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## Retrospective Study to Analyse and Evaluate Drug Information Query Services Provided By Clinical Pharmacists at a Tertiary Care Teaching Hospital

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### Abstract

The aim of this study is to assess the nature and quality of drug information services provided by clinical pharmacists at a tertiary-care teaching hospital, Guntur. A retrospective study, for 12 months in the pharmacy practice department of a tertiary care hospital. Ethical clearance was obtained prior to the study. The drug information center is equipped with required resources and facility (e.g., text books, toll free telephone service, internet and online services). The drug information services provided by the center were recorded in documentation forms. The nature and quality of services provided was assessed by a quality assessment checklist developed in accordance with World Health Organization guidelines. A total of 512 queries were received, majority ( $n = 217$ ; 41.4%) of the queries were asked by the doctors to provide optimal patient care. Post graduates, nurses, interns and patients have also availed these services but to a lesser extent. Most of the queries were received during ward rounds ( $n = 258$ ; 50.39%), followed by direct access ( $n = 183$ ; 35.74%). The service provided was graded as excellent for the majority of queries ( $n = 431$ ; 84.17%;  $p < 0.001$ ), followed by very good ( $n = 78$ ; 15.23%) and good ( $n = 3$ ; 0.58%). Clinical pharmacists provided requested services in a skillful, efficient and evidence-based manner to meet the needs of the requestor. The enquiries and information provided is documented in a clear and systematic manner.

**Keywords:** Drug information query services, Drug information center, Clinical pharmacist, evaluation, quality, enquirer.

### 1. Introduction

Drug information is the provision of written and /or verbal information or advice about drugs and drug therapy in response to a request from the other health care providers, organizations, committees, patients or members of the public. Drug information services (DIS) is the service provided by well-trained clinical pharmacist to provide accurate, unbiased, factual information regarding the drug use in patients received from any health care professional [1]. These activities are undertaken by the especially well trained individuals i.e. Clinical Pharmacist and Doctor of pharmacy professionals in providing information to optimising the drug therapy. This providing drug information to health care professionals is an important mechanism which is accurate and timely to provide safe and effective drug therapy to the patients, but in India this provision of providing drug information is still infancy [2].

Drug information from commercial sources is often biased and hence noncommercial, independent and unbiased source of drug information is important. The provision of accurate and timely drug information to health care professionals is an important mechanism to promote safe and effective drug therapy to patients, but such service is lacking in India.

After developing drug information centres in various parts of India clinical pharmacists directly have impact on the patient care by numerous interventions, decreasing the medication errors and improve the patient compliance [3].

The role of clinical pharmacist is to provide unbiased non commercial independent well referenced information to the health care providers for the better patient care. A clinical pharmacist providing drug information services is an important part of his/her daily activities. As a part of routine pharmacy practice effective drug information and evaluation skills play a major role. Pharmacists have become increasingly involved in influencing prescribing, so it is important that they should provide unbiased, evidenced based drug information to the prescribers [3].

Drug information service (DIS) is the service that encompasses the activities of specially trained individuals to provide accurate, unbiased, factual information, primarily in response to patient-oriented problems occurred from the healthcare teams [4]. Up to now, the number of

novel drugs and dosage forms has been increasingly discovered and available worldwide, leading to the challenging and difficult task for the selection and use of current drugs and also drug delivery systems. Therefore, DIS is necessary to perform useful functions such as providing support for clinical pharmacy services, teaching undergraduate and graduate pharmacy students, and performing reviews for pharmacy and therapeutics committees<sup>[5]</sup>.

### Objectives

The main objective of the study was to assess and evaluate the drug information services provided by clinical pharmacists to the health care professional at a drug information centre.

The specific objectives were to evaluate the query using certain parameters like mode of receipt of query, professional status and speciality of enquirer, purpose and category of query, time frame for reply and sources used to provide answer to the queries.

### 2. Materials and Methods

**Study design:** This is a retrospective, observational, hospital-based unicentric study.

**Study duration:** The study is conducted for a period of one year i.e.12 months, from May 2014 to May 2015.

**Study Materials:** Drug information documentation forms and Feedback Questionnaire. These forms were evaluated on various parameters like speciality, status of enquirer, purpose of the enquiry, mode of request and question category etc. These documentation forms were filed and maintained by the department.

**Study site:** Drug information centre, Department of Pharmacy Practice, Government General Hospital Run by Chalapathi Institute of Pharmaceutical Science, at Government General Hospital, a 1400 bedded tertiary care teaching hospital, Guntur, Andhra Pradesh, India. Department of Pharmacy Practice, established in the year 2009, is an integral part of the hospital which caters clinical pharmacy services. The centre is well equipped with well trained staff and a library consisting of textbooks, National and International journals, computers and internet facilities along with electronic database such as Micromedex and Clinical Pharmacology for provision of various services.

**Ethical approval:** obtained from the institution before the initiation of the study. In accordance with the Declaration of Helsinki and the ethical guidelines established by Guntur Medical College Guntur, all study objectives, as well as data protection and analysis methods, were explained. All study protocols were approved by the institutional ethics committee, Guntur Medical College and Government General Hospital, Guntur.

**Study procedure and data collection process:** Drug information services were provided by the clinical pharmacists during ward rounds, direct access, telephone and mail, which were documented in the drug information request and documentation forms prepared by the clinical pharmacists of department of pharmacy practice. These services were free of cost and voluntarily provided for the aim of better patient care. Assessment and evaluation of drug information services were carried out in three steps:

The evaluation of drug information services involved in two steps. First step is assessment of drug information request and documentation forms, for various parameters like status of the enquirer, medical specialty, mode of request, type of queries, mode of reply, time frame to reply and references used to provide queries.

Second step is assessment of the quality of services from receivers perspective by providing feedback questionnaire circulated and collected, which comprised of questions on awareness, utilization, ease of contact, and quality of services provided. The key points which were considered for evaluation includes effectiveness in obtaining the demographic data of the enquirer and collection of background information, level of understanding of the question, using search strategy, evaluation of literature and immediate response given by the provider.

### Selection Criteria

**Inclusion criteria:** Drug information queries from health care professional and patients of Government General Hospital, Guntur.

**Exclusion criteria:** Drug information enquiries from others (outside hospitals and patients).

### 3. Results and Discussion

A total of 512 drug information queries were received by clinical pharmacists during the study period of 1 year. Drug information services were provided to all healthcare professionals, of the total 512 queries maximum were received from physicians or doctors 217(41.4%) followed by patients 121(23.63%),nurses 89(17.38%), pharmacists 36(7.03%)and interneers 18(3.51%) as shown in table 1. Among the total number of queries received by the drug information center maximum were from general medicine-184(35.93%) which could be due to maximum number multiple diseases and there is a major utilization of drug information services, more utilization of drugs that require timely, unbiased information on drugs and which could also be due to more number of interns of pharmacy practice are posted to this department. The services of the department were utilized by that of general medicine 184(35.93%) followed by gynecology 61(11.91, pediatrics 52(10.16%) and oncology 41(8.01%) respectively as in table 2. The results of our study are similar to a study of Jeevangi V M *et al.*<sup>[6]</sup> which shows maximum number of queries arises from the department of general medicine which supports our study<sup>[6]</sup>.

The purpose of the queries asked was categorized and maximum queries 218(42.57%) were asked to update knowledge, followed by 124(24.21%) for the better patient care as shown in table 3. Similar findings were identified with Jeevangi *et al.*, study and Mahendra Kumar BJ *et al.*,<sup>[7]</sup> a study conducted in 2011 where most of the queries asked to update knowledge and clinicians have utilized their services<sup>[7]</sup>. The queries were requested using various modes and most 258(50.39%) of them were asked during regular ward rounds attended by Pharm.D interns. A relatively higher number 183(35.74%) of queries were also asked by mode of direct access, shows that the clinical pharmacists are accessible to all other departments. Least number of queries were 19(3.71%) received by telephone which shows that most of the practitioners were not aware of the facility available in the department, the results as depicted in table 4. A previous literature supports our study, Beena G *et al*<sup>[8]</sup> conducted a retrospective study for a period of 1 year provides 666 queries,

shows that maximum numbers of queries were received during ward rounds (70.7%)<sup>[8]</sup>.

Most of the queries were replied in the oral/ verbal format 317(61.91%) and all of them were documented. Other forms of reply were also used such as printed format 75(14.64%), written 68(13.28%) and e-mail 52(10.15%) respectively as in table 5. The present study findings coincide with a study conducted in 2010 by Singh R *et al*<sup>[9]</sup>.

Maximum 209(40.82%) of the queries were replied with a day, 84(16.41%) of the queries were answered within a week. Certain queries which needed immediate replies were answered immediately 153(29.88%) as in table 6. Most of the physicians were satisfied with the time taken to respond to the queries.

To answer the received queries we used primary, secondary, and tertiary sources. Most of the sources used to reply for the queries were text books 174(33.98%) which could be due to easy access and quick retrieval of information and availability of recent and relevant information, followed by an electronic database Micromedex 109(21.28%) clinical pharmacology software, journals 71(13.86%) and websites 104(20.31%) as in table 7.

Most of the queries were asked for adverse drug reactions 109(21.28%) followed by dosage and administration 104(20.31%). Present study shows that out of total 512 queries maximum were focused on adverse reactions followed by dosage 104(20.31%), drug of choice 61(11.91%), interactions 52(10.16%), pregnancy and lactation 32(6.25%), indications 31(6.05%), pharmacokinetics pharmacodynamics 15(2.92%), compatibility/ stability 06(1.17%), as depicted in table 8. The current study also shows the similar results as that of Jeevangi VM, 2011<sup>[6]</sup>.

A study Mahendra kumar BJ *et al.* conducted for a period of one year also showed that maximum number of queries were on dosage and administration<sup>[7]</sup>.

**Table 1:** Professional Status of the enquirer

Requestor	Number (%)
Physicians	217(41.4)
Interns	18(3.51)
postgraduates	31(6.05)
Pharmacist	36(7.03)
Nurses	89(17.38)
Others	121(23.63)

**Table 2:** Medical specialty of the enquirer

Speciality department	Number (%)
General medicine	184(35.93)
Gynecology	61(11.91)
Pediatrics	52(10.16)
psychiatry	31(6.05)
Casualty	29(5.66)
Oncology	41(8.01)
Dermatology	32(6.25)
Neurology	29(5.66)
Others	53(10.35)

**Table 3:** Purpose of the received queries

Purpose of query	Number (%)
Update knowledge	218(42.57)
Better patient care	124(24.21)
Education or academic	72(14.06)
All the above	98(19.14)

**Table 4:** Mode of request of the received queries

Mode of request	Number (%)
Direct access	183(35.74)
Ward rounds	258(50.39)
E-mail	52(10.15)
telephone	19(3.71)

**Table 5:** Mode of reply

Mode Of Reply	Number (%)
Oral/verbal	317(61.91)
Written format	68(13.28)
Printed format	75(14.64)
E-mail	52(10.15)

**Table 6:** Time frame to respond to queries

Time frame to reply	Number (%)
Immediately	153(29.88)
Within a day	209(40.82)
2-4 days	66(12.89)
Within a week	84(16.41)

**Table 7:** references used to answer queries

Reference sources	Number (%)
Text Books	174(33.98)
Journal	71(13.86)
Websites	104(20.31)
Micromedex	109(21.28)
others	54(10.54)

**Table 8:** Type and Nature of query

Type of query	Number (%)
Availability	29(5.66)
Indications	31(6.05)
Pharmacokinetics	15(2.92)
Toxicology	32(6.25)
Dosage/Administration	104(20.31)
Drug of choice	61(11.91)
Compound Formulation	12(2.34)
Drug interactions	52(10.16)
Adverse effects	109(21.28)
Teratogenicity	29(5.66)
Lactation/Infant risk	32(6.25)
Stability	06(1.17)

**Evaluation of drug information services:** A quality assessment checklist was prepared in accordance with DSE/WHO seminar guidelines<sup>[10]</sup>. The quality of the services provided by the center was assessed by conducting a survey using a quality assessment checklist. This checklist consisted of questions with three options/choices (Yes/No/Not Applicable NA) for each question. The option “Yes” and “NA” represent 1 point; while “No” represent 0 point. The grading was performed on the basis of scores obtained as follows: Excellent (score = 10), Very good (score = 8-9), Good (score = 5-7), Poor (score = 3-4) and Unacceptable (score = 1-2). After evaluation queries were scored. The minimum acceptable level of rating was considered to be 3.

Two-third of the answered queries are randomly selected for the assessment of quality of services. The quality of services was assessed on the basis of information collected on: (a) Sufficient information related to enquirer, patient and drug substance (b) appropriateness of urgency of situation (proper assessment of urgency of the situation) (c) appropriateness of references/resources used to retrieve the information (d)

quality of gathered information (critical assessment of gathered information prior to communication) (e) satisfaction of enquirer's need (f) promptness of service (provision of service within specified duration) (g) quality of documentation of provided service (proper documentation) and (h) promptness in follow-up (if required). The questionnaire was prepared by considering the overall details collected on different aspects including: (a) Details of enquirer, patient and query, (b) urgency of the situation, (c) resources, (d) analysis, (e) appropriateness of the information and (f) time taken to provide information. Documentation in an appropriate format and follow-up details were also verified to assess the quality of services.

A total of 245 feedback questionnaires were distributed to the healthcare professionals of physicians, postgraduates, interns, nurses randomly of different departments in the hospitals for their feedback on the quality of drug information services, of which all (100%) responded. Of all the respondents 73.82% were aware of drug information centre in the hospital and 56.3% utilized the drug information services in their routine. For a question among the respondents who utilized the drug information services, 98% of the respondents received the answer in time appropriately. Out of all 67.47% accepted that they are able to contact the services easily in the hospital.

#### 4. Conclusion

The results of the current study indicated that services were provided in a timely and excellent manner. Importantly, the services provided helped the doctors to provide optimal patient care and update their knowledge. Most of the queries were received during ward rounds ( $n = 258$ ; 50.39%), followed by direct access ( $n = 183$ ; 35.74%) which could be attributed to the easy accessibility of a clinical pharmacist that prompts them to utilize the services. Very few queries were asked on phone and internet which could be due to lack of awareness of the facility available in the department. Drug information services were predominantly provided through verbal communication ( $n = 317$ ; 61.91%). Upon receipt of queries, the required service was provided immediately ( $n = 153$ ; 29.88%) or within a day ( $n = 209$ ; 40.82%), maximum of 1 week time is taken to respond to the query. Most of the queries were related to adverse reactions, followed by dosage, complete drug profile, drug therapy, availability of the drug, etc. Electronic databases such as micromedex and clinical pharmacology software were used after text books which could be due to easy access and quick retrieval of information and availability of recent and relevant information. Pharmaceutical and medical areas are well represented on the internet with an enormous wealth of information. In the survey conducted among the healthcare professionals, a great percent of the respondents were aware of the drug information services available and have been utilizing the services. Compared to the size and number of departments existing in the hospital the queries obtained were quite few, which can be improved.

The center has been recording queries and related information in a clear and systematic manner. The service has been provided in a skillful, efficient and evidence-based manner. The quality of service provided to a majority of queries was graded as "Excellent".

The service provided was graded as excellent for the most of queries ( $n = 431$ ; 84.17%;  $p < 0.001$ ), followed by very good" ( $n = 78$ ; 15.23%) and good ( $n = 3$ ; 0.58%).

This indicates that drug information center, providing critical services as envisaged for the center, evaluated in the current

study is well-equipped to provide the requisite information.

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