King Saud University

Saudi Pharmaceutical Journal

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PRACTICE REPORT

Development of Clinical Pharmacy services at King Khalid University Hospital and its impact on the quality of healthcare provided

Abdulaziz A. Saddique *

Pharmacy Services, King Saud University Hospitals, P.O. Box 59466, Riyadh 11525, Saudi Arabia

Abstract Clinical Pharmacy is a unique service provided by the leading pharmacy departments in the United States. The concept of Clinical Pharmacy evolved after the significant increase in number of pharmaceuticals in the market and the increasing potential of drug interactions. However, the Clinical Pharmacist is not merely an individual who advises on drug interactions. There are a number of functions which include but are not limited to; the design of appropriate drug therapy, such as Pharmacokinetic assessment and evaluation to optimize drug therapy, drug information dissemination to the physicians and other healthcare providers and participation as a toxicology consultant in Poison management.

At the King Khalid University Hospital (KKUH) the first Clinical Pharmacy services program began in 1983. The aim of this study is to evaluate the impact of our Clinical Pharmacy program on the patients' care as well as its perception by the Medical staff that came from different parts of the world.

Our Clinical Pharmacists were asked to record any suggestions or interventions in the form. The forms were all collected at the end of each day and entered into a database for analysis. Each intervention was analyzed in order to assess the merit of the action in terms of the therapeutic, financial and direct cost impact.

The study showed a positive impact on the patients' care as well as on the economy of the drugs prescribed. Meanwhile, the service was very much appreciated by the Medical staff as well as other healthcare providers.

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* Mobile: +966534466600.
E-mail address: drsaddique1@hotmail.com

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1. Introduction

The pharmacy department at KKUH was the first pharmacy department to implement the Clinical Pharmacy program outside the Continental USA. This unique service was established in 1983 with one clinical pharmacist, following which fifteen Clinical Pharmacists were recruited after the initial trial and the service was expanded to cover all hospital Clinical disciplines. During the initial period of implementation the service was assessed using a questionnaire sent to each physician and nurse for their opinions of Clinical Pharmacists who provide services for their respective areas. This method is biased and does not give an accurate depiction of the services provided by Clinical Pharmacists but rather a personal judgment of an individual.

The clinicians practicing at this institution came from all corners of the globe and most have little or no experience in working with Clinical Pharmacists. Meanwhile, the administrators at KKUH are not familiar with what a clinical pharmacist is capable of achieving in terms of both financial savings for the hospital as well as therapeutic benefits for the patients.

The purpose of this study was to determine what services Clinical Pharmacists are providing, how they are providing them, and the overall quality of these services. Quantification of the information was a priority in order to assure thorough, non-biased results. The information collected is to help us answer the following questions:

- What is the most frequent type of Clinical Pharmacy interaction?
- Who is the primary initiator of the intervention?
- Were the recommendations provided by the Clinical Pharmacists usually accepted, modified, or ignored?
- What time of the day do most interventions occur and how much time is spent on each intervention?
- Of the interventions taking place what percentage is therapeutically beneficial, have no therapeutic benefit or is detrimental to the patient?
- What is the impact of the intervention on immediate direct costs to the health care system?
- What is the long term financial impact of the intervention of the health care system?

2. Methodology

Seven Clinical Pharmacists and two Clinical Pharmacy residents were involved in collecting data for the study over a three month period. Each one was asked to record any suggestions or interventions on a form provided (Fig. 1). The forms were all collected at the end of each day and entered into a database computer program for analysis. Most of the information on the form was self explanatory, and did not require any interpretation. Each intervention was analyzed in order to assess the merit of the action in terms of the therapeutic, financial and direct cost impact.

A suggestion was considered therapeutically positive if it met with the standard of practice for the particular case. For example, adjusting non-therapeutic or toxic Aminoglycoside levels appropriately was considered therapeutically positive.

The financial impact was based on the long-term effect of the intervention. For example in the above case the intervention would be classified as financially positive since optimizing the dose will lead to a more rapid recovery and hence shorten the length of hospitalization. If an inappropriate suggestion had been made this may lead to unnecessarily prolonged hospitalization and increased cost to the health care system.

Direct cost was defined as the immediate effect of the intervention on the health care system regardless of the long-term financial impact. For example if a clinical pharmacist requested an Aminoglycoside serum concentration determination, this will result in increased direct costs, although the concentration may be sub therapeutic and necessitate subsequent dosage modification.

All interventions were analyzed by three Clinical Pharmacists until a consensus was reached concerning the impact of the intervention. Each intervention was designated as either positive, negative, or having no effect on the therapeutic, long-term financial and direct cost criteria defined above.

3. Results

A total of 8796 interventions were documented during the three month period (five working days a week). Interventions occurred throughout the hospital encompassing 28 wards (including all intensive care units), IV pharmacy, Drug and Poison information Center (DPIC), outpatient pharmacy, non hospital related clinics, hospital related clinics and in the homes of several Clinical Pharmacists. The DPIC had the most number of documented interventions with 900 interventions.

Therapeutic and dosing administration interventions were the most frequently encountered and accounted for nearly 60% of all interventions, followed by Pharmacokinetic and total parenteral nutrition interventions, which accounted for 9% and 9.5% of interventions, respectively. Availability, supply, and miscellaneous interventions accounted for approximately 6% of interventions each. Side effects, adverse drug reactions, educational, pregnancy and lactation, interactions and compatibility, and poisoning interventions accounted for less than 5% each of the total interventions.

Of all interventions, Clinical Pharmacists initiated 43%, physicians 42%, nursing staff 5.5%, satellite pharmacists 5.4% and other personnel 4.1%. 86% of the suggestions made by Clinical Pharmacists were accepted and only 2% modified and 3% ignored. Nine percentage of interventions did not produce a suggestion that required acceptance; hence these were labeled as not applicable.

Analysis of the therapeutic merit of the interventions shows that 90% of the interventions had a positive therapeutic impact while 9% had no therapeutic impact and 1% had a negative impact.

Immediate direct costs increased due to the intervention in 27% of the cases. No effect on direct cost and a decrease in direct costs were seen in 50% and 23% of the cases, respectively.

Long term financial impact of the interventions was positive (reduce healthcare costs) in 96% of the cases, increased in 1% and had no effect in 3%.

The average time involved by a clinical pharmacist was 9.59 min per interventions with a range of 1–240 min. The time of the day in which most interventions occurred was 10 am