TROPICAL DISEASES

SSC 5c Elective report

Belmopan Western Regional Hospital, Belize

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Objective 1: What are the major prevalent tropical diseases in Belize? How do these compare to worldwide patterns?

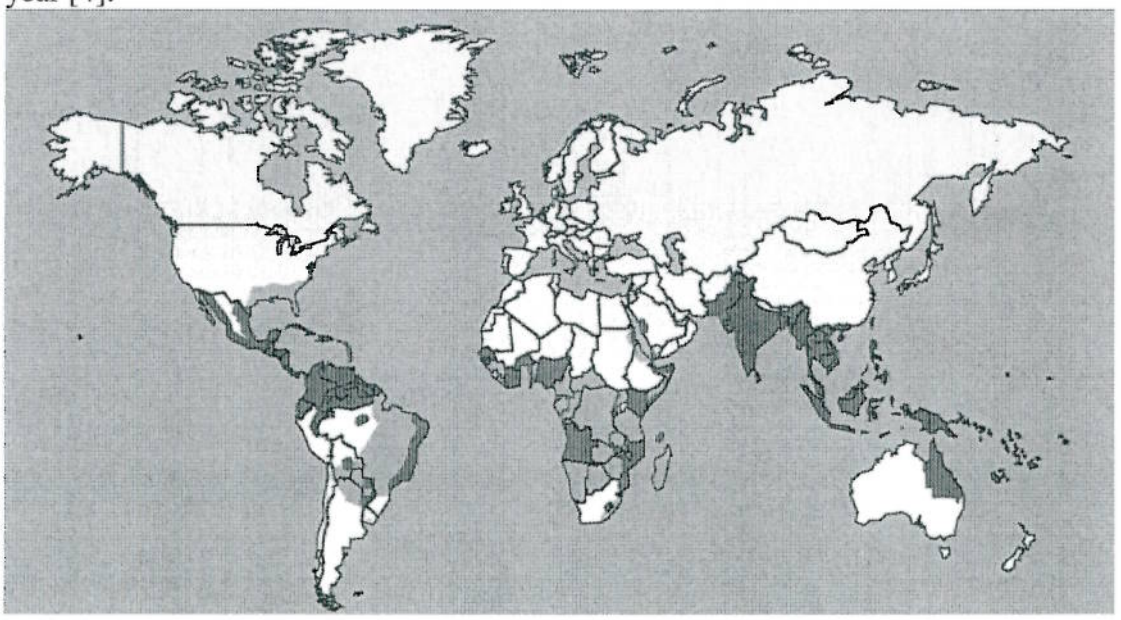
Belize, due to its geographical location and climate is susceptible to a number of diseases that are not native to the UK. The main cause of these diseases is the fact that the annual temperature in Belize never drops low enough to completely kill off its native population of mosquito. These mosquitoes are responsible for the spread of the two major tropical diseases; malaria and dengue fever.

Malaria is the most common tropical disease in Belize although over the last 15 years the number of cases per year has dropped from over 10,441 in 1995 to 1323 cases in 2005 [1]. The majority of these cases were confined to the rural areas to the West of the country where poor sanitation and socio-economic conditions limit effective control of the disease. This number of cases equates to 0.4% of the Belizean population and is argued to be the highest prevalence in Central America

Recent figures for the number of cases of dengue fever are more difficult to ascertain due to the varied nature of the disease. Belize is classed as currently suffering from an epidemic of dengue with the ministry of health quoting the following figures [2]:

Year	Number of confirmed dengue cases
2003	18
2004	42
2005	652
2006	11
2007	137

These are much lower than figures from neighbouring Honduras which estimates to have had 69,745 cases in 2010 [3] and a worldwide rate of 50-100 million cases per year [4].



[5] Geographical representation of the spread of Dengue Fever. Red (dark) shows epidemic dengue with cyan (grey) showing areas where the host mosquito is found.

Objective 2: How are tropical diseases managed in Belize? How does this differ to other tropical countries?

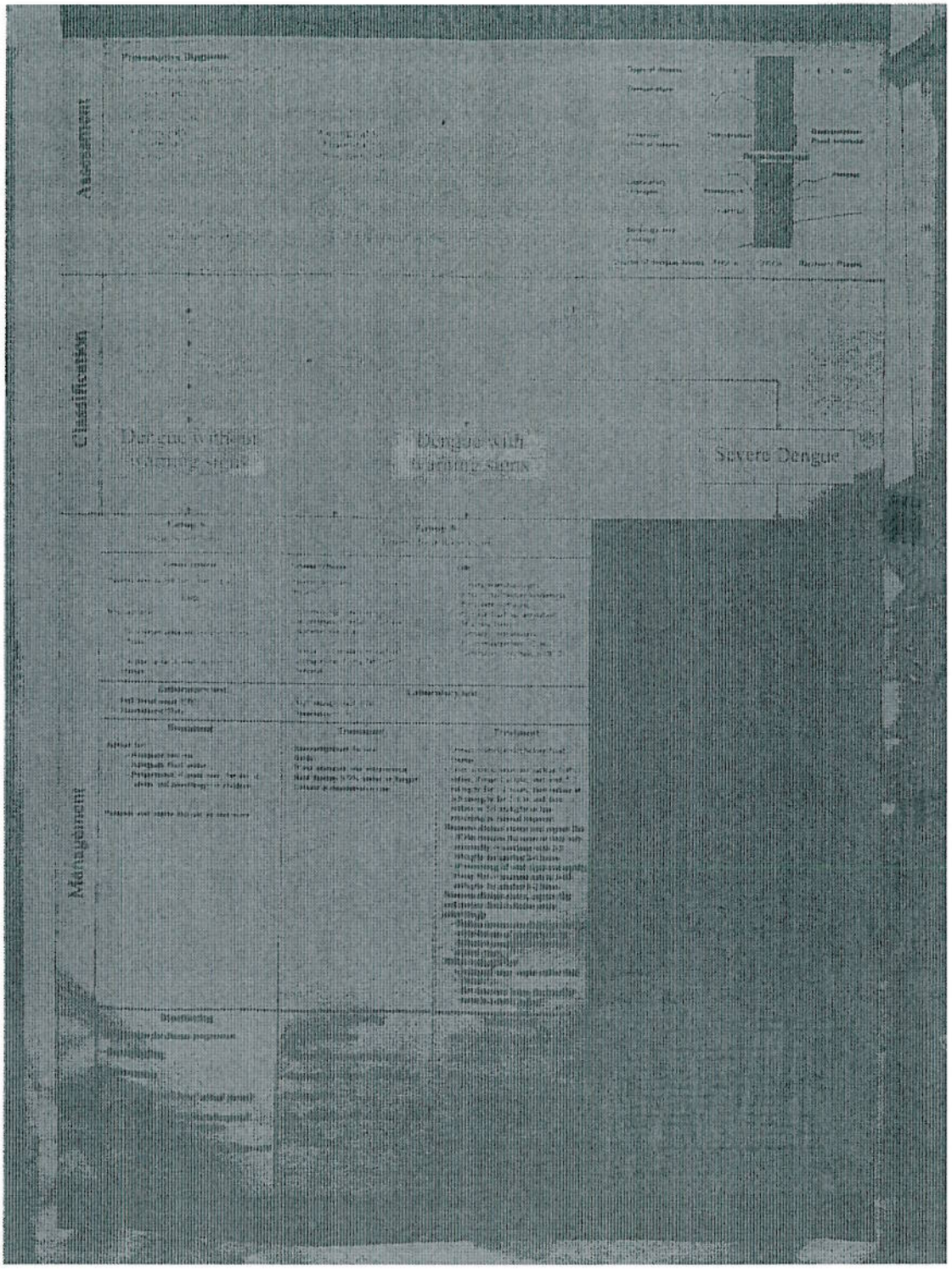
The key to the management of most tropical diseases in Belize is to prevent infection. This is due to the fact that treatment of the disease is far more risky and costly than the simple measures that may be taken to stop the infection in the first place.

Public health information is common in Belize, from the many posters lining the walls of the hospitals, to large public bill-boards and even public health information stalls. An example of one of these posters is shown below.

There is also the widespread use of insecticide sprays which are used in the hope that they will destroy any dormant larvae of disease carrying insects such as the mosquito (malaria and dengue fever) and the "chinche" (Chagas disease)

Travellers to the area are advised to take anti-malarial medication to reduce the risk of contracting and spreading malaria. They are also advised to be up to date with their vaccinations including yellow fever and to try their best to avoid exposing themselves to disease carrying insects [6].

Once someone has contracted a tropical disease there is ample medical support available in Belize, and indeed physicians are made aware to look out for the specific signs so that the correct treatment may be commenced immediately if needed. Below is a poster from a clinic outlining the management of dengue fever.



Objective 3: What is the pathophysiology and treatment of dengue fever?

Dengue fever is an infectious tropical disease that is spread via several species of mosquito. There are 4 types of dengue fever each caused by a specific strain of the dengue RNA virus. When a mosquito feeds on an infected individual (human or non-human primate) the virus will take hold within the cells of the mosquito's gut and

later salivary glands. This mosquito will be infected for life and may pass on the virus via its saliva.

Once a mosquito carrying the dengue virus bites an uninfected human, the virus is passed via the saliva into the dendritic cells in the skin. From here it reproduces and will enter the bloodstream targeting monocytes and macrophages where it may reproduce further. Once at this stage the host body will start an immune response with the production of interferon. It is this that brings on some of the characteristic symptoms.

The symptoms experienced by those infected with dengue fever vary from none to a mild fever, or in those that are more susceptible, or that have been previously exposed to other strains of the virus, can be extremely severe to life-threatening. The characteristic clinical course is a sudden onset fever associated with pain in the joints, muscles, behind the eyes, and a rash. These symptoms will be experienced from 3-14 days post infection in most cases.

In a small proportion of cases (fewer than 5%) the disease may develop into dengue haemorrhagic fever or dengue shock syndrome. Here increased capillary permeability leads to depletion of fluid from the circulation which may lead to organ dysfunction and failure [7, 8].

Diagnosis of dengue fever is made clinically based on the history and characteristic symptoms. Investigations may be carried out to rule out conditions that cause similar symptoms such as malaria or meningococcal disease.

There is no specific treatment for the dengue virus, with management being aimed at treating the symptoms, maintaining adequate hydration, and stabilisation in hospital should the condition become severe enough. Prevention of the spread of the disease is the primary method of controlling the disease. Public health notifications are common in Belize stating how to destroy the habitat of the mosquito and also how to avoid being bitten.

Objective 4: What are the challenges faced by a British medical student practicing abroad in Belize?

We originally chose Belize as our elective destination as it is an English speaking nation that believes in both traditional and Western medicine. On the surface it would appear that there should be no issues in practicing British taught medicine here. However there were a number of factors that made certain situations not so straightforward.

The first major challenge in Belize was in fact the language barrier. Despite the fact that the majority of the locals do speak English, they speak a dialect known as Kriol. This was not a problem when asking questions to the patient as they would understand what had been asked, but would often reply in their native dialect which was often difficult or impossible to understand without a family member or other medical professional present to translate. Spanish is also widely spoken in Belize

which also posed a problem for me as I am not fluent; however there were many Spanish speaking Cuban doctors at the hospital who were happy to help me.

The second major challenge was the lack of resources. Belmopan is the capital of Belize and as a result you would expect the largest and best equipped hospital to be here. However despite its status as a capital, a far greater number of people live in Belize City, which is where the countries largest and best equipped hospital is found. As a combination of this and the fact that the Belizean healthcare system lacks funds means that requesting tests such as an MRI, ultrasound or ABG may take weeks as they need to be done off site. This meant that alternative tests may have had to be sought, and even then, if a major operation is required, most people if they can afford it opt to head abroad where the quality and capacity for care is better.

Word count: 1198

References:

1.) United Nations "Common Country Assessment: Belize" (2006) www.undp.org.bz

2.) "Health statistics of Belize 2003-2007" Epidemiology Unit, Ministry of Health http://www.health.gov.bz/www/attachments/HealthStatsPub03-07.pdf

3.) http://en.wikipedia.org/wiki/Dengue_fever_outbreaks

4.) Whitehorn J, Farrar J (2010). "Dengue". *Br. Med. Bull.* **95**: 161–73. http://www.ncbi.nlm.nih.gov/pubmed/20616106

5.) Gary G. Clark, PhD, entitled "Dengue: An emerging arboviral disease" www.afpmb.org/meetings/TriService2007/Presentations/Monday/OClubMorning/TRIServiceDENemergingJAX2007.ppt

6.) http://wwwnc.cdc.gov/travel/destinations/belize.htm

7.) http://www.who.int/mediacentre/factsheets/fs117/en/

8.) www.ncbi.nlm.nih.gov/pubmedhealth/PMH0002350