“I went on holiday and came back with....”

Tom Doherty

Hospital for Tropical Diseases
HTD: CASUALTIES.....

I kinda feel I may have picked something up in India, man...
Visits made by UK residents abroad

World travel from the UK

- MALARIOUS REGIONS
- TOTAL WORLD

<table>
<thead>
<tr>
<th>Year</th>
<th>Total World</th>
<th>Malarious Regions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>.2 m</td>
<td>.2 m</td>
</tr>
<tr>
<td>1985</td>
<td>1.2 m</td>
<td>1.2 m</td>
</tr>
<tr>
<td>1990</td>
<td>2.2 m</td>
<td>2.2 m</td>
</tr>
<tr>
<td>1995</td>
<td>3.2 m</td>
<td>3.2 m</td>
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<tr>
<td>2000</td>
<td>4.2 m</td>
<td>4.2 m</td>
</tr>
<tr>
<td>2005</td>
<td>5.2 m</td>
<td>5.2 m</td>
</tr>
<tr>
<td>2010</td>
<td>6.2 m</td>
<td>6.2 m</td>
</tr>
</tbody>
</table>

World visits
Patients admitted to HTD with a fever:
QJM, 1995, 88: 277 - 281

Prospective analysis of 195 patients admitted consecutively from November 1992 – April 1993

Returned from a “tropical” country within last six months

Temperature on admission > 37.0°C

Observational study

Diagnoses made by attending physicians
Patients admitted to HTD with a fever:
QJM, 1995, 88: 277 - 281

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria</td>
<td>82</td>
</tr>
<tr>
<td>Presumed Viral Illness</td>
<td>48</td>
</tr>
<tr>
<td>Dengue</td>
<td>12</td>
</tr>
<tr>
<td>Dysentery</td>
<td>10</td>
</tr>
<tr>
<td>Lower respiratory tract</td>
<td>8</td>
</tr>
<tr>
<td>Hepatitis</td>
<td>6</td>
</tr>
<tr>
<td>Urinary tract infection</td>
<td>4</td>
</tr>
<tr>
<td>Tonsillitis</td>
<td>4</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>3</td>
</tr>
<tr>
<td>Typhoid</td>
<td>3</td>
</tr>
<tr>
<td>Sinusitis</td>
<td>2</td>
</tr>
</tbody>
</table>

One each:
- Cellulitis
- Cryptococcal meningitis
- EBV
- Herpes zoster
- Infected eczema
- Pyelonephritis
- Salmonella enteritidis
- Sickle cell crisis
- Stevens-Johnson Syndrome
- Toxoplasmosis
- Typhus
Imported Fevers: Useful Diagnostic Tests

- Malaria films
- Full blood count
- Liver function tests
- Cultures - blood, urine, stool, CSF, throat swab
- Imaging: chest X-ray, abdominal ultrasound
- Serology: as indicated, serial samples, stored - less helpful in the acute phase
### Acute fever (< 2 weeks)

<table>
<thead>
<tr>
<th>Neutrophils normal/low</th>
<th>Neutrophils high</th>
</tr>
</thead>
<tbody>
<tr>
<td>Localising features</td>
<td>No localising features</td>
</tr>
</tbody>
</table>

- **Malaria**
- **Viral illness**
- **Enteric fever**
- **Rickettsia**
- **ALA**
- **Tonsillitis**
- **Pneumonia**
- **Septicaemia**
- **Leptospirosis**
- **Borreliosis**
### Chronic fever (> 2 weeks)

<table>
<thead>
<tr>
<th>Neutrophils low</th>
<th>Neutrophils normal</th>
<th>Neutrophils high</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria</td>
<td>Malaria</td>
<td>Deep sepsis</td>
</tr>
<tr>
<td>VL</td>
<td>TB</td>
<td>Cholangitis</td>
</tr>
<tr>
<td>HIV</td>
<td>Endocarditis</td>
<td>ALA</td>
</tr>
<tr>
<td>TB</td>
<td>Brucellosis</td>
<td>Borreliosis</td>
</tr>
<tr>
<td>Brucellosis</td>
<td>Toxoplasmosis</td>
<td>Trypanosomiasis</td>
</tr>
</tbody>
</table>
Fever and eosinophilia

Acute schistosomiasis – Katayama fever

Invasive *Fasciola hepatica*

Lymphangitis due to *Wuchereria/Brugia*

*Strongyloides stercoralis*

Atopy and drug reactions
Fever and HIV

All of the above..

But also:

- Sero-conversion illness
- Cryptococcal disease
- Non-typhoidal *Salmonella*
- *Penicillium marneffii*
- Lymphoma
Case Histories

Fever as the main sign and symptom
Professor Parry’s maxim:

Why does this person from this place develop these symptoms at this time?
35 year old Bangladeshi man:

Arrived from Bangladesh 10 days previously
Unwell one week before leaving, then improved
Recurrence of symptoms four days ago
Complained of:
   Fever, rigors, stiff neck, vomiting
   Headache, night sweats
No other localising symptoms
Clinically:
Febrile 39.5°C, pulse 125, BP 125/60
Chest clear
Abdomen soft - no organomegaly

Investigations:
Hb 15.3 g/dl
WCC 5.3 x 10^9/L
CRP 74 mg/L
Malaria films –ve x 3
Blood and urine culture
Cases of travel-associated *S.typhi* & *S.paratyphi* reported in the UK

- Total Travel-assoc. *S.typhi* infections imported to UK
- Total Travel associated *S.paratyphi* infections imported to the UK

82% of cases from the Indian sub-continent

30% *S. paratyphi* & 23% *S. typhi* imported into the UK have decreased susceptibility to ciprofloxacin
“Arthur”:

22 year old Caucasian man, recently graduated
6 months back-packing holiday, mostly camping
(No stars → 1 star (with a maximum of 5 stars))
RSA / Botswana / Zimbabwe / Malawi / Kenya
Prophylaxis: Chloroquine & proguanil
Compliance ~ 90%
Scuba diving course in Malawi
Swam in Lake Kariba
No sexual contacts
Presented four weeks after return

Complaining of:

- Swollen eyelids 2-3 days, now resolved
- 3 days: Urticarial rash over arms and body
- Malaise with fever

Clinically:

- Febrile 37.8°C
- Urticarial rash
- No organomegaly
Investigations:

Malaria parasite screen (MPS) – negative

Hb: 14.5 gm/dl
WCC (white cell count): 11.5 x 10^9/L
Eosinophils: 1.2 x 10^9/L
(normal < 0.4 x 10^9/L)
Eosinophilia:

Think in absolute numbers, not in %..

Eosinophilia *defined* as $> 0.4 \times 10^9/L$..

*Commonly* associated with parasitic infection..

*Tends* to be associated with migration.
Lake + Malawi = Schistosomiasis
Katayama Fever - Acute Schistosomiasis

Rx

Praziquantel 20mg/kg for two doses
Prednisolone 20mg daily for 5 days

Uneventful recovery
Followed up at 3-4 months with two further doses of Praziquantel
Repeat Schistosomal serology - positive
<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>None</td>
</tr>
<tr>
<td>Cough</td>
<td>Hepatomegaly</td>
</tr>
<tr>
<td>Rash</td>
<td>Splenomegaly</td>
</tr>
<tr>
<td>All three</td>
<td>Wheeze</td>
</tr>
<tr>
<td></td>
<td>Urinary</td>
</tr>
</tbody>
</table>

- Fever: 72%
- Cough: 63%
- Rash: 35%
- All three: 13%
"Arthur #2":

Thailand for 1 month
  Returned nine days ago
  Sore throat, fever, aches and pains,
    vomiting, rigors and delirium over past two days
  Headache and macular rash, epistaxis
No malaria prophylaxis
O/E

Conscious, unwell
Febrile 38°C, BP 96/47

Investigations:

Hb 15.2 g/dl
WCC 2.4 x 10^9/L
Platelets 56 x 10^9/L
Skin Rash
Viral Serology:
Dengue IgG & IgM positive
Signs and symptoms in 250 Europeans and immigrants with dengue fever

Jelinek et al. CID 2002; 35:1047-1052:
Regions of acquisition of dengue fever among European travellers (% of total)

Jelinek et. al. CID 2002; 35:1047-1052:
47 year old man visiting West Africa

Spent eight days offshore on an oil rig with one night on shore
Nine days after return: cough and general malaise
  visited GP
    Temp 37.5°C, Δ URTI Rx antibiotics
Four days later:
  GP called out for second time
  History of travel to malaria endemic region with no prophylaxis
    Jaundiced, 38°C, confused and tachycardia
Admitted to hospital
47 year old man visiting West Africa

O/E

Moribund
Jaundiced, anuric, febrile
Blood film 40%

*P. falciparum*

Rx I/V Quinine
Died 8 hours after admission
Days from first symptom to diagnosis

Days from first symptom to diagnosis

Proportion of fatal cases N=71

Proportion of non-fatal cases N=1425
Region of *P. falciparum* malaria infection in travellers from Europe % total

Imported Falciparum Malaria in Europe; Jelinek et. al. CID 2002; 34;572-6
Conclusions

A travel history is essential for anyone presenting with a fever.
Up to half of febrile illnesses may not have a clear diagnosis - and will settle spontaneously.
Malaria is relatively common and requires early diagnosis and rapid treatment.
Non “tropical” causes should always be considered in the differential diagnosis.
Migrants are at particularly high risk of infection.
Any questions?
Thanks for listening

tom.doherty@uclh.nhs.uk