ORIGINAL RESEARCH

International Travelers' Sociodemographic, Health, and Travel Characteristics: An Italian Study

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Abstract

BACKGROUND Approximately the 8% of travelers requires medical care, with the diagnosis of a vaccine-preventable disease. The aim of our study was to analyze the socio-demographic, health and travel characteristics of the Italian international travelers.

METHODS We conducted a cross sectional study from January 2015 to June 2016, at the Travel Medicine Clinic of Siena, asking the doctor to interview patients who attended the Clinic, recording socio-demographic and travel information, malaria prophylaxis, vaccinations. The data were organized in a database and processed by software Stata®.

RESULTS We collected 419 questionnaires. Patients chose 71 countries for their travels; the favorite destinations were: India (6.31%), Thailand (6.31%), and Brazil (5.10%). The mean length of stay was 36.17 days. Italians, students, and freelancers tended to stay abroad for a longer time (mean: 36.4 days, 59.87 days and 64.16 days respectively). 33.17% of our sample used drugs for malaria chemoprophylaxis: 71.9% of them used Atovaquone/Proguanil (Malarone®), 26.6% used Mefloquine (Lariam®), 1.5% other drugs. The vaccinations that travelers mostly got in our study were to prevent hepatitis A (n = 264), the typhoid fever (n = 187), the Tetanus + Diphtheria + Pertussis (n = 165), the Yellow fever (n = 118) and the cholera (n = 78).

Twenty-eight (6.68%) refused some recommended vaccinations. The vaccines mostly refused were for Typhoid fever (n = 20), hepatitis a (n = 9), and cholera (n = 9).

CONCLUSION Our results demonstrated that Italian international travelers are at-risk because of their poor vaccinations adherence. This implies that pre-travel counseling is fundamental to increase the knowledge of the risks and the compliance of future travelers.

KEY WORDS Travel medicine, Italy, characteristics, vaccination

INTRODUCTION

The reduction of the cost of flights has given many people the opportunity to visit distant countries, especially developing countries, for tourism, business, study, or missionary and service activities. Only 36 hours are necessary to go around the world by plane: a time considerably shorter than the incubation period of the infectious diseases that can be contracted in various parts of the world.[1,2] So, more than 700 million passengers who travel each year have a significant risk of contracting infectious diseases and of becoming a vehicle of infection for other people when they come back home.[3]

This globalization and the consequent increasing risk of travel-related illnesses make health care

professionals fundamental to advise travelers about these potential risks. Travel medicine is a multidisciplinary specialty that requires experts in travel-related illnesses, as well as up-to-date knowledge of the global epidemiology of infectious and noninfectious health risks, health regulations and immunization requirements in various countries, and the changing patterns of drug-resistant infections.[4]

In 2015, approximately 8.2% of the Italian population was foreign born.[5] Members of this immigrant population who move to visit friends or relatives in lower-income countries (VFR travelers) are at a higher risk of travel-related infectious diseases than the general population of international travelers.[6] Several studies have found that the majority of travel-associated malaria and typhoid fever cases in the United States in 1999-2006 occurred in VFR travelers.[7] This kind of travel, particularly to South-Central Asia, was an independent risk factor for enteric fever in this population. Other infectious diseases, including hepatitis A, measles, tuberculosis, and others, are also more common in VFR travelers.[6,8]

Among all efficient public health interventions, vaccines top the list, saving millions of lives each year. They contributed to the decline of the mortality and morbidity of several infectious diseases.[9] However, approximately 8% of travelers who move to developing countries require medical care during or after travel, with a diagnosis of a vaccine-preventable disease.[10]

Several studies have examined the incidence of diarrhea in travelers directed to single destinations,[11,12] the incidence of malaria in returned travelers,[13,14] the incidence of Japanese encephalitis,[15] and the incidence of meningococcal disease and other infectious diseases.[1,2,8,16,17] The aim of our study was to analyze the main characteristics of the Italian international travelers, focusing also on some travel aspects, such as the reasons of their travel, the length of stay, malaria chemoprophylaxis, and vaccinations they decided to do or to refuse.

METHODS

We conducted a cross-sectional study in the period January 2015−June 2016, at the Travel Medicine Clinic of the Local Health Unit of Siena, Italy. We asked the doctor on duty to interview all the patients who attended the clinic. All patients gave informed consent before being included in the study. All procedures were in accordance with the 1964 Helsinki Declaration and its later amendments. The study was approved by the Research Ethics Committee.

Through the questionnaire, we collected sociodemographic information (country of origin, age, sex, job) and other information such as travel destination, reason of the travel, date/month of departure, and length of stay. The physician recorded also the malaria prophylaxis and the vaccinations that they got or refused.

From the answer percentages, means and standard deviation were calculated. Shapiro-Wilk test was performed to assess the non-normality of the variables "age" and "length of stay." The relationship of sociodemographic variables with length of stay was assessed through the Mann- Whitney test for dichotomous variables and through the Kruskal-Wallis test for variables with more than 2 categories. Odds ratios were calculated to assess the relationship between vaccination refusals and the sociodemographic variables. The data were processed by software Stata SE, Version 12.1 (StataCorp, College Station, TX). The level of significance was set at $P < .05$.[18-22]

RESULTS

From January 2015 to June 2016 we collected 419 questionnaires. The sociodemographic characteristics of our samples are shown in Table 1.

Participants chose 71 countries for their travels; the favorite destinations were India (6.31%),

Table 1. Sociodemographic Characteristics of Our Sample

Gender	
Males	50.12%
Females	49.88%
Country of origin	
Italy	84.01%
Abroad	15.99%
Age	Mean 36.77 years (SD 15.8)
Job	
Student	18.23%
Employee	19.06%
Retired	5.52%
Freelance	10.50%
Workman	8.84%
Doctors	9.67%
Teachers/professors	6.35%
Unemployed	2.49%
Engineer/architect	4.42%
Salesman	1.38%
Geologist	1.66%
Lawyer/judge	1.66%
Other	10.22%

Thailand (6.31%), Brazil (5.10%), South Africa (4.85%), Vietnam (3.88%), Ethiopia (3.64%), Peru (3.40%), Congo (3.40%), Madagascar (3.16%), Sri Lanka (3.16%), and Tanzania (3.16%).

The mean length of stay was 36.17 days (standard deviation [SD] 73.33), and the main reasons for travel were tourism (56.54%), visiting friends and relatives (14.07%), business/work (15.8%), international cooperation (2.47%), study (5.68%), religious reasons (2.22%), other (3.21%).

Travelers chose to leave principally in February (10.76%), July (10.76%), and August (10.76%). There was a statistically significant difference in the length of stay based on the country of origin ($P < .01$), job ($P < .01$), chosen destination ($P < .01$), and reason for travel ($P < .01$). Italians, students, and freelancers tended to stay abroad for longer times (mean: 36.4 days, 59.87 days, and 64.16 days, respectively). Study as a reason for travel notably increased length of stay (mean: 110.33 days). Approximately 33.17% of our sample used drugs for malaria chemoprophylaxis: 71.9% of them used atovaquone/proguanil (Malarone), 26.6% used mefloquine (Lariam), and 1.5% other drugs.

Twenty-eight (6.68%) refused some recommended vaccinations. Table 2 shows the vaccinations that travelers decided to get and to refuse.

Men tended to refuse vaccinations less than women ($P < .05$; odds ratio [OR]: 0.44). There was no statistically significant difference between Italians and foreigners in vaccination refusals.

DISCUSSION

There are several similarities between our study and a study previously conducted in a pretravel clinic in Marseille.[23] The mean age of our sample was 36.77 years (36.6 years in Marseille); the predominance of tourists in our survey was 56.54% (60.3% in Marseille). The percentage of men is similar (49.6% in Marseille).

Travelers who were born abroad represented an important percentage (15.99%) of our sample, if we consider that in Italy (according to a population census carried out in 2011) there are almost 5 million foreign citizens, representing only the 8.1% of resident population.[5]

Students (18.23%), employees (19.06%), and freelancers (10.50%) are the most represented categories of workers of our study; in contrast, in the Marseille study employees represented 13.5% of the sample, followed by retired persons at 14.0%; students or unemployed persons represented

Table 2. Vaccinations That Travelers Decided to Carry Out and to Refuse

Vaccination	Carried Out	Refused[*]
Tetanus	3 (0.72%)	
Tetanus + diphtheria	19 (4.53%)	
Tetanus + diphtheria + pertussis	165 (39.38%)	5 (10.4%)
Hepatitis B	20 (4.77%)	
Hepatitis A	264 (63.01%)	9 (18.8%)
Meningococcal	48 (11.46%)	2 (4.2%)
Yellow fever	118 (28.16%)	1 (2.1%)
Polio	91 (21.72%)	2 (4.2%)
Typhoid fever	187 (44.63%)	20 (41.7%)
Cholera	78 (18.62%)	9 (18.8%)
Tickborne encephalitis	—	
Rubella + measles + mumps	3 (0.72%)	
Haemophilus influenzae type b (Hib)	—	
Pneumococcal	—	
Seasonal influenza (Flu)	—	
Human papillomavirus (HPV)	—	
Chickenpox	2 (0.48%)	
Japanese encephalitis	1 (0.24%)	
Rabies	1 (0.24%)	

* Percentages are calculated based on all the refused vaccination (n = 48).

together 15.2% of all the travelers enrolled in the study.

In the French study the favorite destinations were Senegal (21.6%), Kenya (6.1%), Brazil (5.3%), Burkina Faso (5.1%), French Guyana (5.0%), Mali (4.8%), Comoros (4.2%), Cote d'Ivoire (4.0%), India (3.1%), and Tanzania (2.8%).[23]

Our sample seems to have chosen alternative destinations, especially if compared with other Italian available data, which indicated that Spain was the most attractive country for long-term holidays, followed by France, and that Morocco and the United States were the most visited countries for tourism (6% and 3.2%, respectively), and China for business (4.6%).[24] These data are in line with those provided by the World Tourism Organization[25]: France has 83.7 million tourists per year, United States 74.8 million, Spain 65.0 million, China 55.6 million, Italy 48.6 million, Turkey 39.8 million, Germany 33.0 million, United Kingdom 32.6 million, Russia 29.8 million, and Mexico 29.1 million.

The mean length of stay was 36.17 days (SD 73.33), slightly lower than the study conducted in Marseille, where the mean travel duration was 5.6 weeks (range: 0.1-52 weeks).[23] Differences can be observed also in the reasons for travel: In the French

study, these were tourism (60.3%), business (17.3%), VFR (13.5%), international cooperation (5.5%), and study (2.2%).[23]

Travelers chose to leave principally in February (10.76%), July (10.76%), and August (10.76%); this is partially in line with the findings of the French study, which reported a 1.4-fold increase in the number of visits in June and a 1.2-fold increase in July because of departures for summer scholar vacations.

In our study, only 33.17% used drugs for malaria chemoprophylaxis: 71.9% used atovaquone/proguanil (Malarone), 26.6% used mefloquine (Lariam), and 1.5% other drugs. These data are quite different from the findings of Aubry et al,[23] where 70.7% received malaria chemoprophylaxis: atovaquone-proguanil (50.6%), doxycycline (37.2%), and mefloquine (6.7%). This probably is due to the different choice in travel destinations.

The vaccinations that travelers mostly got in our study were to prevent hepatitis A (n = 264); typhoid fever (n = 187); tetanus, diphtheria, and pertussis (n = 165); yellow fever (n = 118); and cholera (n = 78). Verma et al[26] listed in their study the recommended vaccines for international travelers to India, which is the most chosen destination of our travelers.

Adult diphtheria and tetanus vaccine single booster is recommended if none was performed in the previous 10 years. Side effects include mild pain at injection site and fever.

Hepatitis A vaccine has an efficacy that is almost 100% for up to 1 year; a booster after 12 months provides at least a further 20 years of protection.

Typhoid fever is a life-threatening illness. Typhoid vaccine is recommended for all travelers to India, even if visiting only urban areas. Tablets (3 doses on alternate days) are available; however, injection is usually recommended because of its fewer side effects[27]; protection lasts about 5-7 years, and a booster is recommended every 5 years in people traveling to endemic regions.[28,29]

Vaccine for yellow fever should not be given to people younger than 9 months, pregnant women, immunocompromised people, or those allergic to eggs. It should not be given to those with a history of thymus disease or thymectomy. Vaccine is not recommended or required for travelers arriving directly from North America, Europe, Australia, or other Asian countries but is necessary for a lot of travel to African countries.[26]

The killed whole-cell *Vibrio cholerae* O1 in combination with a recombinant B subunit of cholera toxin (WC/rBS) cholera vaccine (Dukoral) has been reported to induce cross-protection against *Escherichia coli* because of the B subunit of the cholera toxin. The results suggest that WC/rBS vaccination of travelers to high-risk areas is associated with an absolute reduction of 28% in the risk of traveler's diarrhea.[30]

In the study conducted by Aubry et al,[23] the percentages of other vaccinations were higher, especially for hepatitis B virus (4.1%), typhoid fever (37.1%), hepatitis A virus (41.5%), Japanese encephalitis (0.6%), and rabies (5.6%).

Japanese encephalitis vaccine is recommended for long term (>1 month) travels to rural areas (especially in Asia) or for travelers who, during short trips, may engage in extensive unprotected outdoor activities in rural areas, especially in the evening.[26]

Rabies is a deadly viral infection. The disease is rare in travelers, but the risk increases with extended travel and animal contact. The vaccine is recommended for travelers spending a lot of time outdoors, travelers at high risk for animal bites (veterinarians and animal handlers), long-term travelers, and expatriates. Dog bites account for most cases of rabies in India, and bites from cats, tigers, camels, and the Indian civet also may transmit rabies. A complete pre-exposure cycle consists of 3 doses injected into the deltoid muscle on days 0, 7, and 21 or 28. Side effects may include pain at the injection site, headache, nausea, abdominal pain, muscle aches, dizziness, and allergic reactions.[31] Travelers to countries where rabies is endemic are prone to the risks of rabies exposures. Most of the incidents happened in Asia and Africa. Thailand, a well-established tourist destination with arrivals of more than 10 million annually, was mentioned as a common site of mammal bites. Pre-exposure rabies vaccination for persons at increased risk is recommended by the World Health Organization (WHO). Education of travelers before they leave is the most effective method to reduce the risk.[32]

Vaccination against meningococcal disease is not a requirement to enter some countries, except for Saudi Arabia, for travelers to Mecca during the annual Hajj. Sub-Saharan Africa is the travel destination with the second highest risk for meningococcal disease after Saudi Arabia. Travelers to the meningitis belt during the dry season should be advised to receive meningococcal vaccine, especially if the prolonged contact with the local population is unavoidable. The recommendation should be extended to the Greater Lake Area, because of recent outbreaks.[17] Despite the high incidence of meningitis in Africa, there are only a few reports of travelers to Africa being affected by meningococcal disease.[33]

Vaccine mostly refused were for typhoid fever (n = 20), hepatitis A (n = 9), and cholera (n = 9). Vaccine hesitancy according to the Strategic Advisory Group of Experts of the WHO is the "delay in acceptance or refusal of vaccines despite availability of vaccine services."[34] Vaccine hesitancy is complex and context specific, varying across geographies and vaccine types. It is influenced by factors such as complacency, convenience, and confidence. Vaccine complacency is known to be present where the risk of vaccine preventable diseases is perceived to be low and where vaccination is not considered essential. It has been observed that vaccine hesitancy is heavily affected by lack of confidence in the vaccine's safety and efficacy as well as fears regarding the reliability and competence of health system. Additionally, the quality of vaccination services and their convenience (eg, physical availability, geographical accessibility, and affordability), as well as the patient's willingness to pay, are factors that affect the decision to be vaccinated or not.[34]

The typhoid vaccine live oral (Ty21a) that we prescribed in our ambulatory is a live attenuated vaccine for oral administration only. The vaccine contains the attenuated strain of *Salmonella typhi* Ty21a. The high refusal rate could be explained with its side effects, which are uncommon but include fever and headache. Less common reactions include nausea, vomiting, diarrhea, and urticarial rash.[28]

Hepatitis A vaccine can have mild side effects such as headache and sore arm, which occur in 5%-10% of people; however, as reported in other studies, the immunization decreases the hepatitis A transmission by limiting the persons carrying hepatitis A virus from endemic countries.[35]

As for cholera vaccine, Peprah et al[36] reported that the reasons for partial and nonacceptance of the vaccination included lack of time and fear of side effects. Other reasons included fear of taking the vaccine alongside other medication or with alcohol. The findings highlight the importance of considering the target populations' perceptions and suggest the need for better communication about the vaccine, its side effects, and interactions with other substances.[36]

Two persons in our sample decided to refuse polio vaccination. It is important to remember that in response to ongoing importations of poliovirus into polio-free countries, on May 5, 2014 the general director of the WHO declared the international spread of polioviruses a public health emergency of international concern. This declaration highlighted how serious WHO considers the threat of polio as a result of the ongoing international spread of polioviruses. WHO announced temporary recommendations to ensure that all travelers departing from polio-infected countries would have received a polio vaccination (oral or injectable polio vaccine) between 4 weeks and 12 months before international travel, providing a proof of their vaccination.[37] An important and reassuring aspect of our research is that refusals derived especially from travelers who went abroad for touristic reasons (81.48% of all refusals), followed by international cooperation (7.41%), religion (3.70%), work (3.70%), and other reasons (3.70%). Moreover, the mean length of stay abroad of these travelers was very short (17.6 days), and the chosen destination were generally bigger cities or resorts; this reduces the risk of acquiring infectious diseases.

CONCLUSIONS

Our results found that Italian international travelers who attended our Travel Medicine Clinic, although not representative of the entire traveling population, could be considered a good sample. Our survey provided information about the travel destinations, travel duration, and pretravel medical care (especially vaccinations and malaria prophylaxis) of an epidemiologically significant population and could facilitate the targeting of strategies for the reduction of risk in this group. These results could assist in limiting the spread of infections related to international travels. We found that a significant proportion of travelers are at risk because of their poor vaccinations adherence. This implies that pretravel counseling is fundamental to increase the knowledge of these risks and the compliance of future travelers.

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