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Note

Characteristics of health problems in returned overseas travelers at a tertiary teaching hospital in a suburban area in Japan[☆]

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ABSTRACT

Few studies have analyzed the characteristics of patients who develop physical disorders after overseas travel. We retrospectively reviewed the medical records of 183 patients who visited Nara Medical University Hospital from 2008 to 2016 because of physical problems after traveling abroad. The main travel destinations were Southeast Asia ($n = 100$), Africa ($n = 27$), and South Asia ($n = 23$). The main reasons for the travel were leisure ($n = 96$), business ($n = 51$), and volunteer work ($n = 19$). The most common final diagnosis was gastrointestinal disease ($n = 72$), followed by febrile disease ($n = 59$) and respiratory disease ($n = 19$). There were eight malaria cases, including one patient who was infected after <14 days of overseas travel. Additionally, 61 of 71 cases of travelers' diarrhea and 15 of 21 cases of dengue fever occurred after <14 days travel. 26 cases of vaccine preventable diseases, such as hepatitis A, typhoid fever, and influenza, were observed. Consequently, healthcare providers should notify Japanese overseas travelers that there is a non-negligible health risk inherent to short-term travel, while stressing on the importance of pre-travel medical consultation.

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Over 16 million Japanese traveled overseas in 2015 [1]. With the increasing number of people who travel to Southeast Asia, South Asia, the Middle East, and Sub-Saharan Africa [2], the importance of proper diagnosis and treatment of tropical diseases is emphasized. In this regard, Japanese physicians require information on the clinical features of tropical diseases; however, very few relevant Japanese studies exist [3–5]. We examined the clinical characteristics of patients who presented to our hospital with post-travel health problems.

Nara Medical University is 30 min by car or train from Osaka, which is the third largest city in Japan. Our university is situated approximately 20 km south of the center of Nara, a city that attracts tourists from all over the world. The university hospital is a tertiary teaching hospital that has 978 beds, nine of which are allocated to

the Center for Infectious Diseases, and includes 10 doctors who specialize in infectious diseases and infection control.

Nara Medical University is involved in the Research Group on Chemotherapy of Tropical Diseases, which was established in order to provide tropical disease medicines that have not been approved for production in Japan. Therefore, many of the patients who live in and around Nara prefecture and who develop diseases related to overseas travel are referred to our university hospital.

We retrospectively reviewed the medical records of patients who presented to our institution from January 2008 to December 2016 with health problems after overseas travel. The collected information included age, sex, travel destination, travel purpose, travel period, symptoms, final diagnosis (as per GeoSentinel Surveillance classification [6]), presence of pre-travel health consultation, and vaccination history. At least two doctors independently confirmed the final diagnosis via cross-checking of the medical records. The research was approved by the institutional review board (No. 1581) and was completed according to the relevant

[☆] We declare that all authors meet the ICMJE authorship criteria.

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national regulations, institutional policies, and the tenets of the Helsinki Declaration.

A total of 183 patients (77 women [42.1%] and 106 men [57.9%], with a median age of 31 years [range, 1–78 years]) were enrolled. All but five patients were Japanese citizens. The most popular travel destination was Southeast Asia ($n = 100$, 56.4%), followed by Africa ($n = 27$, 14.7%) and South Asia ($n = 23$, 12.6%). The most common travel purpose was leisure ($n = 96$, 52.4%), followed by business ($n = 51$, 27.9%) and volunteer work ($n = 19$, 10.4%). These data are shown in Table 1.

Upon returning to Japan, the patients presented with febrile diseases ($n = 59$, 32.2%), gastrointestinal illness ($n = 72$, 39.3%), respiratory illness ($n = 19$, 10.4%), dermatologic conditions ($n = 9$, 4.9%), oral and dental illnesses ($n = 7$, 3.8%), neurologic illness ($n = 1$, 0.5%), genitourinary and sexually transmitted diseases (STDs) ($n = 1$, 0.5%), and unclassified illness ($n = 15$, 8.2%).

There were 59 cases of febrile diseases, including 21 of dengue fever from Indonesia ($n = 8$), Thailand ($n = 4$), India ($n = 4$), Malaysia ($n = 2$), Singapore ($n = 1$), Laos ($n = 1$), and Tonga ($n = 1$). Eight cases of malaria were from Uganda ($n = 2$), Kenya ($n = 2$), Mozambique ($n = 1$), Cameroon ($n = 1$), and Indonesia ($n = 1$). Four cases of typhoid fever were from India ($n = 2$), Malaysia ($n = 1$), and Thailand ($n = 1$). Three cases of measles were from Mongolia, the Philippines, and Malaysia. The single case of rubella was from India. There were eight malaria patients; seven had falciparum malaria, and one had *P. ovale* malaria. Four individuals who returned from Indonesia, Uganda, Cameroon, and Kenya presented with severe malaria. Seven of the eight patients with malaria consulted travel clinics; however, only one patient with *P. ovale* malaria, whose destination was Uganda, completed appropriate malaria

prophylaxis with mefloquine. Patients with cat scratch disease ($n = 1$, from the United States) and adult-onset Still's disease ($n = 1$) were classified as having febrile diseases.

Stool examination was performed in 41 of 71 cases of patients with travelers' diarrhea; in 24 patients, the etiology was determined. *Campylobacter jejuni* was detected in travelers from mainland China ($n = 2$), India ($n = 2$), Cambodia ($n = 1$), and Thailand ($n = 1$). *Plesiomonas shigelloides* was detected in travelers from Cambodia ($n = 3$), India ($n = 1$), and Thailand ($n = 1$). Enterotoxigenic *Escherichia coli* was detected in travelers from Indonesia ($n = 3$), mainland China ($n = 2$), the Philippines ($n = 1$), and Vietnam ($n = 1$). *Salmonella enteritidis* was detected in travelers from Malaysia ($n = 1$) and Indonesia ($n = 1$). *Shigella sonnei* was detected in one traveler from India. Among patients with gastrointestinal illness other than travelers' diarrhea, the causes were oxyuriasis ($n = 1$, from Micronesia); amoebic dysentery ($n = 1$, from Cambodia); colitis with septicemia due to *Vibrio vulnificus* ($n = 1$, from Thailand); and *Giardia* infection ($n = 1$, from Ghana). A single case of autoimmune pancreatitis was also included in the gastrointestinal diseases.

Patients diagnosed with respiratory illness included cases of influenza ($n = 14$), acute bronchitis ($n = 4$), chronic cough ($n = 1$), pneumothorax ($n = 1$), and pneumonia ($n = 1$); however, a direct relationship between these diseases and travel was unclear. The dermatologic diseases included cellulitis ($n = 3$); animal bites ($n = 3$, from Thailand, Cambodia, and Myanmar); and cutaneous leishmaniasis ($n = 1$, from Saudi Arabia).

We classified cases of acute pharyngitis ($n = 7$), aseptic meningitis ($n = 1$), and urinary tract infection ($n = 1$) as oral and dental diseases, neurologic diseases, and genitourinary and sexually transmitted diseases respectively. The distribution of the final diagnoses and the duration of travel of the 183 patients are summarized in Table 2.

The median duration of travel for patients with traveler's diarrhea, dengue fever, and malaria was 8 (range, 3–210), 7 (range, 3–720), and 51 (range, 10 to approximately 3600) days, respectively. At least 57 patients consulted a travel clinic before departure, and 35 (61.4%) of these individuals had written records of vaccination (Table 3). The median (range) duration of travel in 57 patients who received pre-travel medical consultation was not significantly different from that in 126 people who did not receive pre-travel medical consultation [4 days (range, 4 days to 5 years) vs. 8 days (range, 3 days to 10 years); $p = 0.32$; Mann Whitney *U* test using "R" version 3.2.1.]. The purposes of travel in the 57 patients were sightseeing ($n = 21$), business ($n = 20$), residence ($n = 4$), volunteer work ($n = 6$), missionary work ($n = 3$), and visiting friends and relatives ($n = 2$). Data on provision of expenses for pre-travel medical consultation and the frequency of use of prophylaxis against malaria and altitude sickness were not available in the medical records and could not be analyzed.

Twenty-six patients had vaccine preventable diseases (VPDs) in our study. The breakdown of VPDs is as follows: 14 cases of influenza, four with hepatitis A, four with typhoid fever, three of measles, and one case of rubella.

According to our findings, dengue fever was the most common cause of febrile illness. In contrast, previous Western research has reported malaria as the most common cause of febrile illness [7–9]. According to the World Tourist Organization survey, travel to Southeast Asia was less frequent in British than in Japanese individuals [10,11]. The higher risk of malaria in Africa than in Asia [8] likely affected the differences in results.

Sixty-one cases of traveler's diarrhea and 15 cases of dengue fever occurred after a short-term travel of less than 14 days. Therefore, overseas travelers and healthcare providers must be aware that there is a health risk even if the travel period is short. In

Table 1
The Characteristics of patients after overseas travel in Nara Medical University.

| | (n=183) | |
|---------------------------------|---------|------|
| | Count | % |
| Age | | |
| median | 31 | |
| range | 1–78 | |
| Sex | | |
| male | 106 | 57.9 |
| female | 77 | 42.1 |
| Location of treatment | | |
| outpatient | 136 | 74.3 |
| inpatient | 47 | 25.7 |
| Nationality | | |
| Japanese | 176 | 96.2 |
| Others | 7 | 3.8 |
| Travel purpose | | |
| Leisure | 96 | 52.5 |
| Business | 51 | 27.9 |
| Volunteer | 19 | 10.4 |
| Residence (>60 days) | 13 | 7.1 |
| VFRs | 4 | 2.2 |
| Destination | | |
| Asia | 132 | 72.1 |
| Southeast Asia | 100 | 54.6 |
| South Asia | 23 | 12.6 |
| East Asia | 13 | 7.1 |
| Western Asia | 4 | 2.2 |
| Africa | 27 | 14.8 |
| Oceania | 7 | 3.8 |
| Europe | 6 | 3.3 |
| Latin America | 6 | 3.3 |
| North America | 1 | 0.5 |
| Pre-travel Medical consultation | | |
| consulted | 57 | 31.1 |
| not consulted | 54 | 29.5 |
| no record | 72 | 39.3 |

VFRs: Visiting Friends and Relatives.

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