

STUDY OF DRUG UTILIZATION PATTERN IN A TERTIARY CARE HOSPITAL DURING THE INPATIENT ADMITTANCE IN THE EMERGENCY CARE DEPARTMENT

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Received: 7 October 2013, Revised and Accepted: 2 November 2013

ABSTRACT

Objective: To study the drug utilization pattern in a tertiary care hospital during the inpatient admittance in the emergency care department.
Methods: This prospective observational study was conducted in a tertiary care hospital for a period of one month, where the medical records of 138 hospitalized patients were reviewed for analyzing the prescription pattern during an average stay of 6 hours at the hospital.
Results: A total of 360 drugs were used in 138 prescriptions, with an average of 2.60 (\pm 1.41) drugs per prescription. There was a potency of drug-drug interactions in 24 cases. Male gender was more predominately admitted when compared to the female gender. The most common route of administration of drugs was found to be intravenous injection (42.2%). Generic drug usage (27%) was found to be low when compared to brand drug usage (73%). Of all the drugs prescribed 88.8% of the drugs abided to the WHO essential drugs list.
Conclusion: The prescription pattern of drugs showed polypharmacy as a concern with possibilities of drug-drug interactions in some of the cases which can be avoided.

Keywords: Prescription, Emergency care, Polypharmacy, Drug Interactions, Clinical Pharmacist.

INTRODUCTION

Drugs today play an important role in protecting, maintaining and restoring one's health. The science of prescribing or prescription writing is a mode of conveying the drug message from a prescriber (usually a Registered Medical Practitioner or a Pharmacist) to the patient [1]. A clinical pharmacist is a member of the health care team who provides patient oriented pharmaceutical care and monitors the pharmacotherapy given to a patient [2]. Irrational prescribing of drugs may tend to produce an unproductive and a risky treatment to an individual; such a prescription may exacerbate or prolong the illness making higher the costs of treatment or both. On the other hand using a rational drug prescription would see to a least number of drugs being used and also to obtain the best possible therapeutic effect of the drug in short time with a reasonable cost [3]. Clinicians often face challenges in prescribing the right medication and initiating the right therapy, especially when it comes to emergency care department and that's where the chances of irrational prescriptions and errors usually happen [4, 5]. Hence, it would be better to stick on to prescribing drugs by their generic names as it has been emphasized by the WHO in their essential drug list [6]. This study was designed to analyze the prescribing patterns and trends to understand the drug utilization pattern at the emergency care department at a tertiary care hospital in the city.

MATERIALS AND METHODS

This prospective observational study was carried out at a 300 bedded tertiary care hospital at Chennai for a period of one month from December 2012 to January 2013. The necessary permissions regarding this study were obtained from the concerned authorities for the data collection followed by an average time stay of 6 hours a day was permitted. The data collected from the prescription(s) were properly noted in a separate data collection form. The following parameters amongst all age groups such as: age and gender wise segregation of prescriptions, distribution based on patient allergies and social habits, total number of drugs prescribed, generic drug usage, average number of drugs per prescription, common routes of administration, common complaints and the drug(s) of choice, systemic diagnosis and their first line therapy, percentage of drugs abiding to the WHO essential drugs list, average number of antibiotics per prescription, percentage of drugs prescribed as per

WHO prescribing indications, possibilities of drug-drug interactions were noted and assessed.

Inclusion criteria: Patients who were admitted as inpatients and patients who stayed a minimum of 6 hrs at the hospital.

Exclusion criteria: Patients who came for minor injuries, out patients, deaths and patients who needed immediate surgical management.

Based on the inclusion and exclusion criteria 182 patients were admitted and 44 were excluded leading to data collection from 138 prescriptions only

Statistical Analysis

All the collected data were statistically analyzed using online Graph pad software

RESULTS

In this study comprising of 182 patients, 138 patients were selected on the basis of inclusion and exclusion criteria. Data of 138 patients were collected, of which 83 were males and 55 were females. These patients were further categorized into various age groups as shown in Table 1. History of patient allergies and their social habits are shown in Table 2.

Table 1: Age and Gender wise distribution

| S.No. | Age group (in years) | Sex | | Total number of population (n=138) | Percentage (%) |
|-------|-------------------------|----------------|------------------|------------------------------------|----------------|
| | | Male (n=83) | Female (n=55) | | |
| 1 | 0-10 | 9 | 3 | 12 | 8.69 |
| 2 | 20- Nov | 4 | 5 | 9 | 6.52 |
| 3 | 21-30 | 40 | 30 | 70 | 50.72 |
| 4 | 31-40 | 13 | 3 | 16 | 11.59 |
| 5 | 41-50 | 6 | 2 | 8 | 5.79 |

| | | | | | |
|---|-------|---|---|----|------|
| 6 | 51-60 | 4 | 4 | 8 | 5.78 |
| 7 | 60-70 | 5 | 5 | 10 | 7.24 |
| 8 | 71-80 | 1 | 2 | 3 | 2.17 |
| 9 | 81-90 | 1 | 1 | 2 | 1.44 |

Table 2: Distribution based on history of patient allergy and social habits

| S.No. | Parameters | Total number of patients (%) |
|-------|---------------|------------------------------|
| 1 | Allergies | |
| | (i) Drug | 6 (4.3) |
| | (ii) Food | 7(5.07) |
| 2 | (iii) None | 125 (90.05) |
| | Social Habits | |
| | (i) Alcoholic | 27 (33.3) |
| | (ii) Smoker | 46 (19.5) |
| | (iii) None | 65 (47.10) |

Of the 138 prescriptions, total number of drugs prescribed was found to be 360 drugs. Average number of drugs was 2.60 (\pm 1.41) drugs per prescription. Generic drug usage was found to be less (37.63%) compared to the brand drug usage (62.37%). The drug utilization pattern practiced at the emergency care department is shown in Table 3.

Table 3: Prescription details of patients admitted at the emergency care department

| Details of prescription | Number (%) |
|---|---------------------|
| Total number of drugs prescribed | 360 |
| The number of analyzed prescription | 138 |
| Average number of drugs per prescription was found to be | 2.60 (\pm 1.41)* |
| Number of drugs prescribed from the WHO list out of total number of drugs prescribed | 61 (16.94) |
| Number of drugs prescribed by generic name out of total number of drugs prescribed | 99 (37.63) |
| Number of injections prescribed out of total number of drugs prescribed | 243 (67.5) |
| Total number of times the antibiotics prescribed out of total number of drugs prescribed | 54 (15) |
| Average number of antibiotics per prescription | 0.39 (\pm 1.11)* |
| Total drugs prescribed in accordance to WHO prescribing indications irrespective of brand and generic names | 341(94.4) |

*The Standard deviation in this was found out via Microsoft Excel spreadsheet

Intravenous (IV) route of administration was found to be higher (42%) followed by intramuscular (IM) route of administration (4.74%). The other routes of administration of the drugs in the emergency care department are discussed in Table 4. The most common complaints of which the patients were admitted in the emergency care department and their drug(s) of choice are discussed in Table 5.

Table 4: Common routes of administration of drugs

| S.No. | Routes Administration | Number of Drugs (n=360) | Percentage (%) |
|-------|-----------------------|-------------------------|----------------|
| 1 | IV | 152 | 42.2 |
| 2 | IM | 89 | 24.74 |
| 3 | Oral | 72 | 20 |
| 4 | Nasal | 34 | 9.44 |
| 5 | Sublingual | 1 | 0.27 |
| 6 | Subcutaneous | 2 | 0.55 |
| 7 | Topical | 3 | 0.83 |
| 8 | Other | 7 | 1.94 |

Table 5: Common complaints and the drug(s) of choice

| S.N o. | Common complaints | Drug choice | Number of prescriptions (n=138) | Total number of prescriptions, (%) |
|--------|------------------------|------------------------------------|---------------------------------|------------------------------------|
| 1 | Fever | Paracetamol | 14 | 23 (16.66) |
| | | Diclofenac | 9 | |
| | | Ondansetron | 12 | |
| 2 | Nausea/vomiting | Domperidone | 2 | 14 (10.14) |
| | | Pantaprazole | 7 | |
| 3 | Abdominal pain | Drotaverin | 3 | 13 (9.42) |
| | | Onadansetron | 3 | |
| 4 | Chest discomfort | Salbutamol | 4 | 6 (4.34) |
| | | Budesonide | 2 | |
| 5 | Dyspnoea | Salbutamol | 6 | 10 (7.24) |
| | | Budesonide | 4 | |
| 6 | Road traffic accidents | Tetanus | 10 | 20 (14.49) |
| | | Toxoid | 4 | |
| | | Diclofenac | 10 | |
| 7 | Giddiness | Prochlorperazine | 4 | 8 (5.79) |
| | | Ondansetron | 4 | |
| 8 | Cough | Amoxicillin+potassium clavulinate, | 2 | 4 (2.89) |
| | | Budesonide | 2 | |
| 9 | Seizures | Fos Phenytoin | 3 | 5 (3.62) |
| | | Lorazepam | 2 | |
| 10 | Wheezing | Budesonide | 2 | 2 (1.44) |
| | | Animal Bites | 4 | |
| 11 | Animal Bites | Rabies Vaccine | 4 | 4 (2.89) |
| | | Others | 44 | |
| 12 | Others | Miscellaneous | 44 | 44 (31.88) |

From the analysis of 138 prescriptions, the commonly associated diagnosis was found to be gastrointestinal tract (GIT) associated disorders followed by respiratory tract disorders. Table 6 depicts the diagnosis and their first line drug therapy.

Table 6: Diagnosis vs. First line drug therapy

| S.N o. | Diagnosis | First line drugs | Number of prescriptions (n=138) | Total number of prescriptions (%) |
|--------|-----------------------|------------------|---------------------------------|-----------------------------------|
| 1 | GIT associated | Pantoprazole | 16 | 32 (23.18) |
| | | Drotaverin | 7 | |
| | | Ondansetron | 9 | |
| 2 | Respiratory Tract | Levo-salbutamol | 15 | 23(16.66) |
| | | Budesonide | 4 | |
| | | Salbutamol+ | 4 | |
| | | Ipratropium | 4 | |
| 3 | Fever | Paracetamol | 14 | 21(15.21) |
| | | Diclofenac | 9 | |
| 4 | Road traffic accident | Tetanus | 10 | 20(14.49) |
| | | Toxoid, | 10 | |
| 5 | Neurological | Diclofenac | 10 | 5(3.62) |
| | | Fos | 3 | |
| 6 | Cardiac System | Phenytoin | 2 | 4(2.89) |
| | | Lorazepam | 2 | |
| 7 | Animal Bite | Adrenaline | 2 | 4(2.89) |
| | | Atropine | 2 | |
| 8 | Reproductive System | Rabies Vaccine | 4 | 4(2.89) |
| | | Dicycloverine | 2 | |
| 8 | Reproductive System | Dicycloverine | 2 | 2 (1.44) |
| | | Others | 44 | |

| | | | | |
|----|----------------|------------------------------|----|----------|
| 9 | Urinary System | Hydrochloride | 2 | 4(2.89) |
| | | Furosemide | | |
| 10 | Pain | Hyoscine butylbromide | 2 | 4(2.89) |
| | | Diclofenac | | |
| | | Paracetamol | | |
| 11 | Burns | Silver-sulfadiazine ointment | 2 | 4(2.89) |
| | | Tramadol | | |
| 12 | Osseous system | Diclofenac | 2 | 4(2.89) |
| 13 | Others | Other drugs | 11 | 11(7.97) |

DISCUSSION

In this present study, the drug use pattern of emergency care drugs was studied in a tertiary care hospital for a period of one month. Higher male patients were admitted to the emergency care department when compared to the female patients. Subjects in the age group of 21-30 years were more in number than any other age group. Of the patients admitted 6 (4.3%) had a drug allergy of which 3 were known to have penicillin allergy whereas 7 patients (5.07%) had food allergies mentioned in their case sheets. Of the social habits concerned, 46 patients (33.3%) were alcoholics and 27 patients were smokers (19.5%) as mentioned in their case history. It is very well known that alcohol can cause changes in liver which can alter the drug metabolism of an individual [7]. In a total of 138 cases, a total of 360 drugs were prescribed, of which a majority of the drugs were purely prescribed based on the brand names. Use of brand names were more frequent and could be as a result of various promotional strategies from different pharmaceutical companies trying to ace their products. Prescribing drugs by generic name would become easy for the hospital to have maintenance over its regulatory stock and would also lower the cost of treatment for the concerned individuals. The average number of drugs per prescription were very slightly on a higher side, 2.60 (\pm 1.41), whereas the WHO recommends an average number of drugs per prescription to be 2.0 [8]. Total number of generic drugs prescribed abided to the WHO essential drugs list was 16.94%. The most commonly used drug which didn't abide to WHO essential drugs list was diclofenac, cause of its known chances of causing myocardial infarction and other undesired cardiac effects, hence it was taken off from the Essential Drugs List [9]. The other drugs prescribed abided well to the WHO prescribing indications (94.4%) [10]. A total of 54 antibiotics were prescribed, with an average of 0.39 (\pm 1.11) per prescription. The most commonly prescribed antibiotic was amoxicillin (18.75). Intravenous route remained the most common route of administration (42%) in order to achieve a fastest pharmacological effect of the drug. The most common complaints amongst the admitted patients at the emergency department was fever (16.66%) followed by road traffic accidents (14.49%). The most common systemic diagnosis was gastro intestinal tract oriented (23.18%) followed by respiratory tract ailments (16.66%). Of the drugs prescribed, pantoprazole and ondansetron were among the top two common drugs prescribed accounting to 11 and 9.7%, respectively. The frequent explanation given is gastrointestinal prophylaxis in order to inhibit gastric acid secretion and chances of nausea and vomiting in a majority of the cases [11, 12]. When checked for drug-drug interactions via Medscape online drug interaction checker, the possibility of drug-drug interactions were seen in a total of 24 cases (17%) of the 138 cases of which 16 could produce a moderately high drug-drug interaction [13]. There could be a controversy, when it comes to drug-drug interactions, because some drugs need to be prescribed at the time of emergency and the acceptance by the physician remains a matter of concern. The possibilities of drug-drug interactions can be avoided by the presence of a clinical pharmacist in the emergency department who can make the necessary changes in the prescription or help the doctors prescribe better medications and reduce polypharmacy. Also, they can reduce the prescription cost and chances of any drug-drug interactions during the course of the therapy.

In some previous studies done in quite similar manner, they showed polypharmacy, irrational prescribing and cost per prescription, but none pointed at the importance of a clinical pharmacist at the emergency care department as shown in this study [1, 3-5].

CONCLUSION

From the present study it is concluded that generic drug usage was low when compared to the brand drug usage. Polypharmacy still remains a matter of concern in most of the cases. The possibilities of drug-drug interactions and some irrational prescription writing were also seen at the emergency care department, all pointing towards irrational prescription. Further studies are required to confirm the results in a larger population and to study the impact of clinical pharmacist in the emergency care setting for optimizing patient drug therapy.

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