STUDY ON DRUG UTILIZATION PATTERN OF CHRONIC RENAL FAILURE PATIENTS IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Objective: Chronic Renal Failure is a worldwide public health problem with an increasing incidence and prevalence, poor outcomes and high cost of treatment due to co-morbidities and Polypharmacy. The aim of this study was to describe drug utilization pattern of patients with chronic renal failure in a tertiary care hospital.

Methods: The study was conducted between July - 2013 to December-2013. In total 150 patients were identified and 135 patients were recruited for further study. Study subject medical record and prescription was reviewed on their regular hospital visit. Those were missed the follow-up, their medical records and prescription were reviewed from the medical record department.

Results: In this study, male subjects (62.85 %) predominated; 37.05% of the patients were in the age group of 51 to 60 years. The mean age of subjects was 53.26 ±15.69 years. The average number of drugs prescribed per prescription was 5.26 ± 3.79.

Conclusion: The prevalence of Polypharmacy was high in patients with CRF. Diuretics, anti hypertensive and anti diabetic drugs were used more frequently in chronic renal failure patients. Moreover time to time studies are required to improve management strategy and quality of life of patients.

Keywords: Prescribing pattern, Chronic Renal Failure, Polypharmacy.

INTRODUCTION

Chronic Renal Failure (CRF) is a worldwide public health problem with an increasing incidence and prevalence, poor outcomes and high cost of treatment due to co-morbidities and Polypharmacy[1,2]. The increasing importance, of drug utilization studies as a valuable investigation resource in pharmacoepidemiology. It has been bridging it with other health related areas, such as pharmacovigilance and pharmacoconomics [3]. Drug utilization studies may use to evaluate the drug use at a population level, according to demographic, morbidity and other characteristics. These studies are useful to monitor the pattern of drugs from particular therapeutic categories where the problems can be anticipated [4, 5, 6]. As compared with pre marketing clinical trials, post marketing studies are helpful to improve the therapeutic strategy and to monitor the incidence of adverse drug reactions and Drug interactions [7]. The cost of treatment in CRF was increased due to co-morbidities and use of number of drugs for same condition. Inappropriate use of drugs may increase the change of adverse drug reactions and reduce the quality of life of patients. To describe these issues, the study was planned to assess drug utilization pattern of patients with Chronic Renal Failure in a tertiary care hospital.

MATERIALS AND METHODS

The study was carried out in the department of nephrology. PSG Hospital. The study was approved by Institutional Human Ethics Committee. After obtained informed consent, the adult male and female patients were recruited to the study. Children, pregnant, breast feeding women and patient on haemodialysis were excluded from the study. During the study period, patients were interviewed and their medical records were reviewed to assess the drug utilization pattern.

Study population

The study was conducted between July -2013 to December-2013. In total 150 patients were identified and 135 patients were recruited for further study. Study subject medical record and prescription were reviewed on their regular hospital visit to the nephrology department of PSG Hospitals, Coimbatore. Those were missed the follow-up, their medical records and prescription were reviewed from the medical record department.

Statistical analysis

Documented Data was analyzed by using Graphpad prism version 4.0. Results were expressed as Mean ± Standard Deviation (SD). Non parametric values were expressed as the percentage.

RESULTS

In total, 150 Chronic Renal Failure patients were identified during the study period of six months. Of this, 135 patients were included for the study as per the inclusion and exclusion criteria (n=135). The patient’s medical record and prescription were reviewed to describe the drug utilization pattern.

Demographics

Out of 135 patients studied, 72 were male and 63 were female (Table-1). As per the study result, the percentage of male patients (62.85%) was greater than the percentage of female patients (37.14%).

Table 1: Gender distribution

<table>
<thead>
<tr>
<th>Sex</th>
<th>No. of Patient</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>72</td>
<td>53.33</td>
</tr>
<tr>
<td>Female</td>
<td>63</td>
<td>46.66</td>
</tr>
</tbody>
</table>

More number, of patients with in the age group of 51 to 60 years (16, 45.71 %). (Table -2) the mean age was 53.26 ± 15.69. The male and female subjects with the age group of 51-60 years were the highest in number by 26 (36.11 %) and 24 (38.09 %) respectively.

Co-morbidity assessment

The most frequently encountered co-morbidities were related to cardio vascular system. The more number of patients had hypertension, diabetes and anaemia as co-morbidities.
In total 135 subjects (82.96 %) with hypertension and 98 patients with (7.259 %) diabetes were reported during the study period. (Table-3).

<table>
<thead>
<tr>
<th>Name of the Drugs</th>
<th>No. of patient</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta Blocker</td>
<td>28</td>
<td>20.74</td>
</tr>
<tr>
<td>Metaprolol</td>
<td>24</td>
<td>17.78</td>
</tr>
<tr>
<td>Calcium Channel Blocker</td>
<td>32</td>
<td>23.70</td>
</tr>
<tr>
<td>Amlodipine</td>
<td>15</td>
<td>11.11</td>
</tr>
<tr>
<td>Felodipine</td>
<td>7</td>
<td>5.19</td>
</tr>
<tr>
<td>Angiotensin - II Receptor Antagonists</td>
<td>32</td>
<td>23.70</td>
</tr>
<tr>
<td>Losartan</td>
<td>42</td>
<td>31.11</td>
</tr>
<tr>
<td>Telmisartan</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Age distribution

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-40 Yrs</td>
<td>8</td>
<td>4</td>
<td>12</td>
<td>8.89</td>
</tr>
<tr>
<td>41-50 yrs</td>
<td>14</td>
<td>13</td>
<td>27</td>
<td>20.01</td>
</tr>
<tr>
<td>51-60 Yrs</td>
<td>26</td>
<td>24</td>
<td>50</td>
<td>37.03</td>
</tr>
<tr>
<td>61-70 Yrs</td>
<td>17</td>
<td>20</td>
<td>37</td>
<td>27.41</td>
</tr>
<tr>
<td>&gt;70 Yrs</td>
<td>7</td>
<td>2</td>
<td>09</td>
<td>6.67</td>
</tr>
<tr>
<td>Mean Age</td>
<td>53.26 ±15.69*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Mean ± Standard Deviation, Yrs – Years

Table 2: Age distribution

<table>
<thead>
<tr>
<th>Co-morbidity</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>70</td>
<td>42</td>
<td>112</td>
<td>82.96</td>
</tr>
<tr>
<td>Diabetes</td>
<td>64</td>
<td>34</td>
<td>98</td>
<td>72.59</td>
</tr>
<tr>
<td>Anaemia</td>
<td>58</td>
<td>62</td>
<td>120</td>
<td>88.89</td>
</tr>
<tr>
<td>Dyslipidaemia</td>
<td>30</td>
<td>26</td>
<td>56</td>
<td>41.48</td>
</tr>
<tr>
<td>Ocular disease</td>
<td>11</td>
<td>13</td>
<td>25</td>
<td>18.51</td>
</tr>
<tr>
<td>Neurological Disease</td>
<td>18</td>
<td>21</td>
<td>39</td>
<td>28.89</td>
</tr>
<tr>
<td>ENT Disease</td>
<td>05</td>
<td>11</td>
<td>16</td>
<td>11.85</td>
</tr>
</tbody>
</table>

**DISCUSSION**

The CRF population is on the rise worldwide due to increased incidence of diabetes and cardiovascular diseases. In other hand, inappropriate use of drugs and poly pharmacy make these populations vulnerable to drug induced kidney diseases [14]. In India, limited data are available on drug utilization in CRF population.

In this study, male subjects (62.85 %) predominated; 37.05% of the patients were in the age group of 51 to 60 years. The mean age of subjects was 53.26 ±15.69 years. The majority of these subjects had family history of cardiovascular diseases. The morbidity pattern in these subjects was quite similar to what is commonly found CRF patients in India. The common morbidities included cardiovascular conditions like Systemic Hypertension, Diabetes mellitus and disorders of the neurological Diseases. In an earlier study the remarkable feature of psychiatric conditions were noted from western countries in the geriatric patients [8].

The negligible prevalence of mental health problem in our study could be due to improved awareness regarding CRF among patients and family members. The Average number of drugs prescribed per prescription is an essential index to measure the degree of polypharmacy [9]. Also, it provides scope for systemic review and educational intervention in prescribing practices [13]. In this study the mean number of drugs per prescription was 5.26 ± 3.79, which could be due to prevalence of co-morbidities. It demonstrated that the polypharmacy or over prescribing of drugs in CRF patients may lead to risk of adverse drug reaction and drug interaction. Other hospital based studies have reported higher value [10].

Anaemia and dyslipidaemia were fairly prevalent in the study population of CRF patients other than hypertension and diabetes mellitus. Patients with diabetes were mostly having associated dyslipidaemia. They were treated with Glumipride (45.93%) or in combination with metformin. Most of the CRF patients with hypertension were treated with metoprolol and amlodipine or both. In this study, the average number of drugs used in CRF patients for mo-morbidities were same like other studies reported [11, 12]. Ferrus fumarate (41.48%) and folic acid (44.48%) were used frequently to treat anaemia. In this study of polypharmacy prevalence rate was high, it could be due to inclusion of proton pump inhibitor pantaprazole (82.96%) and multi vitamin (49.63%) preparations.

**Table 3: Co-morbidity assessment**

<table>
<thead>
<tr>
<th>Co-morbidity</th>
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<th>Female</th>
<th>Total</th>
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<tr>
<td>ENT Disease</td>
<td>05</td>
<td>11</td>
<td>16</td>
<td>11.85</td>
</tr>
</tbody>
</table>

**Table 4: Polypharmacy Assessment**

<table>
<thead>
<tr>
<th>No. of Drugs Prescribed</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 5 Drugs</td>
<td>11</td>
<td>8</td>
<td>19</td>
<td>14.07</td>
</tr>
<tr>
<td>More than 5 Drugs</td>
<td>61</td>
<td>55</td>
<td>116</td>
<td>85.92</td>
</tr>
</tbody>
</table>

*Mean ± Standard

**Table 5: Drug utilization pattern in CRF patients**

<table>
<thead>
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</tr>
<tr>
<td>Losartan</td>
<td>42</td>
<td>31.11</td>
</tr>
</tbody>
</table>
Aspirin + Clopidogrel  
\(\alpha_1\)-Receptor Antagonist
- Prazosin: 8  
- Alfuzosin: 5

HMG-CoA Reductase Inhibitor
- Atorvastatin: 56

Anti Diabetics
- Metformin: 36  
- Glycylazide: 12  
- Glimipride: 62

Stereos
- Prednisolone: 16

Anaeemic Drug
- Folic acid: 60  
- Ferrus fumarate: 56

Vitamin and Mineral
- Calcium carbonate and vitamin D3: 22
- Mecobalamin + Alpha Lipoic Acid: 56

Diuretics
- Spironolactone+Hydroflumethazide: 72
- Furosemide: 26
- Torsemide: 37

Proton Pump Inhibitor
- Pantoprazole: 112

Others
- Sodium Bicarbonate: 126

Furosemide (19.26%) and spironolactone+Hydroflumethazide (53.33 %) were prescribed for diuretic therapy in CRF patients. Co-morbidity of anaemia was treated with folic acid (44.44%) and ferrus fumarate (41.48 %). Proton Pump Inhibitor (PPI) and Vitamin B-complex containing preparations were prescribed with the high prevalence of 82.96% and 49.63% respectively.

CONCLUSION
In the present study, the prevalence of Polypharmacy was high in patients with CRF. Diuretics, anti hypertensive and anti diabetic drugs were used more frequently in chronic renal failure patient because of the high prevalence of co-morbidities. The value of indiscriminate use of anticoagulants and vitamins is valuable addition to the effective medications for secondary prevention of high risk patients. Moreover time to time studies is required in drug utilization pattern to improve management strategy and quality of life of patients. However, targeted education of the prescribers and dissemination of treatment guideline could facilitate rational use of drugs and adherence to treatment guidelines.

CONFLICT OF INTERESTS
The authors have no funding sources or conflict of interests to report.

ACKNOWLEDGMENTS
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REFERENCES