INTRODUCTION
Corticosteroids have wide range of indications including chest diseases, inflammatory bowel disease, rheumatoid arthritis, renal diseases etc. Therefore, they are extensively prescribed to patients for the treatment of various diseases. But the corticosteroids should be prescribed carefully keeping in view the chances of possible drug-drug interactions. Metabolic pathways and transport systems in human body are greatly affected by corticosteroid use especially when they are used in combination with other drugs. No enough data is available that reports drug interactions related to the frequently used drugs like corticosteroids. It is important to educate health professionals regarding the safe use of corticosteroids. A single prescription may have more than one interacting combinations, some of which may be clinically significant. Chances of drug interactions increase with the increase in number of drugs in a prescription. This also leads to ineffective treatment. Patients on corticosteroid therapy should be monitored closely for adverse drug reactions as well as drug interactions. 11.3% of the patients admitted to hospital are due to drug interactions.

METHOD
The study was conducted in Aziz Bhatti Shaheed DHQ hospital Gujrat. The aim of the study was to see how frequently corticosteroids are prescribed to the indoor patients. Moreover, corticosteroid related drug-drug interactions in these prescriptions were separated and studied for their clinical importance. The different types of corticosteroid related drug-drug interactions, their possible toxic effect were studied. The recommendations to avoid the toxic effects due to drug-drug interactions were also given. This was done with the help of drug interaction study software named THE MEDICAL LETTER ADVERSE DRUG INTERACTION PROGRAM. Moreover, the results were analyzed with the help of Microsoft excel.

RESULTS
79 out of 270 prescriptions (29.25%) were containing...
corticosteroids as a treatment. Out of these 79 corticosteroid containing prescriptions only 10 prescriptions were without any single drug interactions. 69 total prescriptions out of 270 prescriptions i.e. (25.55%) were containing one or more corticosteroid related drug-drug interaction. It means 25% of the total drug interactions found was corticosteroid related. Out of 80 interacting drug combinations found, 17 interacting drug combinations (21.25%) were containing corticosteroids. 

Total prescriptions studied = 270

Prescriptions containing corticosteroids = 79 (29.25%)

Prescriptions with corticosteroid drug interactions = 69 (25.55%)

Total interacting combinations in 270 prescriptions = 80

Interacting combinations containing corticosteroids = 17 (21.25%)

**DISCUSSION**

This study indicates that corticosteroids are extensively being prescribed to indoor patients in DHQ hospital Gujrat. They have wide range of indications as well as side effect. Corticosteroids should be prescribed with great responsibility because they can result in sever drug interactions when used in combination with other drugs. Moreover, the patients on corticosteroids therapy should be monitored for drug response and drug interactions regularly.

Copyright© 24 May, 2013.
<table>
<thead>
<tr>
<th>DRUG COMBINATION</th>
<th>TYPE/MECHANISM OF INTERACTION</th>
<th>POTENTIAL ADVERSE EFFECTS</th>
<th>RECOMMENDATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocortisone (Corticosteroids) Metronidazole</td>
<td>Pharmacokinetic (increased metabolism)</td>
<td>Decreased metronidazole effect</td>
<td>Monitor Metronidazole concentration</td>
</tr>
<tr>
<td>Dexamethasone (Corticosteroids) Valium (Benzodiazepines)</td>
<td>Pharmacokinetic (probably increased metabolism; CYP3A4)</td>
<td>Possible decreased midazolam effect</td>
<td>Theoretically oral midazolam would interact to greater degree</td>
</tr>
<tr>
<td>Dexamethasone (Corticosteroids) Omeprazole</td>
<td>(mechanism not established)</td>
<td>Decreased prednisone effect</td>
<td>Monitor clinical status</td>
</tr>
<tr>
<td>Dexamethasone (Corticosteroids) Salbutamol (Sympathomimetic bronchodilators)</td>
<td>Pharmacodynamic</td>
<td>Hypokalemia with prednisone and fenoterol or albuterol (probably additive)</td>
<td>monitor potassium concentration</td>
</tr>
<tr>
<td>Rifampicin (Rifaximic) Solu-Cortef (Corticosteroids)</td>
<td>Pharmacokinetic (increased metabolism)</td>
<td>Marked decrease in corticosteroid effect</td>
<td>Avoid concurrent use, if possible; if combination is used, substantial increase in corticosteroid dosage may be needed</td>
</tr>
<tr>
<td>Aminophyllin (Theophyllines) Dexamethasone (Corticosteroids)</td>
<td>(mechanism not established)</td>
<td>Theophylline toxicity</td>
<td>monitor theophylline concentration</td>
</tr>
<tr>
<td>Dexamethasone (Corticosteroids) Furosemide</td>
<td>Pharmacodynamic</td>
<td>Increased potassium loss (additive)</td>
<td>Monitor potassium concentration</td>
</tr>
<tr>
<td>Dexamethasone (Corticosteroids) Theophyllines</td>
<td>(mechanism not established)</td>
<td>Theophylline toxicity</td>
<td>monitor theophylline concentration</td>
</tr>
<tr>
<td>Solu-Cortef (Corticosteroids) Zantryl (Sympathomimetic amines)</td>
<td>(mechanism not established)</td>
<td>Decreased dexamethasone effect with ephedrine Possible cardiopulmonary toxicity with ritodrine</td>
<td>Use another bronchodilator Avoid concurrent use, if possible</td>
</tr>
<tr>
<td>Dexamethasone (Corticosteroids) Montelukast</td>
<td>(mechanism not established)</td>
<td>Possible increased risk of edema</td>
<td>monitor clinical status</td>
</tr>
<tr>
<td>Alprazolam (Benzodiazepines) Dexamethasone (Corticosteroids)</td>
<td>Pharmacokinetic (probably increased metabolism; CYP3A4)</td>
<td>Possible decreased midazolam effect</td>
<td>Theoretically oral midazolam would interact to greater degree</td>
</tr>
<tr>
<td>Dexamethasone (Corticosteroids) Hydrochlorothiazide (Thiazide diuretics)</td>
<td>Pharmacodynamic</td>
<td>Increased potassium loss (additive)</td>
<td>Monitor potassium concentration</td>
</tr>
<tr>
<td>Dexamethasone (Corticosteroids) Solu-Cortef (Corticosteroids)</td>
<td>Pharmacodynamic</td>
<td>Beware of additive effects</td>
<td>Close patient monitoring</td>
</tr>
<tr>
<td>Decadron (Corticosteroids) Solu-Cortef (Corticosteroids)</td>
<td>Pharmacodynamic</td>
<td>Beware of additive effects</td>
<td>Close patient monitoring</td>
</tr>
<tr>
<td>Solu-Cortef (Corticosteroids) Ventolin (Sympathomimetic bronchodilators)</td>
<td>Pharmacodynamic</td>
<td>Hypokalemia with prednisone and fenoterol or albuterol (probably additive)</td>
<td>monitor potassium concentration</td>
</tr>
<tr>
<td>Adrenalin (Sympathomimetic amines) Solu-Cortef (Corticosteroids)</td>
<td>(mechanism not established)</td>
<td>Decreased dexamethasone effect with ephedrine Possible cardiopulmonary toxicity with ritodrine</td>
<td>Use another bronchodilator Avoid concurrent use, if possible</td>
</tr>
<tr>
<td>Dopamine (Sympathomimetic amines) Solu-Cortef (Corticosteroids)</td>
<td>(mechanism not established)</td>
<td>Decreased dexamethasone effect with ephedrine Possible cardiopulmonary toxicity with ritodrine</td>
<td>Use another bronchodilator Avoid concurrent use, if possible</td>
</tr>
</tbody>
</table>

**SUMMARY OF DRUG-DRUG INTERACTIONS OF CORTICOSTERIODS**
REFERENCES


AUTHOR(S):

1. DR. SYED TALAT IQBAL
   Department of Forensic Medicine,
   Nawaz Sharif Medical College,
   University of Gujrat

2. DR. ZAINAB BATOOL
   Department of Pharmacology,
   Nawaz Sharif Medical College,
   University of Gujrat

Correspondence Address:
Dr. Syed Talat Iqbal
Department of Forensic Medicine,
Nawaz Sharif Medical College,
University of Gujrat
drtalatiqbal@uog.edu.pk

Article received on: 22/03/2012
Accepted for Publication: 25/06/2013
Received after proof reading: 14/09/2013
PREVIOUS RELATED STUDIES

Sarfraz Husain Syed, Muhammad Arif, Muhammad Sultan. CATARACT; CORTICOSTEROID INDUCED INTRAOCULAR PRESSURE ELEVATION AFTER EXTRACTION (Original) Prof Med Jour 17(3) 416-419 Jul, Aug, Sep 2010.