DRUG Utilization Studies
To Guide Better
Hospital Pharmaceutical Policy

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1. Pharmacy Practice Scenario in India

2. Clinical Pharmacy – Teaching and Practice

3. Promoting Quality and Safe use of Medicines – Our Experience

4. DUE Studies – Some Examples
Pharmacy Practice Scenario in India

• Practice of Pharmacy at different levels of healthcare and at different settings
  • Hospital – Primary, Secondary, Tertiary Healthcare
  • Community

• Educational Background of Pharmacists
  – D Pharm, B Pharm, M Pharm, Ph.D. and Pharm D

• Pharmaceutical Sciences Vs. Pharmacy Practice
A New Beginning

- Indo–Australian initiative
- The first Masters in Pharmacy Practice program was started in 1995–96
- TWO Clinical Pharmacy Practice Sites were established in Southern India
Department of Clinical Pharmacy

Department Activities

- Academic Programs
- CPD Programs
- Pharmaceutical care services
- Research
Pharmaceutical Care Services . . .

- Drug Information service
- Poison Information service
- Ward round participation
- Treatment chart review
Pharmaceutical Care Services

- Adverse Drug reaction detection, reporting & monitoring
- Patient counseling
- Patient referral
- Development of Therapeutic Guidelines
Collaboration with other hospitals

- Vikram Hospital, Mysore
- Ashakirana Hospital, Mysore
- Swami Vivekananda Memorial Hospital, Saragur
- Basappa Memorial Hospital, Mysore
- Holdsworth Memorial Hospital, Mysore
- Krishna Rajendra Hospital, Mysore
Research . . .

- Comparative Therapeutic Efficacy Evaluation
- Pharmacovigilance
- Drug Related Problems
- Medication Errors
- Medication Adherence
- Outcomes Research
- Drug Use Evaluation Studies
Scope for Drug Use Evaluation Studies

- Availability of more than 100,000 drug formulations
- Many unproven / non-essential drugs
- Irrational combinations
- Lack of independent, unbiased drug information for doctors
- Misleading and unethical advertising by pharmaceutical companies
- Lack of awareness of the principles of rational drug use among doctors and pharmacists
Drug Utilization Evaluation of Third Generation Cephalosporins
Need for the study

Antibiotics are one of the most commonly prescribed drugs today

Third generation cephalosporins are widely used in hospital settings due to their ‘extended spectrum of activity’

The spiralling cost of these drugs & the chances of developing resistance due to their widespread use, warranted the need for utilization evaluation of this class of antibiotics
**METHODOLOGY**

**Phase I**
- Evaluation of prescribing pattern

**Phase II**
- Collection of microbiological data

**Phase III**
- Preparation of draft guidelines

**Phase IV**
- Implementation of the guidelines

**Phase V**
- Evaluation after implementation of guidelines
Criteria for evaluation

- Indications for use of third generation cephalosporin

- Criteria for appropriateness of dose and dosing interval

- Criteria to change from IV to oral antibiotics
## Results

<table>
<thead>
<tr>
<th></th>
<th>Pre implementation</th>
<th>Post implementation</th>
<th>% improvement</th>
</tr>
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<tbody>
<tr>
<td>Patients with valid indication</td>
<td>72</td>
<td>93</td>
<td>21</td>
</tr>
<tr>
<td>Appropriate dose</td>
<td>77</td>
<td>94</td>
<td>17</td>
</tr>
<tr>
<td>Appropriate duration of therapy</td>
<td>81</td>
<td>90</td>
<td>09</td>
</tr>
<tr>
<td>IV to Oral</td>
<td>81</td>
<td>96</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
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Drug Utilisation Evaluation of Parenteral Proton Pump Inhibitors (PPIs)
Need for the study

- High efficacy, safety & easy availability of PPIs causes their irrational use and unnecessary exposure.

- Parenteral PPIs are costly thereby increasing the economic burden on the patients.

- Rational and judicious use of PPIs leads to cost-effective therapy and better patient care.
Phase I:
Collection of patient data & assessment

Phase II:
Evaluation of prescribing pattern

Phase III:
Formulation of guidelines

Phase IV:
Implementation of guidelines

Phase V:
Evaluation after implementation of guidelines
Criteria for evaluation

**Indications for use of parenteral antisecretory agents**

- Unconscious patients with any type of GI ulcers
- Patients unable to tolerate oral drugs or having severe vomiting, and are indicated for gastric acid suppression
- Hypersecretory condition: Zollinger–Ellison syndrome
- Stress–related mucosal bleeding
- Peptic ulcer rebleeding
- Prevention of acid aspiration syndrome during induction of surgical anaesthesia
## Results

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<tbody>
<tr>
<td>Patients with valid indication</td>
<td>224 (36%)</td>
<td>278 (55.6%)</td>
<td>19.6</td>
</tr>
<tr>
<td>Appropriate Post Operative Prophylaxis</td>
<td>102 (35%)</td>
<td>80 (45%)</td>
<td>10</td>
</tr>
<tr>
<td>IV to Oral</td>
<td>367 (60%)</td>
<td>391 (88%)</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>611</td>
<td>500</td>
<td>--</td>
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</tbody>
</table>
Interventions adopted

Educational interventions

- Preparation & circulation of guidelines
- Distribution of bulletins or newsletters
- Preparation of protocols
- Reminders at the point of prescribing
- Group discussion
Drug Utilization Evaluation in the Elderly
Background

• Indian elderly – 12.8% of worldwide elderly (2007) – expected to reach 100 million by 2013

• Health care utilization is also expected to increase

• Only 3.4% of the total government expenditure in India is spent on health care
Polypharmacy is a serious concern to patients in India, especially the elderly.

Geriatrics is not widely practiced in India.

Previous studies lack systematic description.

No variables tested as predictors of polypharmacy in hospitalized elderly.
Aim

• Prescribing patterns

• Concordance of medication prescribing with approved indications

• Prescribing patterns in the most commonly treated disease conditions

• Prevalence & Predictors of high-level polypharmacy
Methods

- Prospective active surveillance
- Patients aged 60 to 95 years from Medicine wards
- Two tertiary care hospitals
- January 2008 and June 2009
- Review from admission through discharge
Methods

• Coding
  – ICD 10
  – WHO ATC

• Concordance with indications – AHFS 2007

• Polypharmacy (5–9 medications) and High-level Polypharmacy (≥10 medications)

• Bivariate analysis and multivariate logistic regression
Results

- 814 patients (60.6% men, Median Age 66 years)

- Most commonly prescribed therapeutic class of medications
  - Systemic Antibacterials (J01) (574 [70.5%])
  - Acid related disorders (A02) (563 [69.2%])
  - Antithrombotic (B01) (347 [42.6%])

- Most commonly prescribed medications
  - Pantoprazole (498 [61.2%])
  - Ceftriaxone (259 [31.8%])
  - Aspirin (257 [31.6%])
Results

• Concordance
  – 7/10 most commonly prescribed as Indicated
  – Off Label Use
    • Pantoprazole
    • Ceftriaxone
    • Atorvastatin

• Polypharmacy (366 [45.0%])

• High-level Polypharmacy (370 [45.5%])

• Predictors of HLPP
  – multiple (≥3) diagnoses
  – Angina pectoris
  – Length of stay ≥10 days
Implications

- Promotion of pantoprazole, ceftriaxone, and atorvastatin prescribing in concordance with their indications
- Interventions to reduce HLPP
- Further studies on consequences of HLPP
- Off-label use expenditure on health
Implications

• Patient education regarding oral hypoglycaemic–induced hypoglycaemia in the elderly population in primary and secondary healthcare centres

• Is polypharmacy justified? Rationality of HLPP?

• Don’t set limit for no. of medications but use right medications at the right dosages and for the shortest possible duration on a case–by–case basis
Conclusion

- DUE programmes and clinical practice guidelines make a positive contribution to health care

- Promoting Quality and Safe Use of Medicines
  - Formation of Pharmacy and Therapeutics Comt
  - Triggered the hospital administrators to plan for hospital formulary
ACKNOWLEDGEMENT

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