DRUG UTILIZATION EVALUATION STUDY IN IN-DIAN HOSPITAL

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ABSTRACT
OBJECTIVES: This study was designed to identify the prescribing irrationalities and appropriate action have to be taken to reduce the irrational use of drugs and improve the prescribing pattern for rational use of drugs **METHODS**: Retrospective data from 01-08-03 to 31-07-04 and prospective data from 01-08-04 to 31-08-05 were collected and analyzed for the use of drugs. The prospective data were used to design intervention to change prescribing behavior and evaluate the outcome of results. The prospective statistical analysis consists of the names and quantities of drugs used for a year as well as the annual number of patient days. **RESULTS**: Two major prescribing irrationalities were observed after an analysis of use of individual drugs and drug groups. Ranitidine use was 1840.00 DDD/1000 PD during 2003-2004 increasing to 2575.67 DDD/1000 PD during 2004-2005 and Ibuprofen use was 573.66 DDD/1000 PD during 2003-2004 increasing to 606.25 DDD / 1000 PD during 2004-2005 at Rajah Muthiah Medical College & Hospital **CONCLUSIONS**: The result shows that the no need for prophylactic use of ranitidine in short term NSAID therapy in patient without any history of ulcer diseases and the therapeutic use of ibuprofen have to be prescribed careful after assessment of the risks and benefits in each patient is essential.

INTRODUCTION

Drug use is a complex process. Uncertainties in diagnosis, treatment and medication adherence may contribute to wide variation in the way drugs are used for any given condition. In any country a large number of socio cultural factors will also contribute to the way drugs are used.

In India these include National Drug Policy, literacy, and poverty, use of multiple health care systems etc. The complexity of drug use means that optimal benefits of drug therapy in patient care may not be achieved because of under use, overuse (or) misuse of drugs.

Drug use evaluation is designed to

Ø Review drug use and /or prescribing patterns.
Ø Provide feedback of results to clinician and other relevant groups.
Ø Develop criteria and standards, which de scribe optimal drug use.

Promote appropriate drug use through education and other interventions.

Qualitative drug utilization evaluation studies are multidisciplinary operations, which collect, organize, analyze and report information on actual drug usage. They are usually one of the examinations of narrowly defined areas of drug use, usually specific drugs. This type studies include the concept of criteria. Drug use criteria may be based upon indications for use, dose, frequency, duration of drug use and amount of drug use.

Very few studies of drug use have been reported from developing countries. But in August 2003, In Rajah Muthiah Medical College & Hospital in Chidambaram began a study to analyze drug usage in patients.

Rajah Muthiah Medical College & Hospital is a tertiary level teaching hospital with 28 wards, and 1010 beds, with patients coming from in and around Chidambaram. In line with WHO recommendations for such studies, researchers are using the "Anatomical Therapeutic Chemical Classification System" It is the measuring unit of the number of daily defined doses per thousand patient days (DDD/1000 patient days).

A DDD is the "Typical average maintenance doses of a drug" used to treat the most common medical problem for which the drug is prescribed. Its use facilitates

comparison and discussion of differences in drug use in internationally accepted units1 - 4.

Retrospective data from 01-08-03 to 31-07-04 were collected and analyzed for the use of drugs and prospective study was carried over a period from 01-08-04 to 31-07-05. The prospective data was used to design intervention to change prescribing behaviour pattern and to evaluate the outcome of interventions.

The statistical analysis consists of the names and quantities of drugs used for a year as well as the annual number of patient days (the sum of all days which all patients spent in a hospital for a year).

The total quantity of a drug used is divided by the DDD for that drug and the number of DDDs used for a year is calculated. This number is further divided by the Number of 1000 days that all patients (PD) have spent in Rajah Muthiah Medical College & Hospital. Finally the drug utilization is impressed in number of DDD used per 1000 patient days2 & 5.

METHODS3

The following steps involved in the study of drug utilization evaluation.

Steps involved

Ø   Planning
Ø   Data collection
Ø   Evaluation
Ø   Feed back of results
Ø   Interventions
Ø   Re evaluation
Ø   Feed back of results

1) Planning
a) Identify Drugs

Focused on drugs with a high volume of use, high cost (or) a high frequency of adverse drug events. E.g.

Ø   Commonly prescribed drugs Eg. Antibiotics.
Ø   Expensive drugs Eg. Low molecular weight heparins
Ø   New drugs

More drugs are usually identified in this step. The final choice will ultimately be determined by evidence of a drug use problem with in the institution and the interventions being successful in improving drug use.

b) Design of study

A variety of research methods have been used in drug utilization studies. Observational research methods are more commonly used than experimental methods. Cross sectional studies, where drug use is examined at a single point in time, are useful for problem identification.

c) Criteria and standards

Criteria are those predetermined statements describing optimal drug use against which the quality of actual drug use is compared. Criteria should be scientifically based and supported by clinical (or) research literature. They must be valid, realistic, easily measured and outcome oriented.

Standards are professionally developed expressions of the range of acceptable variation from criteria. Standards should also be based on published literatures.

2) Data collection

Data collection should be chosen carefully, knowledge of drug names, strength and the way orders are written is also important. Depending upon their availability, physicians, pharmacists and nurses make ideal data collectors. Another concern is the timing of data collection. This should be done during a period which is likely to be representative of usual patterns of drug use.

3) Evaluation

Data evaluation is one of the most critical steps. The data obtained should be collected using available resources and then summarizes the major categories of results. If there is any deviation is found out from this data, then the reason for this deviation should be evaluated.

4) Feed back of results

The outcome of any drug utilization evaluation strategy depends up on   prescriber and other health care hospital staffs, involved in the study and to administrative heads. The presentation of report is also very important. The report should be well presented and well reasoned document with no grammatical (or) typographical errors. The results can also be circulated to hospital staff via newsletters.

5) Interventions

If a drug use problem identified, the next step is to consider how the problem can be addressed. Interventions to improve drug use can be educational, operational or only those prescribers who did not meet drug use criteria.

Educational interventions consist of educating meetings, circulation of protocols, feed back of study

results, and letters to individual physician, newsletters and other informational materials.

Operational interventions include the development / modification of drug order forms, prescribing restrictions, academic detailing, formulary additions /deletions or reallocation of staffs. The choice and development of interventions requires careful planning. The primary causes of the drug use problem need to be identified.

6) Reevaluation

Drug use and prescribing patterns need to be monitored to determine the success of interventions. Typically the re evaluation is done 3 to 12 months after the introduction of the intervention and should involve collecting the same data as in the original evaluation.

7) Feedback of results

It is important to circulate the results of the drug utilization evaluation studies to the clinicians and other health care hospital staffs involved in the studies.

Conclusion

The 20 most used drugs are shown in table. Overall drug utilization in Rajah Muthiah Medical College & Hospital was 4833.90 during 2003-2004 and 6043.06 during 2004-2005. On average each patient received 4-6 drugs daily. In comparison with Osmania general hospital, Hyderabad the drug utilization was 4426.66 DDD/ 1000 patient during 2000-2001 and 4484.35 DDD/1000 patient6.

At the Rajah Muthiah Medical College &Hospital two major prescribing irrationalities were observed after an analysis of use of individual drugs and drug groups.

Ranitidine

Ranitidine use was 1840.00 DDD/1000 patient days during 2003-2004 increasing to 2575.67 DDD/

Table.1. Analysis of Use of Individual Drugs and Drug Groups

Name of the drug	2003 –2004 DDD/1000 PD	Name of the Drug	2004-2005 DDD/1000 PD
Ranitidine	1840.00	Ranitidine	2575.67
Ibuprofen	573.66	Ibuprofen	606.25
Mebendazole	380.00	Pyridoxine	481.25
Pyridoxine	362.25	Mebendazole	435.00
Phenytoin sodium	326.67	Phenytoin sodium	358.83
Phenobarbitone	285.00	Doxicycline	314.00
Doxicycline	231.50	Phenobarbitone	220.00
Paracetamol	144.80	Paracetamol	213.37
Tetracycline	124.60	Ferrous sulphate	156.00
Ampicillin	111.10	Ampicillin	147.75
Ciprofloxacin	109.30	Tetracycline	139.10
Ferrous sulphate	73.88	Ciprofloxacin	95.30
Diethyl carbamazepin	71.30	Diethyl carbamazepin	72.00
Rifampicin	51.67	Rifampicin	67.17
Isoniazid	36.67	Isoniazid	53.33
Pyrazinamide	31.33	Pyrazinamide	36.00
Chlorheniramine maleate	25.81	Metronidazole	24.33
Metronidazole	23.90	Acetyl salicylic acid	18.07
Acetyl salicylic acid	17.77	Metformin	15.70
Vitamin B Complex	12.69	Vitamin B complex	13.94

PD during 2004-2005 at Rajah Muthiah Medical College &Hospital. Ranitidine is prescribed as prophylaxis against NSAIDs induced ulcers, treatment of peptic ulcers gastro esophageal reflux disease and non-ulcer dyspepsia. Prophylactic use of ranitidine is not needed in the case of with short term NSAIDs therapy in patients without any history of ulcer7.

Ibuprofen

The use of ibuprofen during 2003-2004 was 573.66 DDD/1000PD and it increased to 606.25 DDD/1000 PD during 2004-2005. In Rajah Muthiah Medical College & Hospital there is wide spread use of ibuprofen, which cames therapeutic side effects such as peptic ulceration, epigastria distress, heart burn, prolonged bleeding time, anemia, bronchospasm and Steven Johnson syndrome. These side effects are potentially life threatening and a careful assessment of the risks and benefits in each patient is essential8.

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