A study of medication related readmissions in patients discharged within one month from the Medical Admissions Unit.

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Introduction

• Increasing rates of emergency readmissions pose significant pressures to NHS trusts.
• Defined as admission within 28 days of leaving hospital.
• Previous studies have shown medications account for a significant percentage of hospital admissions which may be preventable, up to 4.3%.

• Howard et al. Which drugs cause preventable admissions to hospital? A systematic review. British Journal of Clinical Pharmacology; 2006; 63.2; 136-147.
Background

• A large study in 2004 looked at medications as a cause of hospital admissions.
• This identified high risk drugs or drug groups including:
  – NSAIDs
  – Diuretics
  – Warfarin
  – Anti-platelets

Howard et al. Which drugs cause preventable admissions to hospital? A systematic review. British Journal of Clinical Pharmacology; 2006; 63.2; 136-147.
Aims and objectives

• To determine if medications are contributing to patients emergency readmissions to hospital.
• To assess the percentage of readmissions that are medication related.
• To classify these events.
• To determine if the occurrence is avoidable or unavoidable.
Methods

• Patient population comprised of those discharged from MAU and readmitted to the trust within 28 days over a 4 month period.

• Retrospective study recording patients diagnosis, past medical history and medication changes using case notes and inpatient and discharge prescriptions.
Methods

• Medication related events divided into:
  1. adverse drug reactions (ADR)- using WHO-UMC causality tool
     Any noxious unintended or undesired effect due to:
  2. drug interactions
  3. improper drug selection- not optimal in treatment of confirmed diagnosis
  4. untreated indication
  5. sub therapeutic dosage
  6. supra therapeutic dosage- excessive dosage or duration
  7. non compliance – failure to receive a drug due to patient or physician non compliance
  8. drugs without indication
Methods

• Avoidability of ADR assessed as per Hallas et al:

  – Definitely avoidable
  The ADR was due to a drug treatment procedure inconsistent with present day knowledge of good medical practice

  – Possible avoidable
  The ADR could have been avoided by an effort exceeding the obligatory demands of present day knowledge of good medical practice

  – Unavoidable
  The ADR could not have been avoided by any reasonable means
Results

• 85 patients assessed
• 12 were not true readmissions - self discharges or planned readmissions
• Of 73 patients 14 (19%) were medication related
• 50% were avoidable
• 36% were possibly avoidable
• 14% were unavoidable
Results

Classification of medication related readmission

- Adverse drug reactions: 50%
- Untreated indication: 14%
- Non compliance: 14%
- Drug interaction: 7%
- Supratherapeutic dose: 7%
- Improper drug selection: 7%
<table>
<thead>
<tr>
<th>Medication group</th>
<th>Drug</th>
<th>Classification</th>
<th>Avoidable/unavoidable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticoagulants</td>
<td>Warfarin</td>
<td>drug interaction</td>
<td>Avoidable</td>
</tr>
<tr>
<td></td>
<td>Warfarin</td>
<td>adverse drug reaction</td>
<td>Possibly avoidable</td>
</tr>
<tr>
<td>Hypoglycaemics</td>
<td>Metformin</td>
<td>adverse drug reaction</td>
<td>unavoidable</td>
</tr>
<tr>
<td></td>
<td>gliclazide</td>
<td>adverse drug reaction</td>
<td>avoidable</td>
</tr>
<tr>
<td>Beta blocker</td>
<td>bisoprolol</td>
<td>adverse drug reaction</td>
<td>avoidable</td>
</tr>
<tr>
<td>Anti-epileptics</td>
<td>carbamazepine</td>
<td>Supratherapeutic dose</td>
<td>avoidable</td>
</tr>
<tr>
<td>Anti depressants</td>
<td>venlafaxine</td>
<td>adverse drug reaction</td>
<td>Possibly avoidable</td>
</tr>
<tr>
<td></td>
<td>imipramine</td>
<td>adverse drug reaction</td>
<td></td>
</tr>
</tbody>
</table>
## Results

<table>
<thead>
<tr>
<th>Medication group</th>
<th>drug</th>
<th>Classification</th>
<th>Avoidable/ unavoidable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diuretics</td>
<td>furosemide</td>
<td>Non-compliance</td>
<td>Possibly avoidable</td>
</tr>
<tr>
<td>Calcium channel blocker</td>
<td>diltiazem</td>
<td>Adverse drug reaction</td>
<td>Possibly avoidable</td>
</tr>
<tr>
<td>GCSF</td>
<td>lenagrastim</td>
<td>Adverse drug reaction</td>
<td>avoidable</td>
</tr>
<tr>
<td>Antibiotics</td>
<td>trimethoprim</td>
<td>Improper drug selection</td>
<td>avoidable</td>
</tr>
<tr>
<td>Corticosteroids</td>
<td>prednisolone</td>
<td>Untreated indication</td>
<td>Possibly avoidable</td>
</tr>
<tr>
<td>Painkillers</td>
<td>Paracetamol &amp; tramadol</td>
<td>Untreated indication</td>
<td>avoidable</td>
</tr>
<tr>
<td></td>
<td>Overdose of various medicines</td>
<td></td>
<td>unavoidable</td>
</tr>
</tbody>
</table>
Discussion

• 50% of medication related readmissions were ADRs in this study
  – Anticoagulants
  – Hypoglycaemics
  – Beta blockers
  – Anti-depressants
  – Calcium channel blocker
  – Lenagragstim

• All excluding lenagragstimm have been identified in other studies as high risk groups causing hospital admission
Discussion

• It may be possible to target patients on high risk medicines to help reduce risk of readmission.
• Education on high risk medication groups and ADRs to look out for.
• Ensure effective communication to primary care when medicines started or doses changed.
• Patient counselling on side effects of new medicines and how to correctly take.
Conclusions

• Medications accounted for 19% of readmissions in this study.
• Adverse drug reactions 50% of these.
• Many were predictable and possibly avoidable.
• Targeting certain medication classes could help to reduce readmissions rates due to medications.
References

• Howard et al. Which drugs cause preventable admissions to hospital? A systematic review. British Journal of Clinical Pharmacology; 2006; 63.2; 136-147.
• Samoy et al. “Drug-related Hospitalizations in a Tertiary Care Internal Medicine Service of a Canadian Hospital: A prospective study. Pharmacotherapy; 2006; 26(11); 1578-1586.