Drug utilization review of corticosteroids in a tertiary care hospital of Salem District, Tamilnadu, India

Arul Balasubramanian, Rinson Reji, Rosmy Jose, Sarika Sasidharan, Kothai Ramalingam*

Department of Pharmacy Practice, Vinayaka Mission's College of Pharmacy, Vinayaka Mission's Research Foundation (Deemed to be university), Salem-636008, Tamilnadu, India

ABSTRACT

Corticosteroids are widely used compounds for allergic reactions, autoimmune diseases, inflammatory conditions, hormone replacement therapy etc. Hence, with widespread use and actions, these have several interactions with drugs and diseases. The purpose of this study was to obtain information about Corticosteroids prescribing and utilization pattern, to understand the prescribing behaviour of physicians and to identify drug interactions. A retrospective observational study was conducted in the department of dermatology and general medicine in a tertiary care hospital for 6 months. All the patients receiving any category of steroid therapy were included, and the prescribing and tapering pattern of steroids were reviewed. Drug utilization pattern (DUR) was observed and analysed among 150 patients during the study period. The results revealed that steroids were prescribed for various respiratory illnesses (66%) and skin-related conditions (34%). The steroid utilization was found to be more in elderly patients, particularly in males. Intravenous administration was common in 33% of cases. Budesonide was the most commonly prescribed steroid (36%), followed by Hydrocortisone (24%) and Dexamethasone (14%). The most frequent drug-drug interaction was between Hydrocortisone and Theophylline as well as Hydrocortisone and Hypoglycaemic agents. Most drugs were prescribed rationally, although some factors like prescribing drugs in the brand name, without mentioning route of administration, frequency and dose were deviating away from rationality. Not much variation was found in the pattern of prescription amongst healthcare professionals. Although most of the drugs were prescribed rationally, the involvement of a clinical pharmacist in patient care can help in more rational prescribing along with prevention and early detection of ADRs which can directly promote drug safety and better patient outcomes.

INTRODUCTION

Corticosteroids are an important class of naturally occurring and synthetic steroid hormones that affect virtually every aspect of human physiology (Gupta and Vijayalakshmi, 2008). The cortex of the adrenal glands produces corticosteroids. There are two main forms- glucocorticoids and mineralocorticoids. The actions of glucocorticoids include gluconeogenesis, fat deposition, sodium retention, decrease the protein synthesis and immune response. Examples of glucocorticoids are Cortisol (Hydrocortisone), Prednisolone and Dexam-
Ethasone. Mineralocorticoids, such as Fludrocortisone, mainly act on the extracellular balance of sodium and potassium in the distal tubule of the kidney (Clark and Parveenkumar, 2016).

Corticosteroids are highly efficacious drugs for the treatment of various autoimmune, respiratory and dermatological conditions. However, these may show harmful effects when used for a longer duration of time. The dose of corticosteroids that are prescribed, dispensed and applied must be carefully considered as too little dose can show poor response whereas excess dose can increase the risk of adverse drug reaction (Ference and Last, 2009). Corticosteroids have several side effects/adverse effects and interactions with other drugs. It is recommended that use of these drugs should not be stopped abruptly, but rather, they should be stopped gradually (Gupta and Vijayalakshmi, 2008).

In India, most of the topical corticosteroids are sold without any prescription or patients can quickly obtain these medications from the local pharmacies. As per the information available on the Central Drugs Standard Control Organization (CDSCO) website, it’s off-label use is more commonly practised in India (Dora et al., 2013). With the wide variation of marketed formulations and drugs available, there are several factors which affect the overall intended benefit to the patients. These factors are Interaction of drugs with food or disease, therapeutic duplication, errors in dosage and duration of drugs which can be studied under the Drug Utilization Review (DUR) (Peng et al., 2003). DUR is defined as an authorized, structured, review of practitioner prescribing, pharmacist dispensing and patient use of medications (Parthasarathi et al., 2012).

The main aim of the study is to analyse the DUR of corticosteroids among the patients from general medicine and dermatology department of VMKV Medical College and Hospitals located in Salem district, Tamil Nadu, India. The long-term use of steroids can increase the risk of adverse effects; hence, the significance of the study is to improve patient safety by observing the prescribing pattern.

MATERIALS AND METHODS

Study Design

A retrospective observational study was conducted for 6 months duration from November 2017–April 2018. A total of 150 prescriptions were collected according to the inclusion and exclusion criteria. Drugs prescribed were rigorously analysed for drug interactions and other parameters.

Study Site

Department of General Medicine and Department of Dermatology, VMKV Medical College and Hospitals, Salem District, Tamil Nadu, India.

Inclusion Criteria

Patients aged above 18 years who received steroid therapy and the patients who presented a history of steroid intake were included.

Exclusion Criteria

Pregnant and lactating women were excluded from the study.

Statistical Analyses

The collected data were statistically analyzed using SPSS.

RESULTS AND DISCUSSION

Corticosteroids are commonly used for the treatment of many inflammatory and autoimmune conditions. Rational prescribing of the drugs is essential to increase the therapeutic efficacy and to decrease the adverse effects of the drugs. The purpose of drug utilization review was to ensure that the drugs are being used appropriately, safely and effectively to improve patient health status. Also, continual improvement in the appropriate, safe and effective use of drugs may reduce the overall cost of care (W.H.O, 2003).

A total of 150 patients were enrolled and out of which, 50 patients were from the Dermatology department, and 100 patients were from General Medicine department. Majority of the study subjects who participated in this study were belonging to the age group of 41-50 years. In this study, it was analysed that male patients were more prescribed with steroids than female patients.

The corticosteroids were prescribed for 241 times, in the total of 150 prescriptions, in which budesonide (36 %), hydrocortisone (24 %), dexamethasone (14 %), prednisolone (12 %), betamethasone (8 %), clobetasol (5 %) and methylprednisolone (1 %) were commonly prescribed (Table 1). It was also analysed that the corticosteroids prescribed more among the middle-aged peoples. This data was in accordance with the earlier study results on Steroids utilization (Aryal et al., 2017).

Out of 150 cases collected, the number of corticosteroids per prescription was 2 (53%).
Table 1: Analysis of prescriptions for the most commonly prescribed corticosteroids

<table>
<thead>
<tr>
<th>Drugs name</th>
<th>Frequency (N=241)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budesonide</td>
<td>87</td>
<td>36%</td>
</tr>
<tr>
<td>Hydrocortisone</td>
<td>59</td>
<td>24%</td>
</tr>
<tr>
<td>Dexamethasone</td>
<td>33</td>
<td>14%</td>
</tr>
<tr>
<td>Prednisolone</td>
<td>29</td>
<td>12%</td>
</tr>
<tr>
<td>Betamethasone</td>
<td>9</td>
<td>8%</td>
</tr>
<tr>
<td>Clobetasol</td>
<td>11</td>
<td>5%</td>
</tr>
<tr>
<td>Methylprednisolone</td>
<td>3</td>
<td>1%</td>
</tr>
<tr>
<td>Total</td>
<td>241</td>
<td>100%</td>
</tr>
</tbody>
</table>

The most commonly prescribed steroid was Budesonide followed by Hydrocortisone and Dexamethasone. Corticosteroids were prescribed commonly for COPD patients (21%) followed by bronchial asthma (19%), LRTI (16%), bronchitis (7%) and others (3%), in General Medicine department (Figure 1).

In Dermatology department, the corticosteroids were prescribed commonly for psoriasis patients (10%) followed by pemphigus vulgaris (8%), eczema (5%), bullous pemphigoid (5%), others (5%). Corticosteroids were mostly administered through intravenous dosage form (38%) followed by inhaler (33%), oral (16%) and topical (13%). Most of the corticosteroids were prescribed by parenteral route followed by inhaler, oral and topical route. The possible reason for the high use of parenteral could be the beliefs and attitudes of patients and physicians about the high efficacy of injections as compared to oral medications.

Out of total corticosteroids prescribed, the approach of therapy was found to be more in monotherapy than combination therapy. Out of 150 prescriptions collected, 90 (60%) prescriptions were found without drug interactions, and 60 (40%) prescriptions were found with drug interactions. This shows the intense need for clinical pharmacists, who will help in detecting drug interactions.

It was observed that 8 (12%) interactions were between hydrocortisone and theophylline as well as hydrocortisone and hypoglycaemic agents (Figure 2). Hydrocortisone decreases the level of theophylline by affecting hepatic or intestinal enzyme CYP3A4 metabolism similarly, and Hydrocortisone decreases the effects of hypoglycaemic agents by pharmacodynamic antagonism (Mani and Kosey, 2015).

Among 150 cases collected, all the prescriptions were prescribed by mentioning the dose, route of administration and frequency. This data was in accordance with the earlier study reports (Aryal et al., 2017) (Mani and Kosey, 2015).

Prescribing in the generic name will rationalize the use and also reduce the cost of the drug. It also reduces confusion relating to drug name, cost, and stock items. In this study, most of the drugs were prescribed by generic name rather than a brand name. Using generic names usually provides flexibility to the dispensing pharmacist, and generic drugs are less expensive than branded drugs (Oshikoya et al., 2008). However, some factors like inappropriate drug history, missed drug doses, missed frequency, wrong administration, dose omission, illegible handwriting, lack of dose tapering and steroid abuse were deviating from rationality. Not specifying these factors can lead to under usage of the medication and can lead to a sub-therapeutic outcome and at the same time excessive usage can lead to unwanted effects (Ference and Last, 2009).

Some patients were found to be using steroids unnecessarily due to a lack of knowledge towards medication. Clear instructions should be provided so that the patients may be aware of how much steroid...
should be used and how long it should be used (National Prescribing Service, 1999).

CONCLUSION

From the above study, it may be concluded that the steroid utilization pattern in general medicine and dermatology was more, in which the corticosteroids were prescribed for 241 times. The present study also shows that steroids were prescribed mostly for COPD in general medicine and for psoriasis in the dermatology department and the most commonly prescribed corticosteroid was budesonide.

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REFERENCES


