Post-Travel Consultations in a Regional Hub City Hospital, Japan

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Abstract

Background

To clarify the characteristics of post-travel consultation services in Japan, particularly in the provinces, we analyzed our post-travel patients in the travel clinic of Kurume University Hospital located in Kurume city (a regional hub city in southwestern Japan).

Methods

Sixty post-travel patients visited our clinic between April 2008 and October 2014 and participated in this study: 55 were Japanese and five were foreign. We summarized and compared the characteristics of the patients after dividing the Japanese participants into long-term travelers (> 14 days) and short-term travelers (<= 14 days). The foreign travelers were described in a separate analysis.

Results

Of the 55 Japanese travelers, the mean age (± standard deviation) was 37.3±16.3 years, and 36 patients (65%) were men. Southeast Asia was the major destination (30/55, 55%), and business was stated as the major reason for travel (16/55, 29%). Post-exposure rabies prophylaxis (16/55, 29%) was the most common purpose for the consultations. There were 34 participants (62%) who were classified as short-term travelers. Fewer of the short-term travelers stated receiving pre-travel consultations compared with long-term travelers (11% vs. 79%, p=0.0002). The five foreign travelers included one dengue fever patient and two malaria patients.

Conclusion

Most post-travel Japanese patients admitted to our clinic were short-term travelers who had not received any pre-travel consultation. One of the most common complaints, post-exposure rabies prophylaxis, could have been avoided to some extent by appropriate pre-travel consultations. The results of this study suggest that pre-travel consultations should therefore be encouraged for both long- and short-term travelers.

Key words: Japanese travelers; post-travel consultation; pre-travel consultation; provinces; post-exposure rabies prophylaxis; traveler's diarrhea.

Main text

Introduction

Approximately seventeen million Japanese travel abroad annually (1). Travel to tropical areas (e.g., southeast and south Asia) has become more popular among Japanese travelers (2). In foreign countries (particularly in tropical areas), travelers encounter many health hazards that are uncommon in Japan. In 2000, Basnyat et al. (3) reported that 90% of Japanese travelers who visited their clinic in Nepal for medical problems had no vaccination records. In recent years, the number of travel clinics in Japan has increased mainly for the purpose of pre-travel consultation; however, the service for travelers is insufficient (4), particularly for short-term travelers. In our clinic, only 14% of pre-travel clients are short-term travelers (<=14 days) (unpublished data). In addition, few facilities also provide post-travel consultation, particularly in the provinces.

Kurume University Hospital is located in Kurume City (Fukuoka Prefecture, Japan), which has a population of approximately three hundred thousand. Fukuoka International Airport, which is the nearest airport, offers direct flights to Asian countries (e.g., China, India, and Thailand) (5). Our travel clinic initiated pre-travel consultations beginning in 2007 and added post-travel consultations in 2008 at the university hospital.

Reports of post-travel consultations in Japan are quite limited in the literature, and most are focused on urban, rather than rural, areas (6,7). We herein report the practice of a Japanese travel clinic in a province, in order to clarify the characteristics of post-travel consultation in Japanese provinces.

Patients and Methods

This research involved a single center and was conducted by the Department of Infection Control and Prevention, which manages the travel clinic of Kurume University Hospital, a 1,025-bed tertiary care medical center. Between April 2008 and October 2014, our clinic served 60 post-travel patients (including patients of foreign nationality). We retrospectively reviewed their medical charts and classified their factors as follows: age, sex, nationality, duration of travel, purpose of travel, destinations of participants or countries they came from, whether they had or had not received a pre-travel consultation, and their diagnoses. We summarized the characteristics and classified the Japanese participants as either long-term travelers (> 14 days) or short-term travelers (<= 14 days) and performed a comparative study. In addition, foreign travelers were described apart from the comparative study.

All statistical analyses were performed using the JMP Pro software program (version 11.0.0, SAS Institute, Inc., Cary, USA). Categorical data were tested using Fisher's exact test, and continuous data were tested using Student's *t*-test. A p-value < 0.05 was considered to be statistically significant.

The Kurume University Research Ethics Committee (http://www.med.kurume-u.ac.jp/med/joint/rinri/) approved this study (Research No. 14214).

Results

Sixty travelers (55 Japanese and five foreign travelers) visited our clinic. The characteristics of the Japanese post-travel patients are described in Table 1. Of 55 Japanese travelers, the mean age (± standard deviation) was 37.3±16.3 years, and 36 patients (65%) were men. The duration of travel varied from 3 days to 1,580 days and

most of the trips were short-term (34/55, 62%). The major reason for travel (16/55, 29%) was stated as business. Only 14 travelers (25%) stated that they had received a pre-travel consultation. The mean interval between travel return and admission to our clinic was 7.2 days (range, 0-62). Table 2 lists the diagnoses and destinations of Japanese post-travel patients. Southeast Asia was the major travel destination (30/55, 55%), in particular the Philippines (10/55, 18%) and Thailand (10/55, 18%). Post-exposure rabies prophylaxis (16/55, 29%) was the most common purpose of the post-travel consultations (dog bite/scratch: 9, cat bite/scratch: 5, monkey bite/scratch: 2 patients), which was followed by traveler's diarrhea (15/55, 27%) (Table 2). The intervals (days) between the animal bite/scratch and the first administration of post-exposure rabies vaccine were one day for three patients, and four, five, 10, and 14 days for one patient each, respectively. Nine patients (56%) were administered vaccine at day 0. Only one patient (6%) had received pre-exposure rabies prophylaxis.

A comparative analysis of the short-term and long-term Japanese travelers is described in Table 3. There were 34 short-term travelers (62%). Fewer subjects in the short-term group stated that they had received a pre-travel consultation (11% vs. 79%, p=0.0002). Additionally, there were no significant differences in age, sex or purpose of travel between the short-term and long-term travelers. A greater proportion of short-term travelers reported traveler's diarrhea compared to long-term travelers (41% vs. 6%, p=0.01).

In addition, we summarized the characteristics of the five foreign travelers. The mean age (± standard deviation) was 23.8±6.3 years and four patients (80%) were men. There was one patient each from India, the Philippines, Thailand, and Sudan. These patients had contracted diseases in their homelands: Dengue fever in the

Philippines, post-exposure rabies prophylaxis (dog bite) in Thailand, and malaria (*Plasmodium vivax*) in India and Sudan. The nationality of one of the foreign patients was not available, and this patient suffered from traveler's diarrhea contracted in the Philippines.

Discussion

In the present study, most of our Japanese post-travel patients were young, short-term travelers to Asian countries, who had not received any pre-travel consultation. Most of our post-travel patients had contracted post-exposure rabies prophylaxis and traveler's diarrhea. A similar analysis concerning post-travel consultation for Japanese subjects was previously published. Mizuno et al. (6) detailed a two-year experience of 345 post-travel Japanese cases. The most common problem was gastrointestinal symptoms (39.1%), followed by respiratory tract infections (16.2%) and animal bites (8.1%). Shirano et al. (7) also reported approximately 116 post-travel Japanese cases with a fever or diarrhea over a 5-year period (not including post-exposure rabies prophylaxis). Many (44%) of their patients had common infectious diseases. Although the results of two previous reports were compatible with the diagnoses of our patients, those studies reported more tropical diseases than we observed in our study. Their studies were performed in tertiary care hospitals in two of the largest cities in Japan, Tokyo and Osaka. Each of those cities has a much larger population than Kurume City (9.15 million in the special wards of Tokyo and 2.67 million in Osaka City) and much larger international airports (Haneda, Kansai, and Narita). These airports also have flights to Asian countries and no direct flights to Africa (8-10), but do have flights to the Middle-east, which harbors transit airports to malaria-endemic African countries. The

risk of encountering malaria in Africa is significantly higher than the risk in Asia (11), and the risk of acquiring traveler's diarrhea is the highest in west/central Africa (12). These facts account for the differences in the number of cases of tropical diseases between our results and those of the previous studies. However, the prevalence of febrile tropical diseases among foreign patients was more common than those among Japanese travelers, although there were a few cases. We should reduce the threshold for suspecting tropical diseases, such as dengue and malaria, in our examinations of foreign travelers from endemic countries.

The interval between travel return and admission in most patients (65%) was short (< 10 days) (Table 1). Post-exposure rabies prophylaxis and traveler's diarrhea affected most of the short-term travelers (Table 2). These results were likely due to the characteristics of traveler's diarrhea, such as the short incubation period (<=14 days), the duration of illness (4 to 5 days) and low incidence after 14 days of travel (12,13), and the necessity of early consultation in post-rabies prophylaxis. On the other hand, two patients with giardiasis were seen in the long-term group, and they were admitted 11 and 25 days after their return to Japan. This was likely due to the long incubation period of giardiasis, which is 1 to 3 weeks (14). Travel-related diseases with a long incubation period should not be overlooked.

According to our results and those of previous reports (6,7), the prevention of post-exposure rabies prophylaxis and traveler's diarrhea is necessary for both Japanese and international travelers. Although rabies has not been considered a problem for a long time in Japan, two post-travel Japanese patients died from rabies after a trip to the Philippines in 2006 (15,16). Thereafter, a domestic rabies vaccine for pre-exposure has been in great demand and in short supply. Some Japanese travel clinics are importing

rabies vaccines (e.g., Rabipur® (Novartis, Switzerland) and Verorab™ (Sanofi Pasteur, France)), however, these vaccines have not been officially approved in Japan for pre-exposure from trips abroad and are only used for clients who request them. Thus, our findings were likely the result that most of our patients who had post-exposure rabies prophylaxis did not receive pre-exposure vaccinations. Moreover, post-exposure rabies vaccines at day 0 were administered for only nine patients (56%). We should not be limited to pre-exposure vaccinations in pre-travel consultation. We should explain the dangerous nature of rabies, provide advice regarding the avoidance of contacts with animals and the danger posed by animals other than dogs, and offer speedy post-exposure vaccinations.

According to a previous report (17), pre-travel consultation contributes to preventing the need for post-exposure rabies prophylaxis. On the other hand, the role of pre-travel consultation for traveler's diarrhea is limited. The paradoxical reason(s) for traveler's diarrhea is unclear, although Schlagenhauf et al. (17) suggested that this analysis may be biased because the analysis had not included the asymptomatic post-travelers and pre-travel consultations tended to be for high-risk travelers. If more low-risk pre-travel clients visit the travel clinics, then the positive efficacy of consultation may become more apparent. The Infectious Diseases Society of America guideline for travel medicine recommends education concerning food and liquid hygiene in order to prevent traveler's diarrhea (18). Avoiding contaminated food and water and choosing restaurants with a good reputation is advised during pre-travel consultation. Probiotics and cholera vaccine are also known to be preventive tools for traveler's diarrhea (19,20). Information supporting oral rehydration salts for the self-treatment of risky pre-travel clients should also be provided.

There are some limitations associated with this study. First, our study had fewer participants than the urban studies. Second, since this was a retrospective study, some data were missing. To resolve these problems, we will continue to accumulate the data of our patients for a prospective analysis.

In conclusion, most of our Japanese post-travel patients were young, short-term travelers to Asian countries, who did not receive any pre-travel consultation. There were fewer patients with tropical diseases than the previously reported urban studies; however, post-exposure rabies prophylaxis and traveler's diarrhea were common. Post-exposure rabies prophylaxis, in particular, could be avoided to some extent by pre-travel consultations. We therefore recommend pre-travel consultations for both long- and short-term travelers.

Conflicts of Interest

None.

References

1. Japan Tourism Agency. Number of Inbound and Outbound Travelers [Internet]. [Accessed 2015 May 10]. Available from: http://www.mlit.go.jp/kankocho/en/siryou/toukei/in_out.html
2. Japan Association of Travel Agents. Destination Countries for Japanese travelers [Internet]. [Accessed 2015 May 10]. Available from: http://www.jata-net.or.jp/data/stats/2013/05.html (in Japanese).
3. Basnyat B, Pokhrel G, Cohen Y. The Japanese need travel vaccinations. J Travel Med 7:37, 2000.

4. Thapa R, Banskota N, Pokharel J, Subedi BH, Basnyat B. Another typhoid patient from Japan. J Travel Med 17:199-200, 2010.
5. Fukuoka Airport. Regulatory Scheduled Flights [Internet]. [Accessed 2015 May 10]. Available from: http://www.fuk-ab.co.jp/english/network_int.html
6. Mizuno Y, Kudo K. Travel-related health problems in Japanese travelers. Travel Med Infect Dis 7:296-300, 2009.
7. Shirano M, Kameda K, Goto T. Investigation of hospitalized post-travelers with fever and/or diarrhea in Osaka City General Hospital. Journal of Japanese Society of Travel and Health 6:8-10, 2012 (in Japanese).
8. Haneda Airport official. List of Cities [Internet]. [Accessed 2015 May 10]. Available from: http://www.haneda-airport.jp/inter/en/flight/city_list.html
9. Kansai International Airport. International Flight Network（2015 Summer）[Internet]. [Accessed 2015 May 10]. Available from: http://www.kansai-airport.or.jp/en/flight/flight_nw/pdf/nw_int.pdf
10. Narita International Airport. Flight Information [Internet]. [Accessed 2015 May 10]. Available from: http://www.narita-airport.or.jp/ais/flightall/e_inter_dep.html
11. Leder K, Black J, O'Brien D, et al. Malaria in travelers: a review of the GeoSentinel surveillance network. Clin Infect Dis 39:1104-1112, 2004.
12. Steffen R, Hill DR, DuPont HL. Traveler's Diarrhea: A Clinical Review. JAMA 313:71-80, 2015.
13. Angst F, Steffen R. Update on the Epidemiology of Traveler's Diarrhea in East Africa. J Travel Med 4:118-120, 1997.
14. Gardner TB, Hill DR. Treatment of giardiasis. Clin Microbiol Rev 14:114–128, 2001.

15. Yamamoto S, Iwasaki C, Oono H, Ninomiya K, Matsumura T. The first imported case of rabies into Japan in 36 years: a forgotten life-threatening disease. J Travel Med 15:372-374, 2008.
16. Takahashi H, Sagara H, Fujita S, et al. An imported rabies case for the first time in 36 years in Yokohama. Infectious Agents Surveillance Report 28:64-65, 2007 (in Japanese).
17. Schlagenhauf P, Weld L, Goorhuis A, et al. Travel-associated infection presenting in Europe (2008–12): an analysis of EuroTravNet longitudinal, surveillance data, and evaluation of the effect of the pre-travel consultation. Lancet Infect Dis 15:55-64, 2015.
18. Hill DR, Ericsson CD, Pearson RD, et al. The practice of travel medicine guidelines by the Infectious Diseases Society of America. Clin Infect Dis 43:1499-1539, 2006.
19. McFarland L V. Meta-analysis of probiotics for the prevention of traveler's diarrhea. Travel Med Infect Dis 5:97-105, 2007.
20. López-Gigosos R, Campins M, Calvo MJ, et al. Effectiveness of the WC/rBS oral cholera vaccine in the prevention of traveler's diarrhea: a prospective cohort study. Hum Vaccin Immunother 9:692-698, 2013.

Table 1. The characteristics of the Japanese post-travel patients

	(n=55)	
		(%)
Age, mean ± SD (year)	37.3 ± 16.3	
Sex (male)	36	(65)
Duration of travel (days)	3-1580	
<= 14 days	34	(62)
> 14 days	17	(31)
(Not available)	4	(7)
Purpose of travel		
Leisure	13	(24)
Business	16	(29)
Education	5	(9)
Volunteer	4	(7)
Accompanied family	2	(4)
VFRs	5	(9)
(Not available)	10	(18)
With pre-travel consultation		
Yes	14	(25)
No	19	(35)
(Not available)	22	(40)
Interval between travel return and admission (days)	0-62	
< 10 days	36	(65)
>= 10 days	9	(16)
(Not available)	10	(18)

SD: standard deviation, VFRs: visiting friends and relatives

Table 2. The diagnoses and destinations of Japanese post-travel patients.

Diagnosis	No. of patients (n=55)	Southeast Asia[a] (n=30)	South Asia[b] (n=8)	East Asia[c] (n=3)	Middle-east[d] (n=3)	Europe[e] (n=1)	Africa[f] (n=7)	North America[g] (n=1)	Central America[h] (n=3)	Oceania[i] (n=1)
Post-exposure rabies prophylaxis	16	11	2	1	1	0	0	0	1	0
Traveler's diarrhea	15	8	3	1	1	0	2	0	0	0
Upper respiratory infection	7	4	1[1)]	0	1[1)]	0	2	0	0	0
Fever (unknown origins)	7	4	0	1	0	1	0	0	1	0
Giardiasis	2	1	1	0	0	0	0	0	0	0
Dengue fever	2	1	1	0	0	0	0	0	0	0
Malaria (*Plasmodium falciparum*)	2	0	0	0	0	0	2	0	0	0
Bronchitis	1	0	0	0	0	0	0	0	0	1
Cellulitis	1	0	0	0	0	0	0	1[2)]	1[2)]	0
Influenza	1	1	0	0	0	0	0	0	0	0
Rash (unknown origin)	1	0	0	0	0	0	1	0	0	0

1) One of the patients of upper respiratory tract infection travel both of south asia and middle-east, 2) A patient of cellulitis travel central and north america, a. the Philippines: 10 cases, Thailand: 10 cases, Burma: 3 cases, Indonesia: 3 caes, Vietnam: 2 cases, Cambodia: 1 case, Malaysia: 1 case, Singapore: 1 case, b. India: 7 cases, Nepal: 2 cases, Bangladesh: 1 case, c. China: 3 cases, d. Turkey: 3 cases, Armenia: 1 case, Iran: 1 case, Siria: 1 case, e. Spain: 1 case, f. Liberia: 2 case, Cote d'Ivoire: 1 case, Burkina Faso: 1 case, Ghana: 1 case, Kenia: 1 case, Uganda: 1 case, g. United States: 1 case, h. Mexico: 3 cases, Jamaica: 1 case, Cayman islands: 1 case, i. Solomon islands: 1 case

Table 3. The comparison of characteristics between long-term post-travelers and short-term post-travelers

	Long-term post-travelers (n = 17)	(%)	Short-term post-travelers (n = 34)	(%)	*p* value	
Age, mean ± SD (year)	34.2 ± 15.6	−	39.3 ± 14.6	−	0.27	1)
Sex (male)	12/17	(71)	21/34	(62)	0.76	2)
Purpose of travel [a]						
Leisure	3/15	(20)	10/29	(34)	0.49	2)
Business	7/15	(47)	9/29	(31)	0.34	2)
Education	1/15	(7)	4/29	(14)	0.65	2)
Volunteer	2/15	(13)	2/29	(7)	0.60	2)
accompanied family	1/15	(7)	1/29	(3)	1.00	2)
VFRs	1/15	(7)	3/29	(10)	1.00	2)
With pre-travel consultation [b]	11/14	(79)	2/18	(11)	0.0002	2)
Interval between travel return and admission >= 10 days	4/12	(33)	5/32	(16)	0.23	2)
Diagnosis						
Post-exposure rabies prophylaxis	2/17	(12)	10/34	(29)	0.29	2)
Traveler's diarrhea	1/17	(6)	14/34	(41)	0.01	2)

1) Student’s t-test, 2) Fisher’s exact test, a: data of 7 participants were not available. b: data of 19 participants were not available. c: data of 7 participants were not available. SD: standard deviation, VFRs: visiting friends and relatives