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Health Risks of Business Travel: Innovation towards Travel Health Risk Management

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Abstract

The aim of this paper is to review the literature describing the travel risk assessment and to introduce a new online tool, the Travel Risk Estimator for Business Traveller, (TREB).

Travel risk assessment is an important part of the travel health practice; it includes evaluating both the risks of destination and health of the individual travelling to that destination. Risk assessment mainly determines what health and safety advice and interventions are given within the relevant prevailing travel health guidelines. The linkage between global travel and business is becoming stronger and travel related disease awareness has increased. With increased international interest in traveller' health, there is a demand to simplify and facilitate the travel health risk assessment.

The authors have developed a prototype of an online tool, the TREB calculator. It is envisioned as a tool, which allows both traveller and health care professional to have a rough estimation of the risk of a trip in a simple way. TREB is a new tool first introduced in the fourth quarter of 2013 by the Qatar Petroleum Occupational Health Services in during a presentation done by the authors in the Second QP Occupational Health conference in November 2013. TREB could be a helpful and easy to use tool for both individual traveller and clinicians to quantify travel risk. It provides rough estimation of risk and advice to traveller, nevertheless validity testing and review is required.

Abbreviations: DVT: Deep Vein Thrombosis; IPIECA: International Petroleum Industry Environmental Conservation Association; QP: Qatar Petroleum; TRD: Specific Travel-related Disease; TREB: Travel Risk Estimator for Business Traveller; UNTWO: United Nations World Tourism Organization

Keywords: Travel risk; Online tool; Occupational health; Destination; Calculator; Risk assessment

Introduction

Travel Medicine is the branch dealing with global epidemiology of health risks suggesting preventive measures such as malaria prevention; vaccination and pre-travel counselling to ensure a health risk free travel [1]. American companies have roughly spent $ 225 billion sending their employees on business trips during 2012; according to a report by the US Travel Association [2].

Infectious diseases of both a global and regional nature are becoming more prevalent. The past two decades have seen many re-emerging diseases and unexpected outbreaks of new infectious diseases. Global pandemics have included HIV/AIDS; H1-N1 (swine flu); regional epidemics have included Severe Acute Respiratory Syndrome (SARS); and H5-N1 (avian flu) [3].

In addition; the recent outbreak of corona virus in Saudi Arabia and Ebola in West Africa has added a burden on both business and travel health services worldwide.

The linkage between global travel and business is becoming stronger and travel related disease awareness has increased.

With increased international interest in travellers' health; there is a demand to simplify and facilitate the travel health risk assessment. The authors have developed a prototype of an online tool; the Travel Risk Estimator for Business Travellers; (TREB) calculator. It is envisioned as a tool; which allows both travellers and health care professional to have a rough estimation of the risk of a trip in a simple way.

The aimed of this article is to review the literature describing the travel risk assessment and to introduce a new online tool; the TREB.

Background

According to United Nations World Tourism Organization [1] Traveling worldwide has been in gradual increase through the past few years; 800 million in 2005; 939 million 2010; 980 million in 2011. In the age of globalization; risk of spreading disease arises as major burden on national healthcare resources.

A worldwide pandemic could have a major effect on the global economy; including travel; trade; and financial markets. Providing a prober preventive travel health services by business is essential to minimize a pandemic's impact.

The World Bank cut its growth forecast for East Asia to 5.0%-from 5.8% in 2002-due in part to SARS [4].

International business travel to under-developed and developing countries has increased considerably over the past two decades. Most of these destinations are endemic to a variety of infectious diseases; many of which are associated with considerable morbidity; mortality; or both and the non-immune; un-prepared corporate traveller is at risk [5].

Most large employers such as oil and gas companies have a big number of employees travelling business related trips very frequently far and wide destinations. It is known that the energy industry plays

a dynamic role in many international activities and engagements thereby high rate of business travellers who will benefit largely from travel medicine. It has been estimated that oil and gas employees travel as much as-and possibly more than-their peers in any other single segment of industry [6].

Qatar Petroleum (QP) is not any different from its peers in oil and gas industry. In fact; with a majority of its expatriate employees; travel health related challenges are present mainly during vacations; holidays in addition to employees business travel. QP sends hundreds number of employees in business trips every year.

Occupational health unit in the company has established a travel health advice clinic providing tailored advice for business travellers as well as tourism travellers with their dependants. Advice consists of general health related information in a form of leaflets as well as destination specific advice that includes vaccination and chemoprophylaxis of various illnesses that may encounter a traveller especially to the developed countries.

Travel risk estimator for business travellers TREB is a new tool first introduced in the fourth quarter of 2013 by the authors during the Second QP Occupational Health conference 19-21/11/2013 [7].

Travel risk assessment

Travel risk assessment is an important part of the travel health practice; it includes evaluating both the risks of destination and health of the individual travelling to that destination. Risk assessment mainly determines what health and safety advice and interventions are given within the relevant prevailing travel health guidelines [8].

The assessment usually starts when travellers complete a pre-travel health questionnaire. It typically comprise of destination; duration; purpose of journey; previous travel history; mode of travel and pre-existing medical conditions. The information needs exact itinerary and medical history of the traveller [8].

Common travel related diseases

Travel-related health problems can be categorized in to 2 classes; first non-infectious travel related health risks such as DVT; traumatic injuries; jet lag; psychological distress; personal assault; and excessive sun exposure; etc.

Secondly; the travel related infectious illness can be considered as the Specific Travel-related disease (TRD). Wieten et al. [9] defined relevant TRD as self-reported fever (measured temperature above 38°C); self-reported diarrhea with or without blood (acute: frequent loose stools lasting >1 d; persistent to chronic: frequent loose stools lasting >14 d); infectious dermatological disorders; respiratory problems; and fatigue/overall malaise lasting over 7 days resulting in a physician's consultation. He excluded health problems that did not potentially have an infectious cause from the definition of TRD (e.g. traumatic injuries).

Despite the emphasis on communicable disease in travel medicine; the most common preventable causes of death amongst travellers are accidental injury [10] and heart attacks. About 35% of deaths of Australian travellers abroad were the result of ischemic heart disease [11]. American travellers have comparable pattern of mortality [12].

Other health risks for travellers to developing countries include malaria; hepatitis A; hepatitis B; rabies and travellers' diarrhoea [10]. In Australia; Infectious disease was reported as the cause of death in 2.4% of travellers [11]. For tropical traveller visiting a Swiss travel clinic; the highest risks for travellers are accidents followed by mosquitoes; STIs; malaria; rabies; and epidemic outbreaks [13]. Other authors consider diarrhoea and contaminated food as the most common travel risks [14].

Identify high-risk travellers

Travellers with chronic disease and co-morbidity are at higher risk of developing travel related health problems. A meta-analysis study conducted to suggest ways to identify and advise high-risk patients. Patients with cardiovascular illness or COPD should be advised to avoid any unnecessary exertion while traveling. Detailed instruction should be given to diabetic patients on how to maintain stable glucose levels; to pregnant women on avoiding malarial infection [15].

The most common underlying medical conditions studied included: diabetes mellitus; impaired immunity due to use of immune-suppressing medication; reduced gastric barrier; and HIV infection. We found that travellers with underlying conditions were at increased risk for TRD compared to healthy travellers [9]. After international travel; up to 5% of travellers become ill enough to seek medical attention and 1 in 100; 000 succumbs to travel-related disease [16].

Deep Vein Thrombosis DVT is a condition in which a blood clot or 'thrombus' forms in the deep veins of the legs. DVT is a recognized health issue that affect travellers. Air travel is a mild risk factor for venous thromboembolism; doubling the risk of the disease. When thrombophilia or oral contraceptive use are present. Pregnancy is known to cause thrombophilia and increase the risk of DVT [17].

Other factors considered to increase the risk of DVT are increasing age; prolonged immobility; and oestrogens [18]. Pregnant women also at higher risk of travel related diseases; some travel companies place restrictions on travel in pregnancy. Air travel may carry risk of miscarriage; preterm birth; and thromboembolism. In addition; infectious diseases acquired abroad may increase risks of perinatal morbidity [19].

Destination risk

The TREB Calculates the travel risk according to the country of destination. The destination-based risk assessment will help determine the risks involved in travel to specific locations and guide in the development of contingency plans for all travellers; especially those with chronic conditions [20]. Destination risk estimated according to the WHO country classification risk of both Malaria and Yellow fever [21]; accordant to that; countries sorted into three levels; low; moderate and high. Risk of Malaria and Yellow fever; considered as a proxy to infectious risk in destination; because of the seriousness and prevalence risk of the both disease and the availability of robust information about distribution and epidemiology of both diseases form WHO and other international agencies.

Traditionally; Malaria and yellow fever are the health risks of interest to travel health professionals. Malaria continues to be a significant; life-threatening illness in many parts of the world. For corporate travellers from countries with low endemicity; the risk of infection is considerable. Many corporate travellers are unaware of their risk; unsure of the correct preventative measures; and receive incorrect advice regarding prevention or do not comply with advice they have received [22].

Need for more travel health services

With the increasing number of business travellers in the region and worldwide and increased awareness of global epidemics and outbreaks

are in need for more effective and accessible travel health services. In a sample of travellers departing Sydney and Bangkok airports; only (35%) sought pre-travel advice from a health professional; the majority through general practice. There is a public health need to identify strategies targeting these travel groups [23].

The calculator

This tool calculates the risk according to a variety of parameters including destination; duration of stay; areas to visit such as urban or rural as well as traveller's age and any chronic illnesses that could add extra risk during travel. Score is followed by a comment about the level of risk. This may varies from low to high risk reflecting the level of recommendation to contact the travel health advice clinic. Following risk estimation a form will be filled and send to the clinic by email in order to get the appropriate advice and directives.

The Travel Risk Estimator for business travellers or TREB is a tool developed for healthcare providers and travellers in order to objectively quantify the health risk related to travel of an individual. A mathematical equation to estimate the risk of business travellers using the JavaScript; programming language.

Selection was made based on most common factors that contribute to travel risk and can practically employ in mathematical model and electronic calculator. The TREB is composed of 6 fields; each of which scores a specific level between a 1 and 3 except for the area to visit which has a maximum score of 2. For each field; a score of 1 typically indicates normal status; while a higher score is indicative of higher level of risk. The individual scores from each item are summed in order to calculate a patient's the travel risk score. Score ranges between 6 as minimum score and 17 as maximum. Results are categorized based on scoring into 3 groups: From 6 to 8:low health travel risk; 9-11:moderate risk and 12-17: high risk.

In Singapore a mathematical models developed by Massad [24] to estimate the risk of persons to ac-quire dengue fever when traveling to Singapore. According to the researcher; the Risk calculation will help the travel medicine provider give better evidence-based advice for travellers to dengue endemic countries; however this calculation is intend only for the risk of dengue not a general travel risk estimator.

Specifications

The calculator developed using Java Script language can be accessed through World Wide Web [25].

TREB can be used by any traveller however; it is considered more specific for healthy adults travelling in business trips (purpose of travel). It is designed for air travellers; (mode of travel); as almost all business travellers encountered in our clinic in Qatar are using air travel. It provides rough estimation and still in trial- prototype stage. It should only be used as a guidance tool; it is not a substitute for professional medical advice.

Discussion

Travel Medicine by definition is "the art of selecting the necessary prevention strategy without unnecessary adverse events; cost or inconvenience" [10].

With increased international interest in travellers' health; there is a demand to simplify and facilitate the travel health risk assessment.

The authors have developed a prototype of an online tool; the TREB calculator. It is envisioned as a tool; which allows both travellers and health care professional to estimate the level of health risks prior to travel. This calculator can be most effective intervention without unnecessary cost for those undertaking low risk trips.

Usefulness

Because risk scores such as the TREB score gives an indication of the likely benefits of prevention. They are useful for both the individual traveler and for the clinician in helping to decide whether visiting the clinic prior to travel is required or it would be enough to collect preventive information. However; it should be remembered that these categorizations to 3 risk levels are arbitrary.

TREB can be useful to:

• Improve cost effectiveness of travel health program therefore; only travellers of most need encourage visiting the clinic while low risk travellers can be assisted through email advice.

• Raise awareness of travel health risk by encouraging travellers to access the risk and be more conscious about it.

• Facilitate travel health service reporting and evaluation; by quantifying the travel health risk enable data collection analysis and reporting.

Limitations

There are two main limitations. One; it does not consider the seasonality and geographical related health problems within the destination and the fact that not all common co-morbidities are taken into account.

Second; it provides a rough estimation of the risk; as it is still in the testing beta stage; likely to be reviewed periodically before being finalized. Also it is important to update and validate the mathematical equation of the calculator; it is a prototype online tool; still under development.

Validity testing

• A new tool needs to be valid and reliable. Reliability usually means the stability and repeatability of measures. The nature of the estimator questions is straightforward and clearly stable if repeated with different investigators. For example; when a question asked about age and destination; it clearly that the same answer will be given with repetition. The challenge is to prove the validity of TREB.

• In the context of developing questionnaires; the term criterion validity is used; it means the extent to which items on a questionnaire are actually measuring the real-world states or events that they are intended to measure. This type of internal validity can be assessed by comparing questionnaire responses with objective measures of the states or events to which they refer; validity testing study is on-going.

• A cohort study designed on a sample of business travellers to test the criterion validity by comparing it with a gold standard test for travel health risk; the post-travel doctor consultation. The study will continue over a period of one year ending in October 2015. Expectations are to provide a valid and reliable method of travel risk assessment for clinicians and assist travellers by introducing easy to use tool that can be accessed online before trip. After using the TREB an online health advice can be sent. This will help in saving both time and cost due to elimination of unnecessary visits to the travel clinic.

Conclusion

Travel health services are under increasing demand; challenges require providing new solutions and tools.

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TREB could be a helpful and easy to use tool for both individual traveller and clinicians to quantify travel risk. It provides rough estimation of risk and advice to travellers; nevertheless validity testing and review is required.

Acknowledgements

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