Infectious Diseases in British Troops

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Gastroenteritis
Mystery Illness in Afghanistan 2002

MYSTERY ILLNESS

18 affected
2 seriously ill

TROOPS IN AFGHANISTAN
**WIA : DNBI Figures for Operations Telic & Herrick**

British troops admitted to UK Role 3 facilities (field hospitals) :

<table>
<thead>
<tr>
<th>Year</th>
<th>Iraq</th>
<th>Afghanistan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WIA</td>
<td>DNBI</td>
</tr>
<tr>
<td>2006</td>
<td>93 (7%)</td>
<td>1209 (93%)</td>
</tr>
<tr>
<td>2007</td>
<td>202 (16%)</td>
<td>1098 (84%)</td>
</tr>
<tr>
<td>2008</td>
<td>20 (3%)</td>
<td>758 (97%)</td>
</tr>
<tr>
<td>2009</td>
<td>0 (0%)</td>
<td>218 (100%)</td>
</tr>
<tr>
<td>2010</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>2011</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>2012</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Total</td>
<td>315 (9%)</td>
<td>3283 (91%)</td>
</tr>
</tbody>
</table>

From “Operational Casualty & Fatality Tables” (www.mod.uk)
DNBI Figures for Operations in Iraq & Afghanistan

US military survey of DNBI in >15 000 returning troops:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diarrhoeal illness</td>
<td>77% (Iraq) or 54% (Afghanistan)</td>
</tr>
<tr>
<td>Respiratory illness</td>
<td>69% (Iraq &amp; Afghanistan)</td>
</tr>
<tr>
<td>Non-battle injury</td>
<td>35% (Iraq &amp; Afghanistan)</td>
</tr>
</tbody>
</table>


UK OpEDAR records for >26 000 attendances:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diarrhoeal illness</td>
<td>20% of all attendances (Iraq)</td>
</tr>
<tr>
<td>Respiratory illness</td>
<td>1% of all attendances (Iraq)</td>
</tr>
<tr>
<td>Non-battle injury</td>
<td>Not recorded</td>
</tr>
</tbody>
</table>

UK-US Role 3 Medical Admissions in Helmand over 7 wks

- Gastrointestinal: 44%
- ID & Trop Med: 20%
- Respiratory: 8%
- Dermatology: 7%
- Neurology: 7%
- General: 7%
- Cardiology: 6%
- Haematology: 5%
- Psychiatry: 1%
- Endocrinology: 1%
- Other: 9%
UK-US Role 3 Medical Admissions in Helmand over 7 wks

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Cases</th>
<th>Infections</th>
<th>Evacuations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gastrointestinal</td>
<td>97</td>
<td>85</td>
<td>3</td>
</tr>
<tr>
<td>ID &amp; Trop Med</td>
<td>44</td>
<td>40</td>
<td>2</td>
</tr>
<tr>
<td>Respiratory</td>
<td>17</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td>Skin &amp; soft tissue</td>
<td>16</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Neurology</td>
<td>15</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>General</td>
<td>14</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Cardiology</td>
<td>11</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Haematology</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Psychiatry</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Endocrinology</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total: 221 cases, 157 (71%) infections, 18 (8%) evacuations, 0 deaths
UK Role 4 Military Infectious Disease Cases

Cases seen at BHH from 2005-9 = 131

Evacuated from overseas = 86 (66%)
Referred from UK = 45 (34%)

<table>
<thead>
<tr>
<th>Diagnostic Group</th>
<th>Number of Cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dermatological</td>
<td>59 (45%)</td>
</tr>
<tr>
<td>Undifferentiated febrile illness</td>
<td>38 (29%)</td>
</tr>
<tr>
<td>Respiratory</td>
<td>15 (11%)</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>9 (7%)</td>
</tr>
<tr>
<td>Non-specific illness</td>
<td>7 (5%)</td>
</tr>
<tr>
<td>Rheumatological</td>
<td>2 (2%)</td>
</tr>
<tr>
<td>Neurological</td>
<td>1 (1%)</td>
</tr>
</tbody>
</table>
What are the endemic infectious diseases of Afghanistan?

In 2001 the main threats to foreign troops were thought to be:

Malaria … leishmaniasis … enteric fever … viral hepatitis … gastroenteritis … dysentery … cholera … intestinal helminths … … pneumococcal pneumonia … pertussis … other atypical pneumonias … tuberculosis … influenza … leptospirosis … relapsing fever … Q fever … louse-borne (epidemic) typhus … flea-borne (endemic) typhus … tick (spotted fever) typhus … Crimean-Congo haemorrhagic fever … West Nile fever … sandfly fever … tick-borne encephalitis … hantavirus … echinococcosis … anthrax … plague … etc.

Infectious Diseases on Operation Herrick (Afghanistan)

Gastrointestinal:
- Viral gastroenteritis
- Bacterial gastroenteritis
- Intestinal helminth infections

Respiratory:
- Pneumococcal pneumonia
- Atypical LRTIs (e.g. pertussis, mycoplasma, influenza)
- Tuberculosis

Febrile illnesses:
- Malaria
- Arboviruses (sandfly fever, CCHF etc.)
- Rickettsiae (typhus, Q fever etc.)

Skin & soft tissue:
- Trauma-related infections
- *Staphylococcus aureus* (including PVL strains)
- Cutaneous leishmaniasis
Helmand Fever

Since 2006 undifferentiated febrile illnesses have occurred amongst British troops based in and returning from Helmand, Afghanistan. All had negative blood cultures, malaria tests & chest radiographs. Patients were initially thought to have malaria, dengue, infectious mononucleosis or viral hepatitis, but diagnoses were not confirmed. Therefore a fever study was performed to investigate cases of:

“Any acute undifferentiated febrile illness occurring amongst British troops in Helmand, Afghanistan that had no organ focus on clinical and radiological assessment and no positive results from microbiological investigations including blood cultures and malaria antigen tests”

“Helmand Fever Study” → “Helmand Fever” as a working diagnosis
Helmand Fever Study

Performed from May – October 2008

26 cases of acute UFI seen at military hospital at Camp Bastion, of whom 13/26 (50%) were medically-evacuated to BHH

- Sandfly fever = 12/26 (43%)
- Acute Q fever = 6/26 (26%)
- Rickettsial infections = 5/26 (22%)
- Crimean-Congo haemorrhagic fever = 0/26 (0%)

Clinical features & field hospital investigations could not distinguish between these different diagnoses

So empirical Rx with doxycycline given to all subsequent cases

Acute Q Fever

*Coxiella burnetti* is an intracellular bacterium similar to rickettsia & is usually transmitted by infected animals products, aerosols or ticks. ~50% of infections are asymptomatic and remainder present with:

- (usually) undifferentiated fever, respiratory infection or hepatitis
- (rarely) maculopapular rash, myocarditis or CNS infection

Laboratory diagnosis requires serology or PCR tests and easily-deployable “point-of-care” tests are not available for military use.

Treatment with doxycycline 200 mg daily for 2 weeks reduces morbidity, but does not prevent chronic Q fever endocarditis.

Hence we do baseline echocardiography & follow-up for ~2 years with serology (until Phase 1 IgG becomes <1:1024).
Mean Serology Titres in 50 Acute Q Fever Cases
Further Issues regarding Q Fever

Chronic Q fever endocarditis occurs in 1-5%
Q fever fatigue syndrome occurs in up to 25%

24% of military cases feel that their fitness is affected at 1 year
16% of military cases unable to pass military fitness tests at 1 year

Serology titres can be difficult to interpret
PCR test has relatively low sensitivity
IGRA tests are being developed
PET scanning may have a role

The definition of chronic Q fever is currently under review
Dutch outbreak of >4,000 cases is improving current knowledge
Helmand Fever Update

Guidance issued on diagnosis, empirical treatment & prevention (Reference 2012DIN06-019 available on DII system)

Additional “internal” guidelines on management of Q fever with baseline echocardiography & follow-up for ~2 years with serology.

Doxycycline prophylaxis and Q fever vaccine are not considered appropriate by military public health authorities.

Sero-surveillance of troops before & after 6-month deployments:

• 2.3% seroconversion to sandfly fever (~460 cases / year)
• 1.3% seroconversion to rickettsial infections (~260 cases / year)
• 1.0% seroconversion to Q fever (~200 cases / year)

Sandfly fever cases in focal areas, but Q fever cases widespread

Staphylococcus aureus
Alert after rare bug kills marine

Doctors are being issued with urgent advice about an extremely rare form of superbug following the death of a young Royal Marine.

Richard Campbell-Smith, 18, cut a leg in training and died after reportedly becoming infected with the toxin Panton Valentine Leukocidin.

At his inquest in Exeter a medical expert revealed the disease was thought to have died out in the 1950s.

The Royal Marines say they have no plans to change their training.
Cutaneous Leishmaniasis

Cutaneous Leishmaniasis due to *L. braziliensis* & *L. mexicana* from Belize
Leishmaniasis and British Military Deployments

Distribution of Leishmaniasis from BMJ 2003;15:377-82
CL Diagnosis

Preferred Site for Punch Biopsy of Suspected Lesions
CL Diagnosis

Microscopy of a Touch Preparation showing Amastigotes (2-4 μm in diameter)
CL Diagnosis

Histology of a Skin Biopsy showing Leishmania Amastigotes
Microscopy of a Culture showing a Promastigote (10-20 μm in length)
# UK Treatment Guideline

<table>
<thead>
<tr>
<th>Treatment</th>
<th>“Simple” Lesion</th>
<th>“Complex” Lesion</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>L. major</em></td>
<td>IL SSG weekly x 1-4 or a physical treatment</td>
<td>IV SSG 20 mg/kg x 10-20 days</td>
</tr>
<tr>
<td><em>L. tropica</em></td>
<td>IL SSG weekly x 1-4 or a physical treatment</td>
<td>IV SSG 20 mg/kg x 10-20 days</td>
</tr>
<tr>
<td>unidentified / other OWCL species</td>
<td>IL SSG weekly x 1-4 or a physical treatment</td>
<td>IV SSG 20 mg/kg x 10-20 days</td>
</tr>
<tr>
<td>NWCL due to <em>L. Leishmania</em> species</td>
<td>IL SSG weekly x 1-4 or a physical treatment</td>
<td>IV SSG 20 mg/kg x 20 days</td>
</tr>
<tr>
<td><em>(L. mexicana complex)</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NWCL due to <em>L. Viannia</em> species</td>
<td>IV SSG 20 mg/kg x 20 days</td>
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</tr>
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<td><em>(L. braziliensis complex)</em></td>
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</tbody>
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Alternative CL Treatments

Physical treatments (curettage, cryotherapy, thermotherapy)  
May → dissemination, infection, relapse, larger scars, depigmentation

Several different imidazoles used in many case reports  
But all remain unproven (even fluconazole for L. major)

Miltefosine proven against VL in several good-quality trials  
But teratogenic & efficacy varies with different species causing CL

Amphotericin proven against VL in several good-quality trials  
But what dose & formulation (standard / liposomal) is best in CL?

Pentamidine (low-dose) used for L. guyanensis in French Guiana

Topical treatments (eg. paromomycin) now showing some promise
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