What’s hot where it’s hot: Update in travel and tropical medicine

Jay S. Keystone Medisys Travel Health
Edward C. Keystone RDU Mt. Sinai Hospital
Outline of this very talk

• malaria
• cysticercosis
• leishmaniasis
• travellers’ diarrhoea
**Interval between arrival and symptom onset**  
**USA 2010 N=1484 MMWR 2011;60:1-15**

<table>
<thead>
<tr>
<th>Interval mo.</th>
<th>% <em>P.falciparum</em> N=489</th>
<th>%<em>P.vivax</em> N=98</th>
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## Interval between arrival and symptom onset

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</tr>
</tbody>
</table>
Pf Malaria onset according to pre-existing immunity

Non-immunes n=197

- <10 d: 53%
- 10–20 d: 36%
- 21–30 d: 11%
- 31–59 d: 11%
- 60–180 d: 55%
- 181–365 d: 25%
- >1–2 y: 6%
- >2–3 y: 2%
- >3–4 y: 3%
- >4–5 y: 3%
- >5–6 y: 2%

Semi-immunes n=63

Sunday, 13 May, 12
Malaria Surveillance — United States, 2010
Among patients for whom reason for travel was known, 53% of the severe cases were in VFR travelers (comparable with 2009), of whom 53% specified acquisition from West Africa, and 93% of cases were identified as *P. falciparum* infections, similar to 2009. In addition, a significant increase occurred in the number of severe cases that were acquired in Haiti, a country where virtually all of the malaria that occurs is caused by *P. falciparum*. 
"I want to run a few tests on you, just to cover my ass."
Thick film

Thin film

diagnosis

speciation
If the first film is negative repeat it x 2 q12-24 hrs.
Binax ICT NOW test:
Histidine rich protein II+ malaria aldolase

A. Low + Pf

B. High + Pf
<table>
<thead>
<tr>
<th>Parasite</th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>P. falciparum</td>
<td>99%</td>
<td>94%</td>
</tr>
<tr>
<td>P. vivax</td>
<td>94%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Why admit with low Pf parasitemia?
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- *Once upon a time (2011)* there was a 35 year old woman who returned from West Africa with a 3 day history of fever.
Why admit with low Pf parasitemia?

- *Once upon a time (2011)* there was a 35-year-old woman who returned from West Africa with a 3-day history of fever.
  - looks unwell
Why admit with low Pf parasitemia?

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  - thrombocytopenia & mild anemia
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  - Looks unwell
  - Thrombocytopenia & mild anemia
  - *Plasmodium falciparum* parasitemia 1.1%

- 9 hours later: parasitemia 30%
Good Twin
Evil Twin

Sunday, 13 May, 12
Good Twin  Better twin

Sunday, 13 May, 12
## Artemether lumefantrine vs. Atovaquone proguanil

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Atovaquone proguanil (Malarone)</th>
<th>Artemether lumefantrine (Coartem)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Efficacy</strong></td>
<td>few treatment failures</td>
<td>few treatment failures</td>
</tr>
<tr>
<td>“fatty meal”</td>
<td>PCT 4 days, FCT 2 days</td>
<td>PCT 2 days, FCT 1 day</td>
</tr>
<tr>
<td><strong>Safety</strong></td>
<td>well tolerated</td>
<td>more GI upset and headache</td>
</tr>
<tr>
<td><strong>Convenience</strong></td>
<td>once daily doses over 3 days</td>
<td>6 doses over 3 days</td>
</tr>
<tr>
<td><strong>Cost (USD)</strong></td>
<td>106.79</td>
<td>100.00</td>
</tr>
</tbody>
</table>
Malaria Prevention in Short-Term Travelers

David O. Freedman, M.D.

This Journal feature begins with a case vignette highlighting a common clinical problem. Evidence supporting various strategies is then presented, followed by a review of formal guidelines, when they exist. The article ends with the author's clinical recommendations.

A family of three persons is planning a safari to southern Africa. The itinerary includes 3 days in Cape Town, South Africa, 3 days in Kruger National Park, South Africa, and 3 days in Victoria Falls, Zambia. The 31-year-old husband takes no medications currently, but he recently discontinued fluoxetine, which he had taken for depression. His 29-year-old wife, who won the trip in a corporate sales competition, is healthy and 15 weeks pregnant. Their 7-year-old child is in good health. How should the risk and prevention of malaria be managed in this family?
Why does Keystone recommend atovaquone/proguanil for only 3 days after exposure...is he nuts or has he got a good lawyer?
Short Report

Time to reappearance of malaria parasites following various drug treatment regimens in a holoendemic area of western Kenya*

G. D. Shanks¹, B. O. Ragama² and A. J. Oloo² ¹US Army Medical Research Unit—Kenya, Nairobi, Kenya; ²Kenya Medical Research Institute, Kisian, Kenya

Keywords: malaria, chemotherapy, halofantrine, quinine, doxycycline, atovaquone–proguanil, parasitaemia, Kenya

There is an inherent contradiction between non-immune study subjects and high malaria attack rates during a malaria intervention trial. If one has an adequately high malaria infection rate to get a statistically valid answer within a single malaria season, then most potential volunteers living in that community will have substantial malaria immunity. When testing new malaria interventions (drugs, vaccines, bednets, etc.) it is often difficult to account for the variability introduced by malaria immunity that cannot be quantified in any practical manner. One approach to this difficulty in endemic areas is to administer a treatment course of an antimalarial drug prior to starting the intervention and then assume that subsequent infections are newly acquired (BEIER et al., 1994). In many areas pyrimethamine–sulfadoxine is used because of its affordability and single-dose regimen. Although this drug combination unpublished observations). This report contains the collected experience over 3 years using 3 alternative treatment regimens to clear pre-existing blood parasites prior to chemoprophylaxis studies. We present these data in order to assist other investigators to evaluate what particular treatment regimen might be appropriate for use during malaria intervention trials requiring uninfected individuals from endemic areas.

Three malaria chemoprophylaxis clinical trials were conducted with adult volunteers in the same area of western Kenya near Lake Victoria during 1995–97 using the same procedures and staff (ANDERSEN et al., 1998; SHANKS et al., 1998; G. D. Shanks et al., unpublished). All studies were approved by the Kenyan National Ethical Review Committee and the Human Subjects Research and Regulatory Affairs Division of the US Army Surgeon General. All research subjects gave informed consent. During 1995 quinine 600 mg twice a day was combined with doxycycline 100 mg twice a day for 7 days ($n = 57$) (ANDERSEN et al., 1998); in 1996 atovaquone–proguanil (Malarone®, GlaxoWellcome) 1000 mg and 400 mg respectively daily for 3 days was used ($n = 65$) (SHANKS et al., 1998); and in 1997 halofantrine (Halfan®, SmithKline Beecham) 500 mg daily for 3 days was used ($n = 62$) (G. D. Shanks et al., unpublished). Statistical analysis consisted of construction of Kaplan–Meier graph for the 3 placebo groups.

The 3 placebo groups' Kaplan–Meier graph is shown in the Figure starting from the first day on which an antimalarial drug was given. The 3 re-infection curves show several similarities: in the first week no malaria parasites were seen, in weeks 2–3 a few persons developed parasitaemia in the quinine–doxycycline and halofantrine groups, and in week 4 the quinine–doxycycline curve began its sharp decline. A similar sharp decline in the proportion of persons without detectable parasitaemias occurred in the two other placebo groups.
Short Report

Time to reappearance of malaria parasites following various drug treatment regimens in a holoendemic region

This report contains the collected experience over 3 years using 3 alternative treatment regimens to clear pre-existing blood parasites prior to chemoprophylaxis studies. We present these data in order to assist other investigators to evaluate what particular treatment regimen might be appropriate for use during malaria intervention trials requiring uninfected individuals from endemic areas.

[Graph showing time since starting antimalarial medication (days) vs. persons with no detectable parasitaemia (%)]

unpublished observations).
Prolonged Protection Provided by a Single Dose of Atovaquone-Proguanil for the Chemoprophylaxis of *Plasmodium falciparum* Malaria in a Human Challenge Model

Gregory A. Deye,1 R. Scott Miller,1 Lori Miller,2 Carola J. Salas,4 Donna Tosh,2 Louis Macareo,1 Bryan L. Smith,1 Susan Fracisco,1 Emily G. Clemens,5 Jittawadee Murphy,3 Jason C. Sousa,1 J. Stephen Dumler,5 and Alan J. Magill1

1Division of Experimental Therapeutics, 2Clinical Trials Center, and 3Division of Entomology, Walter Reed Army Institute of Research, Silver Spring, Maryland; 4Naval Medical Research Unit 6, Lima, Peru; and 5Department of Pathology, Johns Hopkins University School of Medicine, Baltimore, Maryland

**Background.** We conducted a randomized, placebo-controlled, double-blind trial to establish the efficacy of atovaquone-proguanil to prevent malaria with the goal of simulating weekly dosing in a human *Plasmodium falciparum* challenge model.

**Methods.** Thirty volunteers randomly received 1 of the following dose regimens: (1) 250 milligrams of atovaquone and 100 milligrams of proguanil (250/100 milligrams) 1 day prior to infectious mosquito challenge (day −1), (2) 250/100 milligrams on day 4 after challenge, (3) 250/100 milligrams on day −7, (4) 500 milligrams of atovaquone and 200 milligrams of proguanil (500/200 milligrams) on day −7 or, (5) 1000 milligrams of atovaquone and 400 milligrams of proguanil (1000/400 milligrams) on day −7. All regimens included matching placebo such that all volunteers received identical pill numbers. Six volunteers served as open-label infectivity controls. Volunteers underwent mosquito sporozoite challenge with *P. falciparum* 3D7 strain. Follow-up consisted of serial microscopy and close clinical monitoring for 90 days.
Prolonged Protection Provided by a Single Dose of Atovaquone-Primaquine for the Chemoprophylaxis of Plasmodium falciparum Malaria in a Human Challenge Model

Clinical Infectious Diseases 2012;54(2):232–9

- effective dose intervals supportive of weekly dosing
- post-exposure prophylaxis 4 days after challenge was 100% effective
Update: New Recommendations for Mefloquine Use in Pregnancy

The Centers for Disease Control and Prevention (CDC) now recommends the antimalarial drug mefloquine for pregnant women both as a malaria treatment option and as an option to prevent malaria infection for all trimesters. Previously mefloquine was not recommended for the treatment of malaria in pregnant women. The change in recommendations is based on the recent Food and Drug Administration (FDA) re-categorization of mefloquine from a pregnancy category C drug to category B, based on their review of the published data on mefloquine use during pregnancy. These data showed that pregnant women who took mefloquine at various doses for both prevention and treatment of malaria did not have an increased risk of teratogenic effects (birth defects) or adverse pregnancy outcomes compared to the background rate in the general population. Based on studies, the FDA assigns risk categorizes for drugs used in pregnancy which include categories A, B, C, D, and X with categories A and B demonstrating the least risk to the pregnancy.

Malaria is a serious, sometimes fatal, mosquito-borne disease. Malaria infection in pregnant women can be more severe than in nonpregnant women and may also be transmitted from a mother to her unborn infant before or during delivery ("congenital" malaria). Malaria can increase the risk for adverse pregnancy outcomes, including prematurity, spontaneous abortion, and stillbirth. Pregnant women should avoid travel to malaria-endemic areas if possible. If travel cannot be avoided, malaria infection is largely preventable with the appropriate antimalarial drugs along with other measures to prevent mosquito bites.
Malaria summary

- VFRs at increasing risk of severe malaria
- VFRs present with malaria later than non-immunes
- Rapid diagnostics are ideal when expertise in diagnosis is sub-optimal
- Admit all with *P. falciparum* malaria
- Atov/proguanil may be D/C’d early post-exposure
- Mefloquine is safe for prevention in all trimesters of pregnancy.
Fluconazole treatment of *L. major* in Iran; RT n=120

J Acad Derm 2011;64:606-8

Cure at 6 weeks: (60/group)

48% w 200 mg
81% w 400 mg

Adverse events: “bothersome”

200 mg - none
400mg - 1 incr. LFTs and 1 incr. creatinine

- 75% cheilitis; 15% nausea
Fluconazole treatment of CL in Brazil due to *L.(V)braziliensis*

CID 2011;53:693-5

- **method:** N=28
- **Tx x 4 weeks ; no response..d/c; response..con’t to cure; well tolerated**

<table>
<thead>
<tr>
<th>dose mg/kg</th>
<th>number</th>
<th>cure %</th>
<th>duration (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>8</td>
<td>75</td>
<td>7.5 (4-12)</td>
</tr>
<tr>
<td>6.5</td>
<td>14</td>
<td>93</td>
<td>6 (4-10)</td>
</tr>
<tr>
<td>8</td>
<td>6</td>
<td>100</td>
<td>4 (4-5)</td>
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</tbody>
</table>
Summary: Fluconazole in Tx of Leishmaniasis

- **Saudia Arabia:** 200 mg > placebo in *L. major*

- **Iran:** 400mg > 200 mg in *L. major*

- **Brazil:** 8mg/kg > 6.5 mg/kg > 5 mg/kg in *L. braziliensis*

- **Bottom-line:** considering A/Es to SAGluconate. & liposomal ampho.B, fluconazole reasonable 1st choice when systemic therapy is required.
Treatment of cutaneous leishmaniasis among travellers

J. Blum1*, P. Desjeux2, E. Schwartz3,4, B. Beck1 and C. Hatz1

1Swiss Tropical Institute, Socinstrasse 57, 4002 Basel; 2World Health Organization, CPE/EPH, Avenue Appia 20, 1 Geneva 27, Switzerland; 3The Center for Geographic Medicine and Department of Medicine C, The Chaim Sheba Medical Center, Tel Hashomer 52621; 4Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel

Leishmaniasis is endemic in 88 countries on five continents. There are 1–1.5 million cases of cutaneous leishmaniasis reported yearly worldwide. There has been a sharp increase in recorded cases over the last 10 years. Based on geographical distribution, cutaneous leishmaniasis is divided into Old World and New World leishmaniasis. In the past, species could be inferred from geographical setting or determined by performing culture and isoenzyme analysis. The recently developed and now widely available PCR technology allows a rapid diagnosis with determination of most species, and thus enables a species-orientated treatment. While the Old World species mostly cause benign and often self-limiting cutaneous disease, the American species cause a broad spectrum of conditions from benign to severe manifestations, including mucosal involvement. The response to treatment varies according to the species. Therefore, a species-specific approach is proposed. Drugs for systemic and topical treatment are presented and discussed with regard to their application, use and adverse effects. Indications for local or systemic treatment are proposed. Drugs under investigation are also mentioned. An overview of published treatment options and a treatment recommendation is given for each of the most important species. The level of evidence of the studies leading to these recommendations is given.
Cryotherapy +/- SAG infiltration weekly x 1-3

Advance the needle whilst injecting under pressure in the dermis, covering the whole lesion including the centre.
Comparative study of the efficacy of combined cryotherapy and intralesional meglumine antimoniate (Glucantime®) vs. cryotherapy and intralesional meglumine antimoniate (Glucantime®) alone for the treatment of cutaneous leishmaniasis in Iran

A. Asilian, MD, A. Sadeghinia, MD, G. Faghihi, MD, and A. Momeni, MD


Abstract

Background Cutaneous leishmaniasis (CL) is a parasitic disease caused by *Leishmania* species. There is a need for more effective and less time-consuming therapeutic methods for this condition.

Aim To evaluate the efficacy of combined cryotherapy and intralesional meglumine antimoniate (MA) (Glucantime®, Specia, Paris, France) for the treatment of CL.

Methods Patients were divided into three groups: Group 1, 100 patients with 149 lesions were treated with cryotherapy plus intralesional MA; Group 2, 200 patients with 230 lesions were treated with cryotherapy; Group 3, 100 patients with 160 lesions were treated with intralesional MA. These groups were followed for 6 months after the end of treatment.

Results The results showed complete cure in 90.9% of cases in Group 1, 57.15% of cases in Group 2, and 55.63% of cases in Group 3. The difference between Group 1 and the other groups was statistically significant (*P* < 0.05).

Conclusions Combined cryotherapy and intralesional MA is more effective than either
Comparative study of the efficacy of combined cryotherapy and intralesional meglumine antimoniate (Glucantime®) vs. cryotherapy and intralesional meglumine antimoniate (Glucantime®) alone for the treatment of cutaneous leishmaniasis in Iran

### Table 1  Comparison of clinical results between Groups 1, 2, and 3

<table>
<thead>
<tr>
<th>Group</th>
<th>No. of patients</th>
<th>No. of lesions</th>
<th>No. of cured lesions</th>
<th>Cure rate (%)</th>
<th>Failure rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IL+cryo</td>
<td>93</td>
<td>132</td>
<td>120</td>
<td>90.9</td>
<td>9.09</td>
</tr>
<tr>
<td>Cryo</td>
<td>185</td>
<td>210</td>
<td>90</td>
<td>57.15</td>
<td>42.85</td>
</tr>
<tr>
<td>IL</td>
<td>92</td>
<td>151</td>
<td>84</td>
<td>55.63</td>
<td>44.37</td>
</tr>
</tbody>
</table>

The cure rate in the IL+cryo group was statistically significant (P < 0.05).

Conclusions: Combined cryotherapy and intralesional IL is more effective than either alone.
Some *Leishmania* parasites contain an RNA virus which promotes the production of pro-inflammatory molecules such as TNF α, IL-6, CXCL10, and CCL5.

The response to the virus is mediated by the TLR 3 gene product (TLR3), an RNA receptor that is expressed within the same endosomal compartment as the parasites.

Viral RNA released by dead parasites soon after infection binds to TLR3 and results in the production of cytokines and chemokines that enhance inflammatory responses and thus exacerbate disease.

*Science 2011; 331:775-8.*
Leishmania summary

- Fluconazole may be a reasonable option for systemic therapy; larger studies are needed.
- Old world leish and non-brasiliensis species may be managed with Pentostam infiltration plus cryotherapy.
- Toll-like receptors may be an NB factor in leish pathogenesis.
Seroprevalence of Antibodies against *Taenia solium* Cysticerci among Refugees Resettled in United States

Seth E. O’Neal, John M. Townes, Patricia P. Wilkins, John C. Noh, Deborah Lee, Silvia Rodriguez, Hector H. Garcia, and William M. Stauffer
Sunday, 13 May, 12

Myanmar  23%

Laos    18%

Burundi  26%

Bhutan  23%

N= ~500/group
Cysticercosis of the central nervous system: how should it be managed?
Hector H. Garcia\textsuperscript{a,b}, Armando E. Gonzalez\textsuperscript{c} and Robert H. Gilman\textsuperscript{d}

\textsuperscript{a}Department of Microbiology, Center for Global Health – Tumbes, Universidad Peruana Cayetano Heredia, \textsuperscript{b}Cysticercosis Unit, Instituto Nacional de Ciencias Neurologicas, \textsuperscript{c}Department of Veterinary Public Health, School of Veterinary Medicine, Universidad Nacional Mayor de San Marcos, Lima, Peru and \textsuperscript{d}Department of International Health, Johns Hopkins University Bloomberg School of Public Health, Baltimore, Maryland, USA

Correspondence to Hector H. Garcia, MD, PhD, Professor, Department of Microbiology and Director, Center for Global Health – Tumbes, Universidad Peruana Cayetano Heredia, Lima, Peru
Tel: +51 1 3287360; e-mail: hgarcia@jhsphs.edu

Current Opinion in Infectious Diseases 2011, 24:423–427

Purpose of review

*Taenia solium* neurocysticercosis (NCC) has been long recognized as an important cause of neurological morbidity in most of the world. Unwarranted generalization of diagnostic and treatment recommendations made it difficult to assess individual prognosis and responses for each type of NCC. Understanding of the main clinical presentations (dependent on number, location, size, and stage of parasites, as well as on the immune response of the host) allows a better view of treatment options and expected outcomes.

Recent findings

Current treatment options are still limited and involve symptomatic agents, antiparasitic agents, or surgery. The importance of adequate symptomatic management, the potential for improved antiparasitic treatment regimes, in particular combination therapy, and the increasingly important role of minimally invasive neurosurgery are also reviewed in this article.

Summary
Stages of parenchymal neurocysticercosis

vescicular

viable
Stages of parenchymal neurocysticercosis

vescicular
viable
degenerating
dying
Stages of parenchymal neurocysticercosis

vescicular
degenerating
viable
dying

colloidal
life support
Stages of parenchymal neurocysticercosis

vescicular
  viable

colloidal
  life support

degenerating
dying

calcified
dead
Figure 3. Forest plot showing the effects of cysticidal drugs on lesion resolution in trials of patients with intracranial cystic lesions.
Meta-analysis drug therapy for neurocysticercosis
Del Brutto, Ann Int Med 2006;145:43-51

Figure 4. Forest plot showing the effects of cysticidal drugs on seizure recurrence in patients with parenchymal brain-enhancing lesions.
Viable lesions in adults, albendazole = placebo for recurrence of seizures (116 participants, one trial); albendazole > placebo for lesion resolution (RR 0.56,); 192 participants, two trials).

Non-viable lesions in children, seizure recurrence; albendazole > no treatment (RR 0.49), 329 participants, four trials). No difference in the persistence of lesions at follow up (570 participants, six trials).
Author’s conclusions

Viable lesions: albendazole may reduce the number of lesions.

Non-viable (dying) lesions: seizure recurrence was substantially lower with albendazole,
Combination Therapy With Albendazole and Praziquantel Versus Albendazole Alone in Children With Seizures and Single Lesion Neurocysticercosis

A Randomized, Placebo-Controlled Double Blind Trial

Savit Kaur, MD, Pratibha Singht, MD, Sunit Singht, MD, and Niranjan Khandelwal, MD

Background: A combination of albendazole and praziquantel was more effective than albendazole alone in destroying Taenia cysts in an animal model. There are no such studies in humans.

Objective: To evaluate the efficacy and safety of a combination of albendazole and praziquantel in children with seizures and single small enhancing computerized tomographic lesions.

Study Type: Prospective, interventional, randomized, placebo-controlled, double blind clinical trial at a tertiary hospital in North India.

Subjects: One hundred twelve children with seizures for <3 months and single lesion neurocysticercosis; 9 lost to follow-up.

Intervention: All children received albendazole (15 mg/kg/d) for 7 days with either praziquantel or placebo (75 mg/kg/d) for 1 day according to random allocation. Repeat CT scans were done after 1, 3, and 6 months. All children were followed up for at least 6 months.

Results: Fifty-three children received praziquantel (group A) and 50 placebo (group B). Complete resolution of lesions was seen in 60% and 72% of children at 3 and 6 months in group A versus 42% and 52% of children in group B.

Praziquantel and albendazole, both have been used for nearly 2 decades and several studies have demonstrated their efficacy in the treatment of single lesion neurocysticercosis. However, controversy still exists regarding the management of enhancing lesions. A randomized double blind placebo controlled trial reported that albendazole therapy results in significantly faster and increased resolution of lesions and reduces the risk of late seizure recurrences. In a recent meta analysis, the authors concluded that cysticidal therapy results in better resolution of colloid and vesicular cysticerci, lowers the risk for recurrence of seizures in patients with colloid cysticerci, and reduces the rate of generalized seizures in patients with vesicular cysticerci.

In a number of comparative trials, albendazole was more effective than praziquantel for treatment of parenchymal cysticercosis and has become the cysticidal drug of choice. A single day therapy with praziquantel 25 mg/kg/dose for 3 doses has been as effective as 1 week of albendazole therapy. Not all the cases show response to either of these therapies. In an in vitro study by...
Calcified Cysticerci Provoke Perilesional Edema and Seizures

Theodore E. Nash,1 Javier Pretell,2 and Hector H. Garcia3

1Laboratory of Parasitic Diseases, National Institutes of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Maryland; and 2Cysticercosis Unit, Instituto de Ciencias Neurológicas and 3Departments of Microbiology and Pathology, Universidad Peruana Cayetano Herédia and Cysticercosis Unit, Instituto de Ciencias Neurológicas, Lima, Peru

In cases of cysticercosis, seizures and other symptoms occur in persons with only calcified brain lesions. The presence of perilesional edema has been documented in association with calcified lesions in symptomatic patients, but the frequency of this complication and characteristics of the patients who develop it are not known. Patients in Peru and the United States with neurocysticercosis, documented by positive results of serological testing and with only calcified lesions as shown using computerized tomography, were studied using magnetic resonance imaging. Perilesional edema was observed in slightly more than one-third of the patients, and some patients had frequent, severely disabling episodes. Those with an increased proportion of enhancing calcified lesions were more likely to show perilesional edema. Edema around calcified lesions is common in this population and is associated with seizures and neurological morbidity.

Cysticercosis, an infection of the larval form of the tapeworm *Taenia solium*, is a major cause of seizures patients with perilesional edema around calcified lesions have been fully described. However, from the in-
Neurocysticercosis summary

• Albendazole treatment of viable parasites reduces number of lesions
• Albendazole treatment of dying parasites reduces seizure recurrence
• Calcified cystercerci provoke oedema and seizures
• Albendazole plus praziquantel may be better than albendazole alone
Do travellers adhere to food and water precautions?

Kozicki, Int. J. Eidem.198514;169-72
Do travellers adhere to food and water precautions? NOT a Chance!

Kozicki, Int. J. Eidem.198514;169-72
Do travellers adhere to food and water precautions? NOT a Chance!

97% of travellers make a food and water ‘faux pas’ within 72 hours of arrival

Kozicki, Int. J. Eidem.198514;169-72
# Etiology of Travellers’ Diarrhea

<table>
<thead>
<tr>
<th>Agent</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>EAEC + ETEC*</td>
<td>50-70</td>
</tr>
<tr>
<td>Salmonella, shigella, campy.</td>
<td>0-20</td>
</tr>
<tr>
<td>Protozoa (giardia, crypto.Eh)</td>
<td>0-5</td>
</tr>
<tr>
<td>Viruses (rotavirus, norovirus**)</td>
<td>0-20</td>
</tr>
<tr>
<td>Unknown</td>
<td>10-40</td>
</tr>
</tbody>
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* SE Asia: ETEC 7% Campylobacter 32%  Am.J.TMH 2009;8:609

ATTACK OF THE SUPERBUGS: ANTIBIOTIC RESISTANCE

By Grace Yim

In the past 50 years, antibiotics have been critical in the fight against many diseases and infections. Their discovery was one of the leading causes for the dramatic rise of average life expectancy in the 20th century and their significance to public health would be impossible to overstate. Antibiotics are defined as any compound which either kills or severely impedes the growth of bacteria. Upon the introduction of penicillin into general clinical practice in 1944, formerly deadly illnesses such as Strep throat and tuberculosis became instantly curable. Today, our dependence on antibiotics is absolute. In 1998, in the United States, it was estimated that there were 80 million prescriptions of antibiotics for human use, the equivalent of about 12,500 tons in one year. When animal and agricultural uses of antibiotics are added to human use, it is estimated that in the past 50 years, more than 1 million tons have been produced and disseminated.
In Vitro Antimicrobial Susceptibility of Bacterial Enteropathogens Isolated from International Travelers to Mexico, Guatemala, and India, 2006-2008

Jeannette Ouyang-Latimer\textsuperscript{1,2}, Syed Jafri\textsuperscript{2}, Audrey VanTassell\textsuperscript{2}, Zhi-Dong Jiang\textsuperscript{2}, Kaur Gurleen\textsuperscript{3}, Savio Rodriguez\textsuperscript{3}, Ranjan K. Nandy\textsuperscript{4}, Thandavaryan Ramamurthy\textsuperscript{4}, Santanu Chatterjee\textsuperscript{5}, Robin McKenzie\textsuperscript{6}, Robert Steffen\textsuperscript{7} and Herbert L DuPont\textsuperscript{1,2,8}
<table>
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<tr>
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<th>Mexico</th>
<th>Guatemala</th>
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<tr>
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<td>EAEC (3)</td>
<td>ETEC (98)</td>
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<tr>
<td>NAL</td>
<td>67</td>
<td>71</td>
<td>55</td>
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<tr>
<td>CIP</td>
<td>0</td>
<td>28</td>
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<tr>
<td>AZM</td>
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<tr>
<td>RIF</td>
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MIC90 CLSI breakpoints
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**MIC90 CLSI breakpoints**
Epidemiology of Travelers’ Diarrhea

Figure 1. Percentage of travelers’ diarrhea caused by enterotoxigenic Escherichia coli among travelers. Adapted from 2.

Epidemiology of Travelers’ Diarrhea

Figure 1. Percentage of travelers’ diarrhoea caused by enterotoxigenic Escherichia coli among travellers. Adapted from 2.
Management of Travelers’ Diarrhea by Local Physicians in Tropical and Subtropical Countries—A Questionnaire Survey

Maria N. Wyss, Cand Med, Robert Steffen, MD, Nitin Y. Dhupdale, MD, Sumit Thitiphuree, MD, and Margot Mutsch, PhD, MPH

*Division of Epidemiology and Prevention of Communicable Diseases, World Health Organization Collaborating Centre for Travellers’ Health, Institute of Social and Preventive Medicine, University of Zurich, Zurich, Switzerland; †Department of Preventive and Social Medicine, Goa Medical College, Bambolim, Goa, India; ‡Phuket International Hospital, Phuket, Thailand

DOI: 10.1111/j.1708-8305.2009.00335.x

Background. There is an ongoing debate as to whether patients with travelers’ diarrhea (TD) should self-medicate with a travel kit in developing countries or whether they should consult local doctors. Thus, we have analyzed TD management conducted by local health professionals.

Methods. Practicing physicians recommended to tourists in Goa (India), Mombasa (Kenya), and Phuket (Thailand) were invited to participate in a cross-sectional questionnaire survey. Three TD case descriptions were presented, and suggested diagnostic and therapeutic procedures were analyzed.

Results. In each of the three locations, approximately 20 physicians (5% in total, response rate 95%) completed the questionnaires. Oral rehydration was proposed by more than 80% of the physicians for mild cases of TD and for TD with vomiting, while 73% of them would have treated febrile TD patients orally and 17% would have used intravenous (IV) fluids. Antimicrobials, primarily fluoroquinolones, would have been prescribed for 61, 73, and 95%, respectively, of these three cases. Cephalosporins, aminoglycosides (usually IV gentamicin), IV amoxicillin, and once co-trimoxazole were recommended. Many medical doctors added nitroimidazole to the antibiotic therapy. Multiple symptomatic drugs would have been prescribed. The rate of invasive procedures (infusions, injections, and diagnostic venipuncture) would have ranged from 20% to 86% in the scenarios of the different patients. Mainly practitioners who owned a clinic would have hospitalized patients with TD.

Conclusions. Many physicians in destination countries treat TD patients similarly to the treatments prescribed in the “Western world.” A minority uses obsolete antimicrobials. Polypharmacy and the high rate of invasive procedures with a theoretical risk of nosocomial infection are of concern. Training initiatives for both local physicians and travelers might be beneficial, and the guidelines should be based on internationally accepted expert advice.
3 Scenarios presented to 60 physicians in Phuket, Mombasa, Goa (~20/site)

Scenario: fever, diarrhea, abd pain, fever

Results:
- rehydration: 73%
- symptomatic Tx: 100%
- IM/IV: 59%
- antibiotics: 73% (FLQ, CFT, TMS, AMX)
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Fig 2 Number of injections per person and per year and proportion of these administered with injection equipment reused in the absence of sterilisation, by region, 2000.
Travellers’ diarrhea

• ETEC and EAEC most frequent cause of TD; norovirus and campylobacter increasingly NB.
• Drug resistance of enteric pathogens on the rise
• FLQ for Africa and W. hemisphere; azithromycin for Indian SC and SE Asia
• Self-treatment of TD avoids risk of unsterile injections by local physicians.