Using a Pharmaceutical Care Model to Assess Medication-Related Risks in Older Travellers

Associate Professor Ian Heslop BSc(Hons) MSc DrPH GradCertBT
Academic Head – Pharmacy
College of Medicine and Dentistry
James Cook University, Australia.

Introduction

Some well known facts:

• Travellers are often at greater risk of health problems when travelling—
• Travel Health often focusses on:
  • Prevention and risk management of acute, infective or vaccine-preventable conditions
• Whereas, epidemiological data suggests:
  • Mortality can be caused by CV disease or physical accidents
  • Morbidity can be associated with pre-existing, chronic disease
• Medications play a key role in the management of chronic conditions

Introduction

So, what are the medication-related risks of travel?

• Many of the medications used in the management of chronic diseases have:
  • Significant SE profiles, NTI, TDM requirements and/or
  • Can be affected by a range of co-morbidities (including common travel-related conditions)
• A number of important airport studies have reviewed the KAP of travellers re:
  • Prevention/management of acute travel-related conditions and
  • Medications carried by travellers to deal with these issues
• However, few studies appear to:
  • Evaluate the medications carried by travellers to manage their chronic diseases
  • Assess the potential of medication-related risks associated with travel

Introduction

What are the medication-related risks of travel?

• An example study examined impact of travel on chronic diseases management
• Performed a retrospective chart review of 110 VFR travellers
• 57% had at least 1 health problem and at least 1/3 of cases were associated with a pre-existing chronic diseases
• High rates of non-adherence to medications were noted in the group
• Recommended that HPs should place greater emphasis on the management of the traveller’s chronic diseases and the importance of medication adherence

Introduction

How can we assess medication-related risk?

• Pharmaceutical care models have been developed to:
  • Identify and triage patients in greatest need of clinical pharmacy intervention and
  • To plan the pharmaceutical care of the patient
  • Mainly for use in hospital-based clinical pharmacy services
• Terminology differs, however most involve:
  1. An initial systematic risk assessment of the patient for:
    • Potential Pharmaceutical Risks (PPRs) or Pharmaceutical Care Issues (PCIs)
    • Severity, number and acuity of the PPRs and PCIs indicates the overall pharmaceutical care needs of the patients and, in turn, the level of clinical input required
  2. Followed by the development and implementation of an individualised pharmaceutical care plan

Aims and Objectives

• To develop and pilot a systematic pharmaceutical care model that could be used to evaluate the medication profiles of international travellers
• To evaluate the range of PPRs and PCIs associated with the chronic medications used by a sample of international travellers leaving an Australian airport
• To perform a comparison of the medication-related travel risks of older travellers versus younger travellers
Methods

Study Design

• A cross-sectional survey using structured interviews supported with a data collection questionnaire
• Participants were:
  - International travellers leaving Cairns Int. Airport over a 2 month period
  - Selected by a systematic random sampling technique
  - 18 years or older and given informed verbal consent
• Exclusion criteria
  - Poor understanding and/or inability to reply in English
• Interview focussed on:
  - Demographics
  - Sources of pre-travel health advice
  - Brief vaccination history
  - KAP of travellers towards common travel-related health risks
  - Systematic medication history of each interviewee

Methods

Data Analysis

• Survey responses collated and then reviewed:
  - Demographic data
  - Descriptive statistical analysis
  - Medication profile
    - Systematic medication history taken from each traveller
    - Medications collated and categorised into two groups:
      - Medications for management of acute, travel-related conditions
      - Medications for pre-existing, chronic conditions
    - Medications then sub-categorised into therapeutic groups
  - Medication profile reviewed for PPRs and PCIs

Table 1: PPRs and PCIs Identified

<table>
<thead>
<tr>
<th>Age Travellers aged 61yrs or over</th>
<th>PCI 10 Untreated indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reg Meds Travellers taking regular medications</td>
<td>PCI 11 Patient education required</td>
</tr>
<tr>
<td>No Reg Meds Travellers not taking regular medicines</td>
<td>PCI 12a Medicines recently started (general)</td>
</tr>
<tr>
<td>Crit Meds Travellers medications with a critical dose or route</td>
<td>PCI 12a(M) Medicines recently started (antimalarials)</td>
</tr>
<tr>
<td>PPRs Impractical Storage conditions</td>
<td>PCI 12b Medicines with potential storage issues whilst overseas</td>
</tr>
<tr>
<td>PPRs Inappropriate dosage regimen</td>
<td>PCI 12c Carrying adequate supplies for journey</td>
</tr>
<tr>
<td>PPRs Inappropriate duration of therapy</td>
<td>PCI 12d Carrying excessive supplies for journey</td>
</tr>
<tr>
<td>PPRs Potential drug-disease interaction</td>
<td>PCI 12e Medicines which could be illegal at destination</td>
</tr>
<tr>
<td>PPRs Potential drug-drug interaction</td>
<td>PCI 12f Visiting a malarial area without adequate chemoprophylaxis</td>
</tr>
<tr>
<td>PPRs Potential adverse drug reactions</td>
<td>PCI 12g Visiting a malarial area without chemoprophylaxis - Port Moresby</td>
</tr>
<tr>
<td>PPRs Potential or actual compliance problems</td>
<td>PCI 12h Medicines which could increase risk of common travel health disorders</td>
</tr>
<tr>
<td>PPRs Discrepancy between prescribed dose and dose used</td>
<td>PCI 12i Drugs/Diseases on which common travel diseases would have a major impact</td>
</tr>
<tr>
<td>PPRs Duplication of therapy</td>
<td>PCI 13 Other PCIs</td>
</tr>
</tbody>
</table>

Methods

Data Analysis – Identification/Review for PPRs and PCIs

• Step 1 – Identification of a series of test PPRs and PCIs
  - Literature search, focus group brainstorm and pilot
  - 17 standard and 10 travel-related test PPRs and PCIs identified

• Step 2 – Development of a Pharmaceutical Care Model (systemic process) to identify potential PPRs and PCIs in each traveller’s medication history

• Step 3 – Review of each traveller’s medication profile

• Step 4 – Independent review by an accredited pharmacist to confirm

Traveller S9

- Age 61-70yrs
- Male
- Returning to UK via Singapore
- Current Meds
  - Warfarin
  - Flecainide 100mg od
  - Losartan 50mg od
  - Atenolol 50mg od
  - Alendronate once weekly
  - Calcium with Vit D tabs 1 od
  - Furosemide 40mg od
  - Ibuprofen 200mg qds prn (bought in Australian supermarket)

- Age – aged 61 yrs and over
- Reg Meds – 8 (plus ibuprofen)
- Crit Meds – 3 (Warfarin, Flecainide, Alendronate)
- PCI 1 (Inappropriate dosage regimen)
  - Flecainide normally bd regimen
- PCI 4 (Potential drug-drug interactions) x 4
  - Losartan + NSAID + Frusemide = increased risk of renal impairment
  - Warfarin + NSAID = increased risk of bleeding (not being monitored until reaches UK)
  - Alendronate + NSAID = increased risk of GI disorders
  - Flecainide + Beta blocker = risk of bradycardia plus AV block (rare)
- PCI 6 (monitoring required)
  - Warfarin/INR
- PCI 12i (Drugs/Diseases on which common travel diseases would have a major impact)
  - A common travel disorder such as severe TD could have a major impact on this traveller

- Total Number of Potential PCIs = 8

Fig 1: Flowchart Summary of the Pharmaceutical Care Model (Systematic Review Process) to Identify PPRs and PCIs in each Traveller’s Medication History

Fig 2: Example of Traveller assessment for PPRs and PCIs
A total of 218 travellers were interviewed. The sample was divided into two groups:
- "Younger" travellers - 18-60 yrs
  - n=174 (79.8% of sample)
- "Older" travellers - 61 yrs or older
  - n = 44 (20.2% of sample)

Males were more prevalent in both groups:
- Younger group – 70.7% male (123/174)
- Older group – 54.5% male (24/44)

Australian travellers were more prevalent in the Younger group - 63.8% (111/174)
Non-Australian travellers were more prevalent in the Older group – 59.1% (26/44)

## Results and Discussion

### Demographics

<table>
<thead>
<tr>
<th></th>
<th>Younger Travellers</th>
<th>Older Travellers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of travellers not taking chronic meds</td>
<td>102 (58.6%)</td>
<td>12 (27.3%)</td>
</tr>
<tr>
<td>Number of travellers taking chronic meds</td>
<td>72 (41.6%)</td>
<td>32 (72.7%)</td>
</tr>
<tr>
<td>Ave. Number of Chronic Meds/Traveller</td>
<td>2.04</td>
<td>2.88</td>
</tr>
<tr>
<td>% of Travellers with PCI 6 – Medications requiring TDM</td>
<td>4.9% (5/102)</td>
<td>12.5% (4/32)</td>
</tr>
</tbody>
</table>

Older travellers do take a greater number of medications and are more likely to take chronic, critical or meds requiring TDM.

### Medication Profile

Older travellers do take a greater number of medications and are more likely to take chronic, critical or meds requiring TDM. However:

- Low No. critical meds in both groups - mainly insulin, anticonvulsants or anticoagulants
- Use of meds is low relative to other populations – Overall, 52.3% (114/218) not taking chronic meds and only 7.3% (16/218) were taking 4 or more.

### PPRs and PCIs

Older travellers are more likely to have PCIs and are less likely to have Zero PCIs than younger travellers. However,

- Many travellers do not have PCIs. Even in older group, the average no. of PCIs is low relative to other populations.
- However, some travellers had up to 9 PCIs and many were significant – Need a system to identify these travellers.

### Results and Discussion

PPRs and PCIs more prevalent in the younger group

Mainly strong history of allergies to drugs (eg. Mac) that potentially could be used to treat travel-related conditions

PPRs and PCIs more prevalent in the older group

Older travellers greater risk of drug-disease or drug-drug interactions although varied in clinical significance. However, although the incidence of PCIs 3, 4, and 6 are low in sample, they could be clinically significant for the individual traveller.

PPRs and PCIs more prevalent in the older group

Older travellers greater risk of drug-disease or drug-drug interactions although varied in clinical significance. However, although the incidence of PCIs 3, 4, and 6 are low in sample, they could be clinically significant for the individual traveller.

PPRs and PCIs more prevalent in the older group

Older travellers greater risk of drug-disease or drug-drug interactions although varied in clinical significance. However, although the incidence of PCIs 3, 4, and 6 are low in sample, they could be clinically significant for the individual traveller.
Conclusions

It has to be remembered that:

- Many travellers do not take chronic medications and do not have PCIs.

However, for those that do:

- PCIs were identified that have the potential to complicate the care of that traveller and
- Older travellers take more medications and can have more significant PPRs and PCIs than younger travellers.

Key PCIs identified include:

- Inadequate antimalarial precautions taken by many travellers to endemic areas.
- The need to educate travellers about their medications.

Study also demonstrated:

- The need for greater emphasis to be placed on the medication-related risks of travellers.
- The need for a system of identify and evaluate the medication-related risk of at-risk travellers.
- There is an important role for Pharmacists in the travel health team.

Limitations

- Small study in one regional international airport servicing a low number of international destinations.
- Low number of participants.
- Location of study restricted what questions could be asked.
- Researcher was only able to interview travellers who could speak English. In particular the researcher was unable to speak Japanese, Cantonese or Mandarin.

References

1. Leggat PA. Risk assessment in travel medicine. Travel Med Infect Dis. 2006;4:127-34.

Acknowledgements

Prof Beverley Glass
Emeritus Prof Rick Spears
Asoc Prof Michelle Bellinger
Mr John Smithson
Ms Sue Cooper, Cairns Ports Ltd
Cairns International Airport
DTHM, James Cook University

Questions?