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Awareness of Vector Borne Diseases amongst Students of High School and Windsor University School of Medicine (WUSOM), Cayon, St. Kitts, West Indies (WI)

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Abstract

Background: Vector borne diseases (VBD) account for more than 17% of all infectious diseases world-wide. VBD pose a serious public health problem in several parts of the world including the Caribbean region. Awareness of VBD, their means of transmission and knowledge of measures for preventing their spread is essential for the control of these diseases. The present study assesses the awareness of high school and pre-medical students in St. Kitts about the important aspects of vector borne diseases. *Methods:* Demographic data on pre-medical students of WUSOM and form 4 and 5 of a secondary school were collected. Structured questionnaires comprising 18 multiple choice questions were framed to elicit from the participants knowledge on type of vectors of common diseases. *Results:* In general the form 4 and form 5 students, and also the pre-medical students demonstrated a low level of awareness of VBD, their means of transmission and prevention, though form 4 and pr-medical students had a relatively better knowledge of these aspects. *Discussion:* There is urgent need to involve school children in prevention activities through school health programme and by sensitizing principals of all government and private schools.

Keywords: Vector-Borne Diseases; Awareness; High Schoo; Pre-Medical Students; St. Kitts; West Indies.

Introduction

Vector borne diseases (VBD) are infections transmitted amongst humans and between animals and humans by the bite of insects or other arthropods, such as mosquitoes, ticks, triatomine bugs, sandflies, and blackflies. It is estimated that VBD account for more than 17% of all infectious diseases, causing more than 700, 000 deaths annually. Mosquitoes are the best known disease vectors. The diseases transmitted by *Aedes* mosquitoes include yellow fever, dengue, Chikungunya, and Rift Valley fever. Dengue fever, an acute mosquito-transmitted viral disease is the commonest human arboviral infection globally and is responsible for more illness and deaths than any other arboviral disease [1]. *Anopheles* is the major vector of malaria. *Culex* mosquitoes transmit West Nile Virus and Japanese B encephalitis virus. Globally, malaria is the most prevalent vector-borne disease, with over 2.4 billion people around the world at risk of contracting this disease and more than 275 million cases reported every year. Over one million children die of malaria each year. Dengue is the second most important tropical disease (after malaria) with an estimated 390 million infections and 100 million cases annually, a small proportion of these cases progress to severe dengue hemorrhagicfever [2]. 40% of the world's population lives in areas with dengue virus transmission. VBD have emerged as a serious public health problem in several parts of the world including the Caribbean region [2].

Many of the VBD, particularly dengue fever, Japanese Encephalitis (JE) and malaria now occur in epidemic form almost on annual basis causing

considerable morbidity and mortality. Dengue is spreading rapidly to newer areas, with outbreaks occurring more frequently and explosively. The risk factors, which play a key role in the spread and transmission of dengue, include globalization, unplanned and uncontrolled urbanization, developmental activities and poor environmental sanitation. Other important factors are human behavior, water collection in road pits, discarded tyres, and pitchers, widespread travel and human migration, both within the country and across borders [3]. These are causes for much concern and highlight the need to comprehensively address the challenges faced in combating vector-borne diseases nationally and globally.

Awareness of VBD, their means of transmission and preventive measures for their spread is essential for the control of these diseases [3]. The aim of this survey was to assess the awareness of high school and pre-med students in St. Kitts about the important aspects of vector borne diseases.

Methods

Data on the demographic profile of the participants were collected and informed consent was obtained from each participant in the survey. The permission of the Government High School and WUSOM authorities was also obtained before enrolling the participants. Pre-designed proforma with structured questionnaires, comprising 18 multiple choice questions were framed to elicit from the participants knowledge on type of vectors of common disease such as malaria, yellow fever, dengue, filariasis, their modes of transmission and simple preventive measures. The list of questions with correct answers answers in bold is given below.

List of Questionnaire on Awareness of Vector Borne Diseases (Correct Options are in Bold Font).

1. Which is the best definition of vector in connection with vector borne disease?
   a. Vector is an arthropod that carriers and transmits an infectious agent
   b. Vector is an agent that is transmitted vertically from parent to offspring
   c. Vector is an individual who is affected by an organism causing disease and transmits it to another individual
2. Which of the following cannot be considered a disease vector?
   a. Tick
   b. Fleas
   c. Lice
   d. Mosquitoes
   e. Handkerchief

   Is there a vaccine for Dengue currently available?
   a. Yes **b. No**
3. The diseases transmitted by *Aedes aegypti* is:
   a. Dengue
   b. Yellow fever
   c. Filariasis
   d. a & b.
4. Dengue is caused by:
   a **. Virus**
   b. Parasite
   c. Bacteria
5. What is commonest symptom of Dengue?
   a. Flu-like illness with fever
   b. Chills, muscle aches
   c. Skin rash, bleeding
6. Is there a vaccine to protect us from Dengue fever?
   A. Yes
   B. No
7. Over the past few weeks, the number of cases of Dengue Fever in St Kitts and Nevis:
   a. **Has increased**
   b. Has decreased
   c. Is the same
8. What is a public health measure you take to prevent the spread of Dengue?
   a. Proper drainage of water
   b. Proper disposal of waste
   c. Use repellant for mosquitoes
9. People at risk of yellow fever are:
   a. Men working in the forest
   b. Men working in steel factory
   c. Men working in dairy farms
   d. Men who are working in the hospitals
10. Is West Nile virus present in St. Kitts?

a. Yes

b. No

11. West Nile virus is transmitted by which of the following vectors:

a. Mosquitoes

b. Ticks

c. Sand fly

d. Lice

12. The causative agent for Malaria

a. Virus

b. Parasite

c. Bacteria

d. Fungus

13. What is NOT a symptom of malaria?

a. Flulike illness and fever

b. Chills

c. Skin rash and Bleeding

14. Which of the following insects is a vector for the spread of filariasis?

a. Mosquitoes

b. Ticks

c. Sand fly

d. Lice

15. The causative agent for Lyme disease is:

a. Virus

b. Parasite

c. Bacteria

d. Fungus

16. The preventive measure against some of the vector born disease like yellow fever, plague, Japanese encephalitis is:

a. Medication

b. Vaccination

c. Good diet

d. Control of vector

e. Vaccination and control of vector

17. Which of the following countries have completely eradicated vector born disease?

a. St Kitts

b. Canada

c. France

d. Norway

e. **None of the above**

18. The Vector for West Nile virus is:

a. Cattle

b. Snake

c. Bird

d. Jackal

Results

The respondents comprised 156 students including 40 of pre-medical class, 51 of Form 1V, and 65 of Form V1. The age of the respondents varied from 15-21 yrs., and they were almost equally divided between males and females. The correct responses to the questions by form 4 form 5 and premedical students are given in Table 1. As is evident from the data presented in Table 1, form 5 and pre-medical students demonstrated a greater level of awareness about the etiology of dengue, its means of transmission and prevalence, and preventive measures than the form 4 students. The knowledge about the category of persons being at greater risk of acquiring yellow fever was greater in the pre-medical and form 4 students than that in form 5 students.

On other aspects, the knowledge of awareness did not correspond to the level of education amongst the students, as pre-medical students had a relatively low level of awareness about the preventive measures against yellow fever, plague, and Japanese encephalitis, Only a few pre-medical, and form 4 and 5 students knew that no country had yet completely eradicated vector borne diseases.

Discussion

With rapid urbanization, many cities in tropical areas are vulnerable to outbreaks of several vector-borne diseases (VBD) that are especially hazardous for children. Several studies in different countries have concerned assessing awareness of vector-borne diseases among different population groups. VBD have adversely affected the health of the people in the Caribbean region and also impeded overall socioeconomic development. Further the developmental activities in disregard to environmental factors have increased the scope and scale of transmission of these diseases [4]. Several surveys on awareness and attitudes regarding vector-borne diseases have been carried out in India[5-8], Nepal [9], and Tibet

Table 1: No of students (%) in different classes offering correct responses to the questions

Question relating to: (serial no given in parenthesis)	Form 4 (no. of students in class = 51)	Form 5 (no.= 65)	Forms 4 & 5 (no.= 116)	Premedical (no.=40)	Total (no.=156)
Definition of vector (1)	8 (15.7)	14 (21.3)	22 (19)	13 (32.5)	35
Exclusion of handkerchief as a vector (2)	30 (58.8)	39 (60)	69 (59.5)	21 (52.5)	90
Diseases transmitted by *Aedes aegypti* (3)	24 (47.1)	28 (43.1)	52 (44.8)	12 (33.3)	64
Dengue being a viral disease (4)	22 (43.1)	29 (44.6)	51 (44)	16 (40)	67
Correct mention of commonest symptom of dengue (5)	29 (56.9)	44 (67.7)	73 (62.9)	17 (42.5)	90
Availability of vaccine for dengue (6)	22 (43.1)	26 (51)	48 (41.4)	28 (24.1)	76
No. of dengue cases in recent few weeks increased/decreased or static (7)	25 (49)	22 (33.8)	47 (40.5)	24 (60)	118
Preventive measures to stop the spread of dengue in a community (8)	10 (19.6)	36 (55.4)	46 (39.7)	25 (62,5)	71
Category of persons being at risk of yellow fever (9)	31 (60.8)	29 (44.6)	60 (51.7)	15 (37.05	75
West Nile Virus present or absent in St. Kitts (10)	43 (84.3)	54 (83.3)	97 (83.6)	18 (45)	115
Vector for the West Nile Virus (11)	17 (33.3)	22 (33.8)	39 (33.6)	23 (57.5)	62
The causative agent of Malaria (12)	16 (31.4)	14 (21.5)	30 (25.9)	24 (60)	54
Skin rash and bleeding not being a symptom of malaria (13)	5 (9.8)	6 (9.2)	11(9.5)	2 (5)	13
Vector for filariasis (14)	19 (37.3)	19 (29.2)	38 (32.8)	13 (32.5)	51
Causative agent of Lyme disease being a bacterium (15)	8 (15.7)	14 (21.5)	22 ((19)	13 (32.5)	35
Preventive measures against yellow fever, plague, and Japanese encephalitis (16)	24 (47.1)	22 (33.8)	46 (39.7)	19 (16.4)	65
Naming countries having completely eradicated vector born disease (17)	24 (47.1)	30 (46.2)	54 (46.6)	16 (13.8)	70
The natural host of West Nile virus (18)	14 (27.5)	30(46.2)	44 (37.9)	20 (50.0)	64

[10].There are three such studies form the Caribbean region, one is from Jamaica [11], another from French Guiana [12], and the third one from Sint Eustatius [13]. The present study is the first of its kind from St. Kits.These studies point out the need for intensified efforts to create public awareness of vectors and their breeding habitats for control of vector-borne diseases.

It would be good to involve school and university students in preventive measures through school health programmes. These measures include identifying and eliminating mosquito breeding conditions in the vicinity of their institutions, homes, and early seeking of medical attention by those suffering from VBD.

The principals and teachers of both government and private schools should be urged to conduct an intensified special survey with a view to identifying and eliminating prevailing mosquito breeding conditions in its area.

In case any such serious breeding conditions are found during the course of their survey, appropriate action should be taken to prevent mosquito breeding sites.There is also urgent need to modify the behavior of the population to be more aware of vector-borne diseases and their control by mass communication as well as inter-personal approaches.

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Indian Journal of Anatomy	Bi-monthly	8500	8000	664	625
Indian Journal of Ancient Medicine and Yoga	Quarterly	8000	7500	625	586
Indian Journal of Anesthesia and Analgesia	Monthly	7500	7000	586	547
Indian Journal of Biology	Semiannual	5500	5000	430	391
Indian Journal of Cancer Education and Research	Semiannual	9000	8500	703	664
Indian Journal of Communicable Diseases	Semiannual	8500	8000	664	625
Indian Journal of Dental Education	Quarterly	5500	5000	430	391
Indian Journal of Emergency Medicine	Quarterly	12500	12000	977	938
Indian Journal of Forensic Medicine and Pathology	Quarterly	16000	15500	1250	1211
Indian Journal of Forensic Odontology	Semiannual	5500	5000	430	391
Indian Journal of Genetics and Molecular Research	Semiannual	7000	6500	547	508
Indian Journal of Hospital Administration	Semiannual	7000	6500	547	508
Indian Journal of Hospital Infection	Semiannual	12500	12000	938	901
Indian Journal of Law and Human Behavior	Semiannual	6000	5500	469	430
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Indian Journal of Obstetrics and Gynecology	Bi-monthly	9500	9000	742	703
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Indian Journal of Research in Anthropology	Semiannual	12500	12000	977	938
Indian Journal of Surgical Nursing	Triannual	5500	5000	430	391
Indian Journal of Trauma & Emergency Pediatrics	Quarterly	9500	9000	742	703
Indian Journal of Waste Management	Semiannual	9500	8500	742	664
International Journal of Food, Nutrition & Dietetics	Triannual	5500	5000	430	391
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International Journal of Pediatric Nursing	Triannual	5500	5000	430	391
International Journal of Political Science	Semiannual	6000	5500	450	413
International Journal of Practical Nursing	Triannual	5500	5000	430	391
International Physiology	Triannual	7500	7000	586	547
Journal of Animal Feed Science and Technology	Semiannual	78500	78000	6133	6094
Journal of Cardiovascular Medicine and Surgery	Quarterly	10000	9500	781	742
Journal of Forensic Chemistry and Toxicology	Semiannual	9500	9000	742	703
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Journal of Psychiatric Nursing	Triannual	5500	5000	430	391
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Physiotherapy and Occupational Therapy Journal	Quarterly	9000	8500	703	664
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