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ORIGINAL ARTICLE

Evaluation Of Poison Information Services Of A Clinical Pharmacy Department In A South Indian Tertiary Care Hospital

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ABSTRACT

Introduction

Good quality poison information services reduce mortality, prevent prolonged hospitalization and are cost effective. Continuous evaluation of the information services is essential to upgrade the quality of the poison information services provided.

Methodology

A retrospective study was conducted to evaluate the quality of all the poison information documented over a period of four years. The quality was measured, based on DSE/WHO seminar guidelines. The quality of service provision after evaluation was scored and rated from poor to excellent, based on the scales, with a 100 point rating. The outcome of the service was evaluated by comparing the mortality rate for the cases in which the poison information service was provided, with the cases in which the Poison Information Center was not consulted.

Results

A total of 210 poison information queries were answered during the study period. More than 80% of queries were rated as excellent, as per DSE/WHO seminar guidelines. The mortality rate was reduced in cases where the Poison Information Center was consulted (0.9%) and it was lower compared to that of the cases where the Center was not consulted (12%).

Conclusion

The evaluation of the services of the Poison Information Center showed that the services provided during the study period were rated as 'excellent' and they reduced the mortality rate.

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Introduction

Poison control centers have been established with the main objective of improving the management of poison cases and the prevention of poisoning. In most of the developing countries, these services are not commonly available in hospitals. Establishment of communication between clinicians and toxicologists and availability of antidotes could be helpful in reducing morbidity and mortality in cases of poisoning[1]. Poison information center consultation may prevent treatment delays. A secondary benefit is that the expenses associated with unnecessary transportation to another health care facility, personnel, and medical evaluation, may be avoided by consulting a poison center[2]. Providing timely and appropriate medical care is important in any exposure situation, whether the substance in question is a chemical or drug[3]. Internationally, the World Health Organization and the United Nations recognize the importance of poison information services in developing countries like India[4]. Poison information services are cost effective and can reduce health care expenditures by reducing unnecessary admissions, or prevent prolonged hospitalization[5],[6],[7]. This study was carried out to assess the quality and effectiveness of poison information services provided in a tertiary care hospital of South India. A retrospective study was carried out in a poison information center of the clinical pharmacy (Pharmacy Practice) department of a South Indian tertiary care hospital from the period of 2003 to 2006. The study aimed specifically to evaluate the poison related services provided in terms of the category, quality of poison information and the outcome of such services.

Methodology

The study was carried at the clinical pharmacy (Pharmacy practice) department of a tertiary care teaching hospital in Karnataka, a South Indian state. Retrospective evaluation of the data was carried out for the period of three years from January 2003 to December 2006.

Materials

Poison Information request and documentation forms

The poison information request and documentation forms were used for the study which contained the patient's background information like, type of poison consumed, the clinical status of the patient and the urgency of the information request, which is recorded before providing the poison information. The request form also contained data like, the demography of the enquirer, enquiry, purpose and mode of enquiry. The Poison information documentation form included the category of information provided, details of information provided with references, mode of reply, time taken to provide information and the provider's signature and date. Poison information requests were received either telephonically, during ward rounds of the pharmacist, or during daily visits by the pharmacist to the casualty departments or during the direct approach of the enquirers. Appropriate information sources like text books and computerized databases were used in answering queries.

A standard operating procedure was established in the department for the systematic provision of poison information. The procedures include the steps to receive an information request, the modified systematic approach for collecting information from available resources and the systematic presentation of the collected information.

Quality Control Checklist

The quality of all the poison information services from the provider's perspective was analyzed, based on the guidelines from the DSE/WHO seminar [8]. This seminar gave guidelines on the evaluation of the quality of the drug information services and its documentation. This guideline was used to evaluate the poison information documents and services in this study. The aspects that were considered during evaluation included

the effectiveness in obtaining the demographic data of the enquirer and collecting the background information, adequacy of literature search, provision of an answer according to the enquirers need, adequate documentation and follow-up [Table/Fig 4]. When evaluating the demography of the enquirer, completeness of the form for aspects like name, designation and contact information of the enquirer was checked. If everything was properly documented, then 10% of scores were awarded. If the background information of the patient was clearly documented, then 10% of scores were awarded. The adequacy of the literature search was evaluated by the quality and the number of references documented in the form and accordingly scores are given. Based on the answer to the query, the critical evaluation of the literature by the responder was assessed and scored. Provision of answers according to the enquirer's need, implies whether the answer sufficiently answers the question raised by the enquirer, whether the time frame requested by the enquirer is met or not and accordingly grades were marked for this aspect. The entire documentation of the poison information request and answer was evaluated and scored. Finally, it was evaluated whether the follow-up was done and properly documented. Then all these aspects were evaluated and the total scores were added up. Based on the evaluation, each document can get scores from a minimum of 0 to a maximum of 90%. Based on the total scores, they were rated as poor if the score was less than 50%, as fair if it was between 51-60%, as good if it was between 61-70%, as very good if it was between 71-80% and as excellent if it was 81% or more. The minimum acceptable score was considered to be 60%.

(Table/Fig 4)Quality control questionnaire for drug information services

1. The demographics of the requester is obtained.	Y/N
2. Appropriate background information obtained.	Y/N
3. Resources consulted is quoted	Y/N
4. Adequate resources consulted.	Y/N
5. Critical evaluation of the answer obtained is done by the pharmacist.	Y/N
6. Was the answer given in the specified time.	Y/N
7. Was the answer given based on the enquirer's need.	Y/N
8. Proper documentation was done.	Y/N
9. Follow-up was done.	Y/N

Grading of the services will be done as follows

Poor	: < 50%
Fair	: 51-60%
Good	: 61-70%
Very good	: 71-80%
Excellent	: > 81%

A retrospective evaluation of the poison information services was carried out, based on the quality of all the request and documentation forms during the study period. The records were assessed using the quality control checklist and were rated according to the predetermined scales. The demography of patients admitted during the period was analyzed to assess the outcome of those for whom the poison information was provided.

Statistical Analysis

The mean scores of quality rating were compared between four years, using the one way ANOVA test by SPSS software-version 11. A probability of $p<0.05$ was considered to be significant.

Results

A total of two hundred and ten poison information queries were answered during the study period. The number of queries answered per year was almost constant during the study period (around 50 queries per year). The majority of the queries (n = 93) were received during the winter season, correlating with the increased number of poisoning admissions during this period. The majority of queries were received from the emergency centre (52%), which was followed by the medicine department. Majority of the queries were received by clinical pharmacists while attending ward rounds with clinicians n=95 (45.2%). Each

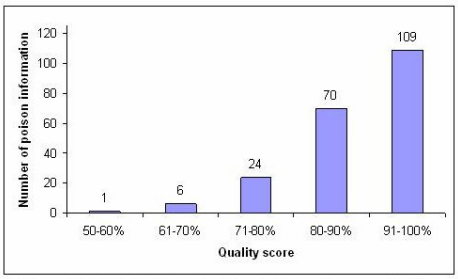
query was categorized into one or more groups based on the type of query *Viz.* management, clinical symptoms, antidotes, identification, toxicodynamic, laboratory or toxicokinetic category. There were 7 main categories and 6 subcategories of information. The query on the management of poisoning was the most common query asked by the clinicians (52%), followed by other categories. 68% of the queries are intended for patient care, while the remaining queries were intended for either updating knowledge or for educational purposes. The assessment of the time required for the response to queries showed that 81% of queries are answered within 2 hours of request for information. Around 8% of queries were answered within 2 to 6 hours and 6 to 24 hours of request for information, respectively [Table/Fig 1].

(Table/Fig 1) Background information on Poison Information requests

S.No	Background Information	Subcategories	% Queries
1	Department generating query	Emergency	52
		Medicine	39
		Others	9
2	Mode of receipt of queries	Ward rounds	45
		Direct Access	36
		Telephone	19
3	Category of query*	Management of Poisoning	56
		Symptoms	36
		Antidote	22
		Identification	15
		Toxicodynamics	12
		Lab monitoring	10
		Toxicokinetics	5
4	Purpose of query	Patient care	68
		Updating Knowledge	30
		Educational purpose	2

* Total percentage exceeded 100 because many queries came under multiple queries.

Quality control tests according to the DSE/WHO seminar [Table/Fig 2] revealed that majority of poison information responses were of excellent grade n=109 (80% or more), 70 were graded between 80-90% while 24 responses were graded as very good (70-80%), 6 responses were graded as good (60-70%) while one query was graded below 50- 60%. Comparison of the year-wise distribution of mean quality scores showed that poison information services had a quality grading of more than 80% in all the four years. The quality scores were significantly ($P<0.05$) higher (9.1±0.6) (Mean ± SD) during the year 2006, while the mean quality was maintained at above 80% in all the years.



(Table/Figure 2) Distribution of poison information queries based on quality

A total of 210 (24.6%) poison information requests were received for the management of poisoned patients out of 933 poisoned patients admitted to the hospital. This accounts for only one fourth of all patients admitted to the hospital due to poisoning or envenomation. The overall mortality rate in four years due to poisoning was 12.3% (115/993). Poison related mortality was least during 2005 (9.9%); followed by a mortality rate of 11.0% during 2003, a mortality rate of 12.2% during 2004 and the mortality rate was highest (15.5%) during 2006. On evaluation of the deaths among patients to whom poison information was provided, it was seen that during the years 2004 and 2005, there was no mortality among the patients for whom poison information was provided. Two deaths (0.9%) occurred during the year 2003, while four deaths (1.5%) occurred during the year 2006. However, on comparison to the overall mortality rate of 12.3% (n=115/933), the mortality rate of poisoned patients for whom poison information were provided, was very low (0.64% - 6/933), indicating the probable benefits of poison information services. [Table/Fig 3].

(Table /Fig 3) Comparison of outcome and benefits of poison information services

	2003	2004	2005	2006	Total
Total number of poisoned patients admitted	218	221	231	265	933
Number of poison information provided	50 (23%)	53 (24.0%)	53 (23%)	54 (20.4%)	210 (22.5%)
Total mortality due to poisoning	24 (11.0%)	27 (12.2%)	23 (9.9%)	41 (15.5%)	115 (12.3%)
Mortality rate of patients to whom PI were provided	2 (0.9%)	0	0	4 (1.5%)	6 (0.64%)

Discussion

The primary objective of poison information services has always been an improvement in the poisoned patient's care and prevention of poisoning. Clinical pharmacists are well positioned to provide specialized services to both public and health professionals alike, so as to ease this public health burden [9]. The concept of a toxicology unit is to provide a multidisciplinary, coordinated, efficient, expert level care to poisoned patients of a given area, with a planned-for-purpose designated location. The goals are, to increase the quality of care by the judicious use of interventions, evidence based up to date knowledge on expert care, coordination between team members and to optimize the use of health care resources by decreasing length of stay, by maximizing bed utilization, by increasing patient satisfaction and by increasing the likelihood for outpatient continuity of care to decrease recurrences[10]. To achieve such goals, poison information centers must continually strive to achieve better quality in services, as the quality service can make a difference in the care of poisoning cases and to save more lives.

Quality Assurance is an important process needed to be performed for continuous improvement[11]. Launching a process to develop and continuously check the standards and the quality of the service, is one step for providing services of the highest possible standards in keeping with the philosophy and mission of the profession[12]. This study was initiated to start a quality assurance system for the existing Poison Information center of the study hospital, by evaluating the services provided by the center and by evaluating outcomes. Quality control tests according to the DSE/WHO seminar have shown that the services provided by the center had an average rating of 80% or more during the study period, which is considered as excellent. This shows that the center has a significant contribution for the quality care of poisoned patients. In a study carried out by Kohli et al on pediatric poisoning, it was suggested that consultation with the poison cell resulted in improved patient management[13]. Our study also substantiates such an observation that in poisoned cases in which the Poison Information Center's help was sought, the mortality rate was less as compared to the cases in which the Poison Information Center was not consulted, when the type of queries and time for response by the Poison Information center shows that most of the queries were regarding the management of poisoning and the center responded in more than 80% of times with appropriate information in less than 2 hours. This observation highlights the role of the Poison Information Center in assisting clinicians in managing poison cases in a timely manner, so as to save the patients' lives.

Conclusion

The evaluation of services of the Poison Information Center according to the DSE/WHO seminar guidelines showed that the majority of services provided during four years of study had a rating of 'excellent' grade, demonstrating the quality of the services. The impact of the poison information services on the outcome of the patients showed a clear reduction in the mortality rate, where these services are utilized. Thus, it can be concluded that the Poison Information Center of the study hospital provided quality services, thereby contributing to quality patient care and reduced mortality.

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