Furnishing Medications for the Older Traveler: Drug – Disease Interactions

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Learning Objectives

• Review US travel statistics and opportunity for pharmacy-based travel health services
• Review changes that may occur in advanced age and how they may impact medication usage
• Review common drug disease interaction pathways that pharmacists should consider when furnishing travel-related medications

International Travel Is Increasing

International Travel is increasing from 2012 to 2017.

- Approximately 38% of US travelers sought travel health advice prior to departure
- 22% did not perceive a need
- 20% did not perceive a risk of illness
- 10% were too busy
- 22 to 64% of US travelers will report some health problem while overseas
  - Gastrointestinal (e.g. N/V/D)
  - Dermatological (e.g. CLM)
  - Respiratory (e.g. cough, asthma exacerbations)
- Per NTTO, only 12% saw a healthcare provider in 2017

Travel Health is an Opportunity for Pharmacy!

70 million customers served/week in 65 countries
~275 million visits to a pharmacy/week

Impact of an Aging Population

• US cost for drug related morbidity and mortality is estimated at 400 billion
• By 2050, 30% of the population in developed countries will be over 65 years of age
  • Older patients “consume” 30% of all health care resources
  • Have multiple chronic medical conditions
  • Polypharmacy issues
  • Increased risk of ADRs due to pharmacokinetic and pharmacodynamic changes with the aging process
• 5-10% of US international travelers are over 65 years of age

Global TravEpiNet Consortium. Open Forum Infectious Diseases DOI: 10.1093/ofid/ofy266
Lee TK. Tropical Diseases, Travel Medicine, and Vaccines 2017; 3: 10-22
Beers List (U.S.)

- List of potentially inappropriate medications (↑ ADE risk)
- Older patients may be taking routine medications on List
- Concern for injury, falls, other ADE’s, accessing appropriate services (during travel)
- Opportunity for pharmacist intervention, expanded travel service
- Most travel-related medications are not included on the Beers List
- Travel-related medications on List
  - 1st generation antihistamines
  - Scopolamine

Prevalence of Drug-Disease Interactions Varies

American Geriatrics Society. 2015; 63(11): 2227-46

Geriatric Drug Syndromes (GDS)
- Defined by study researchers as
  - Cognitive impairment
  - Frailty
  - Falls
  - Immobility
  - Incontinence
- Older adults with GDS may use more medications (Beers medications?), leading to ↑GDS risk
- GDS may ↑ risk of injury during travel

Travel Risks Due to Advanced Age
- Functional decline in homeostasis may result in
  - Increased risk of altitude illness
  - Increased risk for heat injury
  - Increased risk for dehydration
  - Increased risk for jet lag
- Efficaciousness of vaccines may decline due to immunosenesence

Lee TK. Tropical Diseases, Travel Medicine, and Vaccines 2017; 3: 10-22

Cardiovascular Diseases
- Mefloquine:
  - Contraindicated in cardiac conduction abnormalities
  - Sinus bradycardia, sinus arrhythmia, first degree AV block, QTc prolongation, abnormal T waves have been reported
  - Contraindicated with concurrent use of ketoconazole or halofantrine
  - Fatal QTc prolongation may occur
- Azithromycin
  - Use with caution in those with QTc prolongation, arrhythmias, bradycardia
  - Fatal arrhythmias may occur
  - Associated with sudden cardiovascular death (z-pack dosing regimen)

Lee TK. Tropical Diseases, Travel Medicine, and Vaccines 2017; 3: 10-22

Lee TK. Tropical Diseases, Travel Medicine, and Vaccines 2017; 3: 10-22

Lee TK. Tropical Diseases, Travel Medicine, and Vaccines 2017; 3: 10-22
Azithromycin is Associated with a Small, but Increased Risk of Death

<table>
<thead>
<tr>
<th></th>
<th>No Antibiotic</th>
<th>Amoxicillin</th>
<th>Azithromycin</th>
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<tbody>
<tr>
<td>Total cardiovascular</td>
<td></td>
<td></td>
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<tr>
<td>Deaths</td>
<td>41</td>
<td>42</td>
<td>29</td>
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<tr>
<td>Cumulative incidence (per 1 million courses)</td>
<td>29.8</td>
<td>51.5</td>
<td>81.2</td>
</tr>
<tr>
<td>Hazard ratio (95% CI)</td>
<td>1.00 (0.21-4.69)</td>
<td>2.04 (1.79-4.88)</td>
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<tr>
<td>P-value</td>
<td>0.85</td>
<td>&lt;0.001</td>
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Central Nervous System/Psychiatric Medical Issues

- Mefloquine has long been associated with CNS-related ADR’s
- Frequent at prophylactic doses: insomnia*, vivid dreams*, visual disturbances, depression*, anxiety*
- Common with higher treatment doses: psychosis, seizures
- Post market surveillance: paresthesia, agitation, mood changes, panic attacks, confusion, hallucinations
- Contraindicated in a host of psychiatric conditions, concerns of suicide/death
- Start mefloquine ≥ 2 weeks before departure, discontinue if ADRs occur

Immunosuppression

- HIV, malignancies, immune suppressive medications, etc
- ACIP vs. IDSA guidelines on immunosuppression (low vs high immune suppression)
- Concern with ↑ disease acquisition and disease presentation
- Exacerbation of underlying illness with infection
- General recommendations for the immune suppressed traveler include:
  - Same recommendations as immunocompetent travelers (malaria, TD, etc)
  - Consider drug-drug interactions (e.g. protease inhibitors) when furnishing
  - Strict adherence to insect and food/water precautions

Summary and Conclusions

- Outbound international travel from the US continues to increase
- Risk of travel-related diseases exist, travelers may not seek care
  - Need for medications and vaccines to protect from illnesses
- Older travelers may have altered pharmacokinetic and pharmacodynamic profiles
  - Choice of medication
  - Dose adjustments
- Important to preform a risk assessment prior to travel, provide medications and vaccines, and patient counseling information