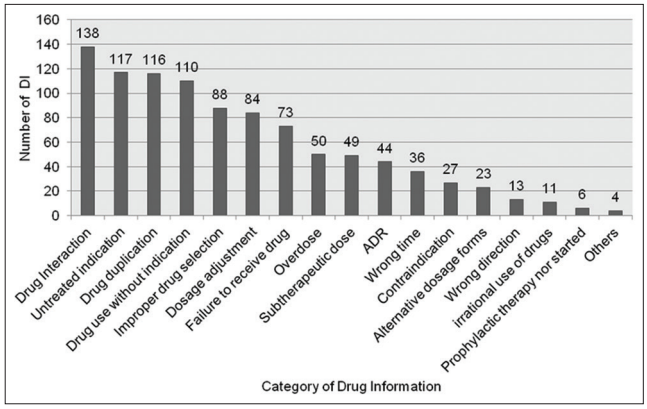

Fig. 3: Category of drug information provided through treatment chart review

was reviewed from January 1 to December 31, 2012, to analyze the nature and extent of DI provided by the department.

To assess the quality of DI service provided, a quality assessment panel was constituted comprising of one senior level and one junior level academic clinical pharmacists' and developed a checklist to assess DI quality (Table 1). Based on the score obtained from checklist, each evaluated DI was rated as excellent, good, can improve, and should improve. This panel conducted the audit on weekly basis and picked up 20% answered DI queries randomly and assessed the quality using the checklist.

RESULTS

During the study period, a total of 1204 DI queries were received from various clinical departments and the prescribers of the hospital.

Table 1: Quality assessment checklist for DI

Department of Clinical Pharmacy, JSS Medical College Hospital, Mysore			
Quality Assessment Checklist: DI			
Date of Documentation of DI:			
Name of Attending Pharmacist:			
Date of Audit:			
Reference No:			
Quality assessment questionnaires			
S. No.	**Question**	**Yes**	**No**
1	Was patient specific background information collected?		
2	Was details of enquirer collected?		
3	Were appropriate resources referred?		
4	Was appropriate answer given?		
5	Was DI provided reviewed by staff?		
6	Was DI provided within the specified time?		
7	Was DI provided documented completely?		
8	Were efforts made to follow-up for further information wherever needed?		
Grade A: Excellent, Grade B: Good, Grade C: Can improve, Grade D: Should improve. A: 7-8 points, B: 5-6 points, C: 4 points, D: 3 or less			
Remarks:			
Auditor:			
Signature:			
Note: Checked Yes carries 1 point. Checked No carries 0 point			

DI: Drug information

The majority (48.76%) DI queries were received during ward rounds followed by through direct access to DI center (31.06%) and around 20% of queries were requested through telephone (to intercom and direct number). Around 61% of total DI queries were requested for the purpose of better patient care and remaining (around 39%) were requested to update the knowledge of prescribers. On exploring the different categories of DI queries, it was observed that 21.59% queries were related to dosage/administration of the drugs followed by queries on dosage adjustments in cancer chemotherapy (15.70%), 18.70% of the queries were related to the availability and cost of the drug, 7.97% of the queries were related to adverse drug reactions, 7.89% queries were related to indications of the drugs, drug use in pregnancy/lactation (7.56%), drug-drug interactions (6.48%), pharmacokinetics (5.98%), drug therapy (4.90%), efficacy of drug (3.97%), and calculations and compounding of drugs (2.74%) (Fig. 1). Looking at the professional status of the DI requesters, post-graduate medical students made the highest (48.17%) requests followed by physicians (25.70%), interns (8.06%), surgeons (5.06%) and dermatologists (5.06%), and nephrologists (4.15%) (Fig 2.). Most (63.95%) of the DI queries were answered immediately followed by within 2-4 hrs (23.34%), whereas around 10.38% of queries were answered within a day, and 2.33% of queries were answered within 1-2 days of time. When the quality of DI service was analyzed, Out of 240 DI requests answered among them, 64.5% of them was rated as excellent, 35.8% of them were rated as good, whereas 3.73% of queries needed an improvement in the quality of provision of DI.

A total of 989 MRP were identified during treatment chart review of 8540 patients. The common MRPs identified were drug-drug interaction (14%, n=138), untreated indication (12.4%, n=117), drug duplication (11.7%, n=116), drug use without indication (11%, n=110), and improper drug selection (8.9%, n=88), and improper dosage (8.49%, n=84). The details are presented in Fig. 3. DI was provided to resolve all the 989 MRPs identified.

DISCUSSION

The goal of any DI service is providing accurate and useful information within the time to the requester. This goal will be achieved only when

Table 2: Quality assessment results of DI service

Month	Total DI documented	Total DI evaluated	Grade	Percentage
January	109	22	18 A, 4 B	81.8% A, 18.2% B
February	102	20	18 A, 2 B	90.0% A, 10.0% B
March	59	12	12 A	100% A
April	64	13	10 A, 3 B	76.9% A, 23.1% B
May	46	9	8 A, 1 B	88.8% A, 11.1% B
June	65	13	3 A, 10 B	23.1% A, 76.9% B
July	164	33	27 A, 6 B	81.8% A, 18.18% B
August	144	29	14 A, 11 B, 4 C	48.56% A, 37.53% B, 13.91% C
September	176	35	19 A, 14 B, 2 C	54.2% A, 40.0% B, 5.7% C
October	95	19	3 A, 14 B, 2 D	15.78% A, 73.85% B, 10.37% D
November	87	17	14 A, 3 B	82.35% A, 17.65% B
December	93	18	9 A, 8 B, 1 C	50.0% A, 44.4% B, 5.60% C
Total	1204	240	155 A, 76 B, 7 C, 2 D	64.5% A, 31.8% B, 2.91% C, 0.82% D

DI: Drug information

the DI center has necessary infrastructure, resources, and well-trained staff. Over a period of time, Department of Clinical Pharmacy has acquired all these. However, it is equally important to ensure the quality of the service. Thus, the present study was taken up to assess the quality of the DI services. All the DI queries requested during the study period were answered on time. The highest number of DI requests during ward rounds indicates active presence and routine contribution of clinical pharmacists inwards for better patient care. Many DI requests were made directly to DI center either in-person or via telephone, indicates requesters are well known and flexible to function of DI center. The majority requesters had asked queries for the purpose of improving their patients' health which is suggestive of the medical staff's keenness in utilizing the DI service. However, post-graduate medical students use the DI services to update their knowledge, and it is good sign that the DI center is useful to them as learning resource. This practice ensures in updating the therapeutic knowledge and in turn helps in achieving the better patient care.

Among all the requesters, half of the total DI queries were requested by post-graduate medical students clearly conveys that they are very well familiar with functioning and quality of DI service provided by clinical pharmacy department. Regular usage of DI service by post-graduate students may be under the influence of senior practioners who have accepted DI service by pharmacists at study hospital since more than a decade and similarly these post-graduates when they become independent medical practitioners may encourage upcoming students and practioners to utilize DI service provided by clinical pharmacists for therapeutic decision making. DI requests from different specialists and super specialists show that DI service of the clinical pharmacy department is not limited and accepted to only few medical specialists, but it is spread across the hospital and accepted by the majority of consultants.

Maximum number of DI requests was made for dosage/administration of a drug. This may be due to individualization of a dosage regimen in patients with renal impairment or hepatic impairment or pregnancy/lactation or presence of comorbidities. In addition to this, post-graduates students are expected to be sure about the dose and dosage range in treating their patients. Requests for dosage calculation in cancer chemotherapy protocols for the patients with different types of cancers from surgeons were the second highest in number. This shows the acceptance of DI service by surgeons (including post-graduate students of surgery). Standard cancer chemotherapy protocol provided by clinical pharmacy department includes patient specific dosing information, pre-regimen medications, duration of the treatment, and administration guidelines for each chemotherapeutic agent and cost of the therapy so such protocol helps clinicians and nurses both to proceed for high-quality cancer care. DI pertaining to adverse drug reactions, indications, drug use in pregnancy/lactation, drug-drug interactions and efficacy of drugs were also requested in significant number suggestive of broader acceptance of clinical pharmacists DI service across the hospital. Scope for DI service was highly appreciated while performing treatment chart review by clinical pharmacists. Drug-drug interactions, irrational drug therapy in special cases, need for dosage adjustment in the treatment chart was routinely identified and intervened to concern practioners by ward pharmacists themselves, and hence less number of DI queries was made for drug-drug interactions, selection of drug therapy in special cases.

Majority DI queries were received from Department of Medicine, Surgery and Pediatrics which may be because more number of trainee clinical pharmacist are posted and also may be due to positive attitude of physicians, surgeons, and pediatricians about clinical pharmacy services. However, percentage of queries received from the other departments was also encouraging and a good sign of acceptance of the service.

Most of the DI queries were answered immediately and within 2-4 hrs which determines that clinical pharmacy department is well equipped in terms of journals, textbooks, software, and clinical pharmacists are well-trained and competent to meet the expectations of the health care providers.

Quality assessment of DI service

Quality assessment of DI service is done to maintain and improve the standards of services provided efficiently and effectively. In the present study, audit was conducted as a method to assess the quality, as it is the easiest and suitable method for adoption. The results of an audit had shown that majority DI queries answered were in the rating of "excellent in quality." This ensures the following of standard operating procedure for providing a DI answer. However, around 3% of DI queries provided need improvement, and this was due to inadequate background information, lack of follow-up and poor documentation.

CONCLUSION

DI service provided by clinical pharmacy department is widely accepted by the interns, residents and clinicians of the hospital. Medicine department among other clinical departments used the DI services maximum as the clinicians use more number of drugs in treating various clinical conditions. Clinical pharmacist role is well-appreciated by all the DI requesters in providing unbiased DI on time (Table 2). Regular quality assessment of DI services will further improve the quality of the service and also the acceptance rate by the requesters.

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