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Comparison of Dengue and Malaria

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Abstract **Original Research Article**

Background**:* Dengue and Malaria are still among the top causes of morbidity and mortality world-wide. especially in tropical and subtropical areas. Given their overlapping clinical presentations, it's important for doctors to understand the difference between these two conditions. This study intended to evaluate the awareness, disease experience and preventive conduct of medical students regarding Dengue & Malaria and to describe a comprehensive case library-based overview of 2. What do we know about these diseases? their clinical and diagnostic differentiation. Methods: A cross-sectional questionnaire survey was conducted on N = 120 medical students at different levels of training. Demographics, background knowledge (pathogen, vector and season), personal experience with clinical infection (symptomatology, duration of symptoms, hospitalization) and awareness of a possible diagnostic test were included. ***Results: While a majority of students correctly identified the primary vector for Malaria (79% Anopheles) and Dengue (69.6% Aedes), significant knowledge gaps were noted regarding the causative organisms, with only 46.7% correctly identifying Dengue as viral and 53.3% identifying Malaria as protozoal. Common symptoms reported in students who had been diagnosed were Fever (90.2%), Headache (69.6%), and Body pain (68.5%). A case-based differential diagnosis table was constructed, highlighting key discriminating features such as classical fever pattern, presence of rash, and gold-standard diagnostic modalities (NS1 vs. Peripheral Smear). ***Conclusion:*** The study demonstrates a rather poor knowledge base amongst medical students but does emphasize the importance for educational intervention addressed especially to, the etiology, accurate epidemiology. publisher-types in press copyright of this article is retained by the publisher. the clinical presentations and differing criteria for diagnostic testing for Dengue and Malaria. to enhance the differential diagnosis skills of future practitioners.

Keywords: Dengue, Malaria, Differential Diagnosis, Medical Education, Survey, NS1 Antigen, Peripheral Smear.

1. INTRODUCTION

Dengue fever and Malaria are the two most prevalent mosquito-borne diseases worldwide, creating substantial public health problems. In its own infectious diseases database (WHO)

According to the World Health Organization (WHO), approximately half the world's population is at risk for malaria. The incidence of dengue fever has grown violently world-wide in recent decades, with an estimated 100~400 million cases each year at present. Many of the same areas suffer from both diseases, medically their symptoms overlap greatly. Area, particularly in impoverished

From a clinical perspective, both diseases manifest as acute febrile illness, sometimes combined with non-specific symptoms like headache, body pain and fatigue. However, the crux of a correct diagnosis lies in making it promptly and accurately, as the management strategies employed are quite different--antimalarials for Malaria as opposed to supportive treatment, fluid control and constantly vigilant monitoring for Dengue. Delays or mistakes in diagnosis can soon lead to severe complications such as

Dengue Haemorrhagic Fever (DHF) or Cerebral Malaria which mean increased mortality rates. As future frontline healthcare workers, medical students must have a thorough grasp of the subtle clinical and laboratory differences between these two diseases. This type of basic knowledge deficiency results directly in mistakes in diagnosis while on clinical duty--the main reason we conduct this study). Our aim here is threefold:

1) to assess the current knowledge base, clinical experiences, and preventive practices of medical students concerning Dengue and Malaria in a quantitative manner;

2) to examine student experiences during their time at this university as well any gaps that may exist in their knowledge; and

3) to develop a detailed case-based differential diagnosis table to be used as an English-language teaching and clinical reference tool.

2. MATERIALS AND METHODS

2.1 Study Designs and Participants

In a cross-sectional survey, medical students at a university of health sciences were the subjects. Participants responded to an electronic questionnaire, and they did so of their own free will and anonymously. A total of N = 120 responses were collected and worked on. Ethical approval of the study was obtainable from the institute 's review board.

2.2 Data Collection and Analysis

The questionnaire items broadly covered four principal domains:

I **Demographics and Experience:** Age, gender, year of study and history of both Dengue and Malaria diagnosed.

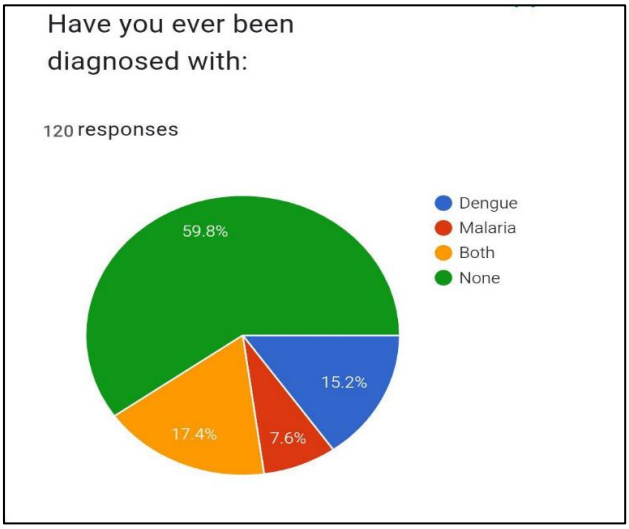
II **Foundational Knowledge:** Causative agent, mode of transmission (Aedes or Anopheles), seasonal incidence.

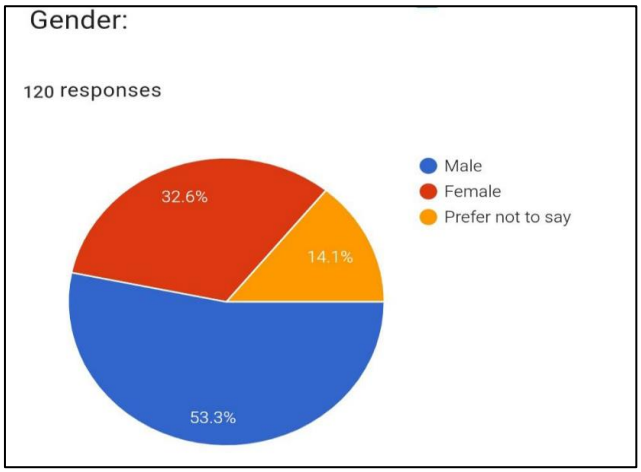
III **Clinical Features and Diagnosis**: Main signs observed, duration of illness, need for hospital admission, and URN confirmation test carried.

IV **Health/incentive Awareness:** Active involvement in classroom programs on prevention, and types of prevention method habitually practised.

All responses were subjected to descriptive statistics, including frequencies and percentiles. The results were then analysed in order to find out what are the areas of mistaken belief or misunderstanding in which further surgery may be necessary.

3. RESULTS





3.1 Demographics and Disease Exposure

The survey included 120 medical students, 53.3% of whom were male and 32.8% female. Students from years 1 and 3 alone accounted for a large proportion of respondents (25% and 28.3%, respectively). A sizeable slice of respondents (40.2%) indicated that they had previously been diagnosed with Dengue (15.2%), Malaria (17.4%) or both (5.4%). This high incidence reflects the clinical relevance of these diseases to our study group.

3.2 Knowledge Assessment: Etiology and Transmission

The survey of underlying knowledge showed serious deficiencies amongst our medical students in recognizing the causative agents (Table). Just 46.7% knew Dengue to be a virus; 34.8%, on the other hand, had this down as a Protozoon. Similarly, for Malaria, only 53.3% thought it caused by a Protozoon, 25% on the other hand chose virus.

By contrast, the main vectors were relatively well understood (at least in name, although some confusion still exists). For Dengue, the Aedes mosquito bite was correctly chosen by 69.6%, but Anopheles by 19.6%. For Malaria 79% went for an Anopheles mosquito bite. Asked about seasonality, 73.9% thought that Summer was associated with a greater number of cases whilst Rainy, which often means most at marrying time for mosquitoes, could be selected by only 14.1% of respondents.

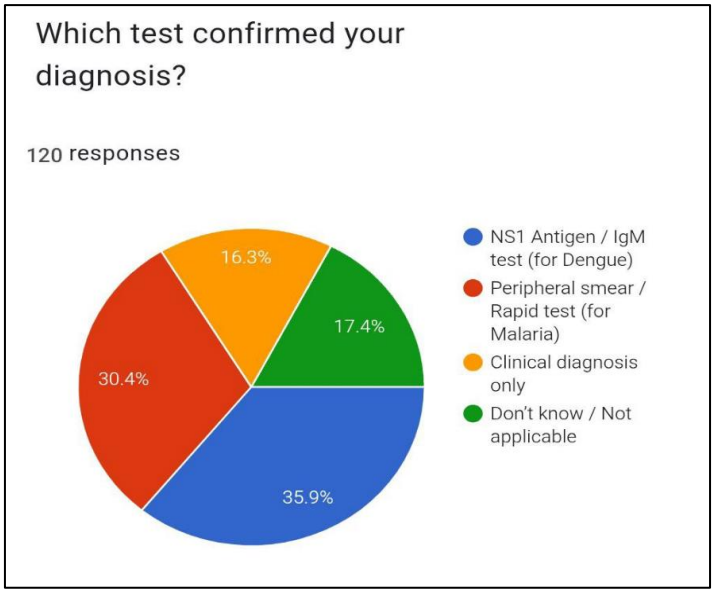
Table 1: Medical Student Knowledge of Causative Organisms (N = 120)

Causative Organism	Dengue (Correct: Virus)	Malaria (Correct: Protozoa)
Virus	46.7%	25.0 %
Bacteria	7.6%	10.9%
Protozoa	34.8%	53.3%
Don't Know	10.9%	10.9%

3.3 Clinical Features and Diagnostic Awareness

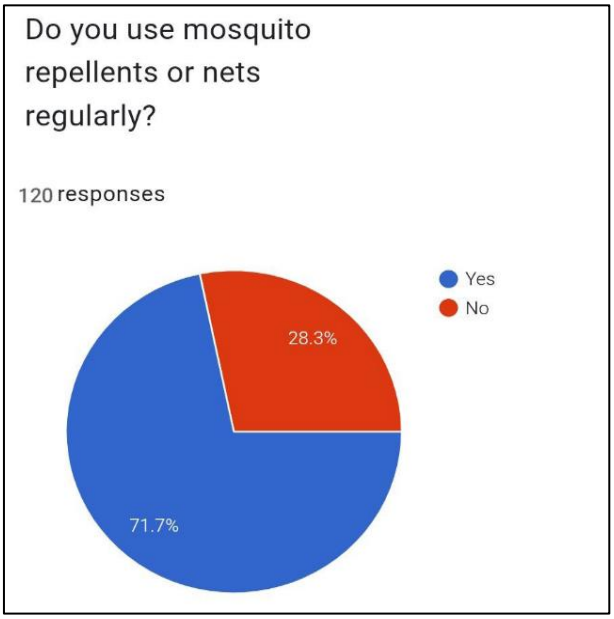
Among 40.2% of students who had received a diagnosis for one of the illnesses in the study, the main reported manifestations were not specific but characteristic of an acute febrile illness: Fever (90.2%), Headache (69.6%), and Body Ache (68.5%). In fact, 38% as a separate symptom had Did not advise water, whether alone water or otherwise; Rash (more typical of Dengue) was reported by 31.5%.

Strange indeed given reports from African hospitals that show contrary findings confirming so that it is more likely to come on after day 4 than survive Federated infection infected There was a prevalent pattern of illness duration that was shorter than 5 days (36%) or in the range 5–10 days (40.2%).

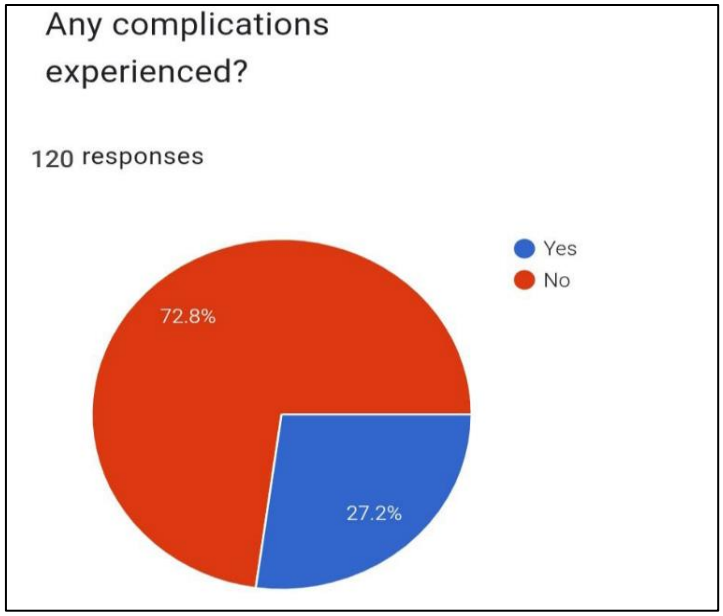


Those students claiming to have been diagnosed were hospitalized in no fewer than 22.8% of cases. Answers to the question "What test confirmed your diagnosis?" Nike Swift. The majority responded with one or the other depending on their specific diagnostic path: 35.9% selected NS1 Antigen / IgM/IgG (for Dengue) while 30.4% chose, Peripheral Smear / Rapid Test (for Malaria). A serious 16.3% reported only a Clinical Diagnosis, highlighting potential over-reliance in practice on non-specific indications.

3.4 Complications and Preventive Measures



During the survey, nearly a third, 27.2% of patients diagnosed did indeed suffer complications. A breakdown by health education program participation is as follows: Yes 50%, No 50%. All of these events were unexpected. The most frequently used prevention methods were: *Not being in or around stagnant water (66.3%). *Wearing full-sleeve clothes (65.2%) *Repellents/Coils (63%). Mosquito nets were used as a prevention method by only 40.2% of respondents, and fumigation or insecticide spray was used by just 16.3%. Meanwhile, 71.7% reported using mosquito repellents or nets all the time.

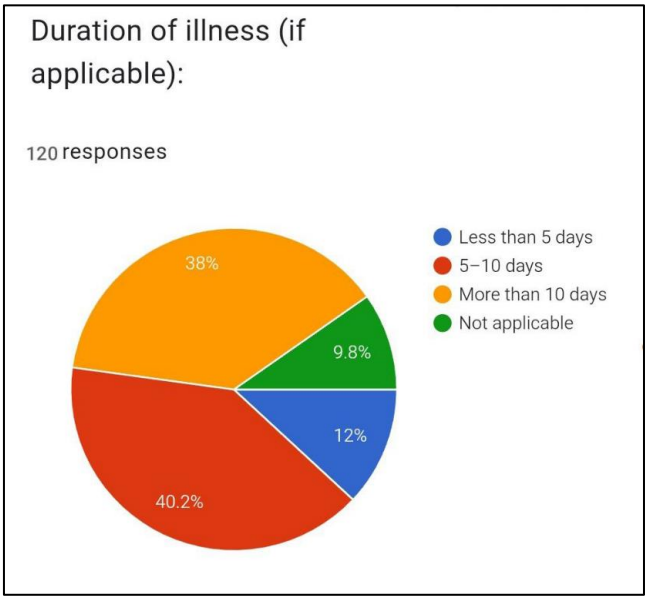


4. Discussion: Case-Based Differential Diagnosis

Its survey shows that medical students currently learn about major vectors of Malaria and Dengue fever, but a basic confusion remains concerning the etiology (Protozoa vs Virus) the very foundation for understanding how disease occurs and what best way to treat infections. Therefore, we need a kind of clear differential guide.

The process for distinguishing one diagnosis from another blends together elements of epidemiology and the clinical picture, and then crucially in many cases laboratory findings. A comprehensive comparison drawn up in Table 2 will help greatly during clinical decision making. Operation Model of Differential.

4.1 Case-Based Differential Strategy



Epidemiology:

The primary vector remains the crucial early clue; Malaria is primarily nocturne-biting *(Anopheles)*, while Dengue is diurnal-biting *(Aedes)*. The finding that the Rainy season had been severe but reported as off-peak incidence suggests neglect of epidemiology and environment in the training of our students.

Clinical Pattern:

While both illnesses cause high fever, presentation is crucial. Malaria tends to come on with classic, cyclical fever spikes (chills and rigors reported by 38% of our cohort). Dengue fever typically presents as saddle-back (biphasic) and appears with intense Retro-orbital Pain, Myalgia, and severe Joint pain (the last is Dengue literaly “break-bone” fever) (31.5% of cohort reported joint pain). Rash occurs frequently in Dengue but rarely in Malaria.

Critical Phase and Complications:

The critical phase of Dengue is characterized by plasma leakage leading to shock (Dengue Haemorrhagic Fever), a concept lost in the uncomplicated Malaria. In our student cohort, at close to one-third (27.2% to be exact), the high rate of manifestations shows how fast these problems can arise in just a few hours.

Laboratory Confirmation：

The shift from clinical suspicion to diagnosed, written-in-stone fact is driven by test where laboratory confirmation becomes paramount. The high percentage of students going by diagnosis in the majority but still depending on clinical suspicion Alarmingly (16.3%). Gold standard diagnosis should be emphasized:

- Malaria: Parasites in a thick blood smear is the gold standard still for species identification and estimation of parasite load. Rapid diagnostic tests (RDTs) for Plas- medium antigens pLDH 、HRP2.Word for quick and convenient testing.
- Dengue: In early diagnosis, it is essential first to detect the viral antigen NS1 (Non-structural protein 1) within the first five days of fever—as 35.9% of their number opted to do followed up with IgM and IgG antibodies chart thereafter.

Table 2: Comprehensive Differential Diagnosis: Dengue vs Malaria

Feature	Dengue (Viral Etiology)	Malaria (Protozoal Etiology)
Causative Agent	Dengue Virus (DENV), four Serotypes (1-4)	*Plasmodium species (P. falciparum, P. vivax, P. ovale, P. malariae, P. knowlesi)*
Vector	*Aedes aegypti and Aedes albopictus.*	*Female Anopheles mosquito.*
Biting Activity	*Primarily diurnal (daytime).*	Primarily nocturnal (dusk till dawn).
Classical Fever	High-grade, sudden onset. Often Biphasic (“saddleback”) with two peaks.	High-grade, cyclical (quotidian, tertian, or quartan) and periodic fever spikes, often with paroxysms.
Chills/Rigors	Mild or absent.	Prominent, classic finding (reported by 38% of cohort).

Feature	Dengue (Viral Etiology)	Malaria (Protozoal Etiology)
Myalgia/Arthralgia	Severe, widespread body ache and joint pain ("Break-bone fever") (reported by 68.5% body pain, 31.5% joint pain)	Body ache is common, but less severe arthralgia.
Rash	Common (31.5% of cohort), variable morphology (maculopapular, flushing).	Infrequent.
Leukocyte Cout	Typically, Leukopenia (low white cell count).	Variable; can be normal or low.
Platelet Count	Thrombocytopenia (low platelets) is universal and a key marker for severe disease	Thrombocytopenia is common, but usually less severe than in Dengue.
Haematocrit	Rising Haematocrit (due to plasma leakage) is a hallmark of the critical phase.	Falling Haematocrit (due to RBC lysis and sequestration)
Gold Standard Diagnostic (Acute)	NS1 Antigen detection (days 1-5). Followed by IgM/IgG serology.	Peripheral Blood Smear (thick and thin films) for parasite visualization, speciation, and quantification.
Critical Phase Pathophysiology	Increase in capillary permeability leading to plasma leakage, potentially resulting in shock (DHF).	Red Blood Cell (RBC) lysis and sequestration, leading to anemia and microvascular obstruction (e.g., Cerebral Malaria).
Treatment	Supportive (intravenous fluids, paracetamol, monitoring for shock). NO aspirin or NSAIDs.	Specific anti-malarial drugs (e.g., Artemisinin-based Combination Therapies)

5. CONCLUSION

The report shows that although people spend a lot of time studying medicine, a good part of those queried actually have wrong ideas about common-sense things, just as though they were still muddling around in elementary school. While the clinical pictures of fever, headache, body pain and so forth are both universally recognized, distinguishing features and how to sew up gold standards for laboratory diagnosis of them are still not quite understood. This lack of knowledge is risking diversion from ultimate treatment or even wrong therapy for patients presenting with acute undifferentiated fever. And future medical curricula will benefit from the implementation of focused teaching modules that compare, question by question, the pathogenic process, stage of critical phase and diagnostic algorithms for various diseases. Such purposeful education is necessary if those next generations of doctors are to be given the competence to decide complicated cases with different diagnoses rationally.

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