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Dear Captain
Good Day,

The yellow fever virus is transmitted by female mosquitoes and is endemic in tropical areas. In Brazil, the current outbreak relates to sylvatic (jungle) yellow fever. Local correspondents in Brazil, Proinde P&I, have issued a circular detailing the nature of the virus and how to avoid infection.

Typical symptoms appear after three to six days and include fever, muscle pain, intense headaches, shivers, loss of appetite and nausea. It is reported that about 15% of patients progress into a more toxic phase of the infection, which has symptoms such as high fever, jaundice and abdominal pain with vomiting. Half of the infected people who enter the more severe form of the infection die within a couple of weeks.

Vaccination is the only adequate defence against the yellow fever virus. The World Health Organisation (WHO) recommends the yellow fever vaccine for all travellers to Brazil.

Proinde P&I have issued advice on the additional proactive measures that can be taken to reduce exposure to mosquito bites. These include:

- Try to stay indoors in screened or in air‐conditioned rooms with doors and windows closed
- If not in an air‐conditioned room, sleep under permethrin‐treated bed nets
- Wear long‐sleeved shirts and trousers, ideally light‐coloured and permethrin‐treated covering as much of the body as possible
- Use an suitable insect repellent on exposed skin and clothing as directed on the product label
- Be aware of yellow fever symptoms and seek immediate medical care should signs of the infection develop

You are requested to confirm receipt, discuss the contents in the next consolidated meeting on board & keep a copy in the file DA-11 .

Best Regards,
Ali Mohtasham

Proinde

Proinde Circular 14-03-2018: new yellow fever vaccination recommendations for travellers arriving or departing from Brazil

1. Introduction

Brazil is facing a severe outbreak of yellow fever, having experienced a significant upsurge in the number of fatal cases in the last few months and the geographic spread of the disease.

According to preliminary reports released by the Brazilian Ministry of Health last week, between July 2017 and March 2018, the viral infection was confirmed in 846 human cases with 260 deaths in cities within the States of São Paulo, Rio de Janeiro, Minas Gerais and in the Federal District. In the same period last year, 597 cases with 190 fatalities were verified[1].

All confirmed cases of yellow fever virus infection in humans so far this year had the probable place of infection in rural areas with documented epizootics of monkeys.

As the number of cases in areas near densely populated areas has grown, the Secretariat of the World Health Organisation (WHO) determined that the entire State of São Paulo, where the ports of Santos and São Sebastião are located, is to be considered at risk for yellow fever transmission[2]. See the attached map for the WHO's vaccination recommendations in the Americas.

2. Transmission and treatment

The yellow fever virus is a flavivirus transmitted by the infected female of *Aedes*, *Haemagogus* and *Sabethes* mosquitoes. The disease is endemic in tropical areas of Africa, Central America and South America, including some areas of Brazil, notably in the North and Centre-West Regions.

Mosquitoes become infected with the yellow fever virus after biting infected non-human primates (monkeys) and humans. No human-to-human or animal-to-human transmission occurs; the only competent vectors are the mosquitoes.

In Brazil, there are two different epidemiological cycles of transmission, the sylvatic (or jungle) yellow fever, which is the case of the current outbreak, and urban yellow fever, though both forms have basically the same characteristics and consequences.

[1] Release from the Ministry of Health published on 7 Mar 2018 and available at http://portalms.saude.gov.br/saude-de-a-z/febre-amarela-sintomas-transmissao-e-prevencao (Portuguese only)
[2] WHO Information for international travellers dated 16 Jan 2018 and disease outbreak news dated 9 March 2018, available at: http://www.who.int

In the sylvatic yellow fever cycle, monkeys are the primary hosts and the vectors are forest dwelling mosquitoes, mainly *Haemagogus* and *Sabethes*, the most prevalent in Latin America. Humans participate in this cycle as accidental hosts as they enter the forest areas.

In the urban cycle, man is the only host with epidemiological importance and transmission occurs from infected urban vectors, such as the *Aedes aegypti*, which can also transmit other arboviruses currently plaguing the country such as zika, dengue and chikungunya. Since 1942, however, there have been no confirmed cases of urban yellow fever in Brazil.

Typical symptoms of yellow fever tend to appear after an incubation period of three to six days and include moderate fever, muscle pain with prominent backaches, intense headaches, shivers, loss of appetite, nausea or vomiting. About 15% of patients progress into a more toxic phase of the infection, which has symptoms such as high fever, jaundice and abdominal pain with vomiting. Half of the infected people who enter the severer form of the infection die within a couple of weeks. Those who survive generally acquire long-lasting immunity to the disease[3].

There is no specific treatment or medication for the yellow fever virus. Early hospitalisation with adequate supportive care, including rest, intake of plenty fluids, food and administration of standard medicines to manage the symptoms significantly improves survival rates.

Vaccination against yellow fever is safe, affordable and abundantly available. It produces effect after ten days of administration and a single dose provides lifelong protection. It is, in fact, the only effective means of personal protection against the infection.

3. Public health response

Since the end of last year, Brazilian health authorities have intensified immunisation activities throughout the country, with door-to-door vaccination and mass campaigns in large metropolitan centres in the States of São Paulo, Rio de Janeiro and Bahia.

ANVISA[4] offers the complete dosage of yellow fever vaccination to travellers and issues the international certificate, free of charge, through vaccination centres across all major Brazilian cities.

3.1. Travellers arriving in Brazil

Yellow fever is the only transmissible disease for which proof of vaccination or prophylaxis may be required as a condition of entry into a Member State of the WHO International Health Regulations 2005 (IHR 2005).

Currently, Brazil does not require vaccination against yellow fever, except for travellers arriving or departing for Angola and the Democratic Republic of the Congo; though the Ministry of Health recommends vaccination for all persons over nine months old who are going to visit affected areas[5].

[3] WHO International Medical Guide for Ships 2007; WHO Yellow Fever Fact Sheet, updated May 2016
[4] the *Agência Nacional de Vigilância Sanitária* – ANVISA (National Health Surveillance Agency) is the regulatory body of the Brazilian Ministry of Health that is the Port Health Authority (PHA) and the National Focal Point (NFP) for the IHR 2005. ANVISA is responsible, amongst other duties, to enforce compliance with the internal health regulations in ports, airports and ground crossings across Brazil
[5] Travellers should check WHO International travel and health website (http://www.who.int/ith/en/) to check the list of Brazilian cities to which yellow fever vaccination is recommended. The demand for yellow fever vaccination for travellers to or from Angola or the DRC was introduced by way of the Ministry of Health's Resolution RE No. 1,822 of 8 Jul 2016.

3.1. Vessels arriving from Brazilian ports into China

Since January 2018, Chinese quarantine authorities have heightened their health and quarantine controls on vessels and travellers arriving from countries with serious outbreaks of yellow fever, including Brazil[6].

Seafarers arriving from Brazilian ports (except cities within the States of Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas and Sergipe) must produce a valid yellow fever vaccination certificate. Those who do not possess the certificate and are asymptomatic will be submitted to a 6-day observation period, calculated from the date they left the affected areas.

Vessels arriving from yellow fever endemic zones are required to produce mosquito eradication certification, which must be arranged before the vessel leaves the affected area. Vessels calling at Chinese ports without a valid certificate shall observe a minimum distance of 400 metres from the nearest land or vessel before being disinsected and allowed to enter the port.

4. Preventive measures

Vessels visiting Brazilian ports should take proactive measures to avoid mosquito-borne diseases through an efficient and well-documented integrated vector management plan (IVM), including disinsection of the vessel and removal of any stagnant water where mosquitoes may eventually lay their eggs.

Although vaccination is the only adequate defence against the yellow fever virus, there are personal protective measures that must be taken by those who remain on board or come ashore to help reduce exposure to mosquito bites, as follows:

- Try to stay indoors in screened or in air-conditioned rooms with doors and windows closed
- Sleep under permethrin-treated bed nets if not in an air-conditioned room
- Wear long-sleeved shirts and trousers, ideally light-coloured and permethrin-treated covering as much of the body as possible
- Use insect repellent based on DEET[7], IR3535[8] or Icaridin (Picaridin)[9] on exposed skin and clothing as directed on the product label and reapply no more than three times a day
- Be aware of yellow fever symptoms and seek immediate medical care should signs of the infection develop

5. Conclusion

The sharp increase in the number of fatal yellow fever victims in large urban areas in Brazil and the relatively low immunisation coverage achieved by ongoing vaccination campaigns are worrying and suggest a potential rise in the number of people infected with the virus and the spread of the disease to areas where the population is not inoculated.

[6] The announcement of the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ) can be found at http://www.aqsiq.gov.cn/xxgk_13386/jlgg_12538/zjgg/2018/201801/t20180122_511609.htm (Chinese only)
[7] Products containing DEET (chemical name: N,N-Diethyl-meta-toluamide, also called diethyltoluamide or N,N-diethyl-3-methyl-benzamide) include, but are not limited to *Off!, Cutter, Sawyer, Ultrathon, Autan and Repelex!*
[8] Products containing IR3535 or EBAAP ((chemical name: 3-[N-butyl-N-acetyl]-aminopropionic acid, ethyl ester) include, but are not limited to, *Skin So Soft Bug Guard Plus Expedition, SkinSmart, Jonhson Loção Antimosquito* and *Repelente infantil Huggies Turma da Mônica*
[9] Products containing Picaridin (KBR 3023 [Bayrepel] or Icaridin outside the United States (chemical name: 2-(2-hydroxyethyl)-1-piperidinecarboxylic acid 1-methylpropyl ester) include, but are not limited to, *Cutter Advanced, Skin So Soft, Bug Guard Plus, SkinSmart* and *Exposis*

While no proof of vaccination is required to enter Brazil (except for travellers arriving from Angola or the DR Congo) and no travel or trade restriction has been applied on the country to date, we recommend that all seafarers on board vessels calling at any Brazilian port be vaccinated and issued with the corresponding international certificate in conformity with the WHO standards.

For further advice, please refer to our publications "*Mosquito-borne diseases in Brazil – Practical Guidance*" and "*Shipboard sanitary inspection in Brazil – Practical Guidance*" which are available for free download on our website.

Editor: Ricardo Martins

www.proinde.com.br

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

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