



## **A retrospective analysis of 20 febrile cases in Fortuna 1, Valle la Estrella, Limón.**

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### ***Introduction***

For years a functional system has been in place to diagnose endemic malaria in Valle la Estrella. A few months ago, however, it was predicted that dengue fever, another mosquito-transmitted febrile illness would soon be present in Valle la Estrella. The concern at the time was to know whether current protocols for detecting this infectious disease were actually effective and being followed.

Management at the time was to perform a gota gruesa on patients with a “cuadro febril desconocido” at the time of initial consultation to rule out malaria. If dengue was suspected, a tourniquet test was to be performed to rule out the hemorrhagic form. If the patient’s fever persisted longer than eight days without identification of a febrile focus then an IgM was to be performed. All patients with a fever were to be reported to the main clinic for infection tracking purposes.

The purpose of this inquiry, therefore, was to look at clinical diagnostic practices, rates of follow-up, and patient outcomes in 20 cases of febrile illness during a 6 week period during January and February of 1999. We wanted to “test the system” in Clínica La Fortuna to see if each patient with a febrile picture with no obvious focus of infection had a workup for malaria and dengue fever. We also wanted to know the rates of follow-up, particularly in patients with an incomplete workup or concerning test result.

Additionally, for demographic purposes we looked at practices used by this population to prevent mosquito-borne disease transmission.

### ***Materials and Methods***

As a mandatory reporting system for all patients with a febrile picture (cuadro febril) existed, we selected those patients reported who lived in the Fortuna 1 district including neighborhoods of Finca 8, La Guaria, La Plástica, San Rafael, and Los Nubes. In addition, patients with an available gota gruesa and IgM lab slip living in Fortuna 1 were selected. Via chart and lab record review we gathered basic information about the patients’ demographics, visits, lab results, and follow-up. Each patient was then visited at home and a questionnaire was verbally administered by the investigator. Parents were allowed to respond regarding the children; spouses were permitted to respond if the patient was not available. The questionnaire addressed the following:

1. fever duration prior to and after consultation
2. other symptoms
3. symptom resolution and current health
4. follow-up visits and reasons for no follow-up
5. risks for mosquito presence and measures to limit exposure

The data from chart review and questionnaire were entered into Epi Info. Unfortunately due to computer error and limited availability, basic calculations were performed by hand.

## ***Fundamental Questions/ “Testing the system”***

To determine whether the system was “working” we wanted to know if each patient was appropriately addressed, receiving appropriate labs. The next question addressed was whether a patient could have dengue fever that was going undetected. A patient would either need 1) a source of infection, 2) A gota gruesa to rule out malaria, 3) a fever that persisted less than 8 days, or 4) a fever longer than 8 days with a negative IgM. Any patient that did not meet the above criteria was considered concerning, as there was no definitive diagnosis and dengue fever had not been ruled out.

We also wanted to know what had happened to those patients without follow-up. Could the clinic be comfortable that those patients would have labs to rule out malaria and dengue fever, and that they would consult the clinic if their fever persisted for longer than 8 days?

## ***Results and Conclusions***

### **1. Demographics:**

In this study 20 people were interviewed. Of these, 12 (60%) were women, 8 (40%) were men with ages ranging from 3 to 65 with 28.25 years the mean and 24 the median and mode.

Distribution of patients by neighborhood were as follows: La Guaria 12 (60%), La Plastica 3 (15%), San Rafael 2 (10%), Finca 8 2 (10%), and Los Nubes 1 (5%).

### **2. Diagnosis and follow-up**

Diagnosis at the first visit ranged as follows. Patients with 2 diagnoses may appear in more than one category:

Cuadro Febril: 16	ITU: 1	IVRS: 2	Diabetes: 1
Malaria: 2	Varicela: 1	OM: 1	

Fourteen patients (70%) had a follow-up visit whether for their fever or for another reason. Diagnoses were as follows:

IVRS/Cuadro febril desconocido: 4

Cuadro febril desconocido: 3

Otra razón: 2

Each of the following diagnoses was given to only one patient at follow-up: ITU, varicela, OM, malaria, bronchitis.

### **Study according to diagnosis:**

Part of this study was to determine whether all patients with a cuadro febril desconocido, (determined either at follow-up or at initial presentation if no follow up visits were made) were receiving the appropriate labs to rule out malaria or dengue fever.

This includes 14 patients. Only one did not have a gota gruesa performed. She had IVRS symptoms and a fever that lasted 2 days. Only one patient did not have an IgM ordered. She had a fever that lasted 9 days with diarrhea and cold symptoms and a diagnosis of IVRS, with no follow-up visit. Of four patients that did not have an IgM received in the lab, 1 had a fever of less than 8 days. Two had fevers of 8 or more days that resolved without complications. Only one of these patients had a follow up visit. The final patient’s fever recurred and at the time of the study was undergoing further work-up.

We can conclude that the clinic's system works well and that tests are being ordered appropriately. The patient that did not have an IgM ordered did not raise suspicions for dengue fever. It is concerning, however, that two patients had fevers of 8 or more days without returning to the lab for their IgM or for a follow-up visit.

#### **Study according to follow-up:**

Six patients (30%) did not have a second visit. Two of these felt better and saw no need for a clinic visit but reported that they would have returned within a week if their fever had persisted. One patient was a child with malaria diagnosed after 13 days of fever. His fever resolved after two days of treatment and no follow-up was pursued by the parents due to transportation problems. One was a nurse, one the spouse of a physician, and these people received medical follow-up without an official visit, and one child without documentation who was not allowed clinic visits as they were not funded by social security. He did have a fever for longer than 8 days but a negative gota gruesa and IgM. His mother reported that they would have returned to the emergency department had his fever persisted longer than a week after his initial emergency visit.

Of the 6 patients without follow-up, 4 (67%) had received both a gota gruesa and an IgM. One patient had a positive gota gruesa and was treated for malaria, with IgM considered unnecessary as a febrile focus was found. The other patient was Justa Carrillo Carrillo who is discussed under tests and results.

#### **3. Tests and Results:**

Of the 20 patients seen, 13 (65%) received a tourniquet test with 8 negative (32%) and 5 positive (38%). All patients except one (95%) received a gota gruesa test, two of which were positive (11%) and 17 negative (89%). Sixteen had an IgM ordered (80%) and of these 16 ordered, 11 were received in the lab (69%). Five (31%) had no lab records of an IgM being received. At time of study, no IgM tests had returned positive.

#### **Study According to Tourniquet Tests:**

Tourniquet tests were performed at the discretion of the physician and are a fair indicator of their suspicion for dengue fever. Of the 13 patients receiving a tourniquet test all except one had an IgM ordered. Three did not have an IgM received in the lab.

Of great concern is that one patient with a positive tourniquet did not return for an IgM to be drawn. Her fever, however lasted only two days which rules out dengue, and she was seen in follow-up. The other two had negative tourniquet tests and no IgM received, one patient had a fever for 8 days which is concerning (Ruperto Solano Villafuerte of La Plastica), however he was doing well at the time of interview. And the patient who did not have an IgM ordered actually had a positive tourniquet test and a fever that lasted for 15 days (Geiner Moya Moya of Finca 8). He was given the diagnosis of bronchitis with diabetes. He was originally seen in an outside clinic and some confusion arose as to whether the test had been performed there. As it stands, however, this clinic has no record of an IgM and this patient is concerning for that reason. However at interview he was doing well without symptoms or concerns.

It can be concluded that the physician's patterns of ordering tourniquet tests and subsequent labs is appropriate in almost all cases studied. A difficult issue is that some patients do not return for an IgM, even with fevers greater than 8 days.

#### **4. Fever Duration**

The number of febrile days prior to consultation ranged from 2 to 15 with 8.5 the mean and 8 the median. These were divided into two groups with fever duration of eight or more days suspicious for dengue fever.

#### **Study according to fever duration**

Fourteen patients (70%) reported fevers of 8 days or more. All 14 had a gota gruesa with only one (7%) positive. Of these 14 people 11 (79%) had an IgM ordered and 8 of these 11 (72%) patients' tests were received in the lab.

Of the patients without an IgM ordered, one was diagnosed with malaria after 13 days of fever which resolved with treatment after 2 days. Another was initially seen in an outside clinic and was seen in follow-up after treatment for bronchitis (Geiner Moya Moya discussed above). The final patient had an IVRS and consulted the clinic on day 8 of her fever (Justa Carrillo Carrillo of La Guaria). Although the fever resolved the next day, this case is also a bit concerning as this is a patient with a longer fever and no IgM. However, there does appear to be a focus for her infection. She was not seen in follow-up but on interview was doing well.

Of these three patients without an IgM received, one returned for a follow up visit with their fever resolved without complications, one did not return as he felt better. No evident focus for infection was found, however. And one patient returned to the clinic for a relapse in her fever (Idalie Torres Torres of Finca 8) who at the time of the study was undergoing further work-up.

Six patients (30%) reported fevers of less than 8 days. Five (92%) received a gota gruesa with 1 of the 5 (20%) positive. The one patient who did not receive a gota gruesa had a positive tourniquet test and an IgM that was ordered but not received and her fever resolved after two days.

There is a fairly good rate of IgM being ordered in patients with fevers of greater than 8 days duration without an evident focus. One patient had an incomplete workup (Geiner Moya Moya) ordered, and two patients did not have their IgM received in the lab.

#### **5. Outcomes**

Of all patients screened, 19 had a full resolution of their febrile illness. Patients' symptoms at interview or at follow-up visits appeared unrelated to the original illness. One patient had a relapse of her fever and was undergoing a work-up at time of interview.

#### **6. Mosquito risks and prevention**

Of the 20 patients 14 (70%) reported still water (agua negra) near their homes.

The following measures were used for mosquito bite prevention:

Closing the windows at night	12 (60%)
Window screens	5 (25%)
Fan	11 (55%)
Mosquito net	6 (30%)
Gala smoke coils	4 (20%)
Repellent	2 (10%)
Outdoor insecticide (Baygon)	2 (10%)

## ***Discussion/Conclusions***

On the whole results were encouraging with two patients with incomplete labs but somewhat reliable ivrs sources for their fever and good follow-up..

Three patients did not effectively have dengue fever ruled out. In two patients the physicians ordered labs appropriately, but they were not received in the lab. In only one patient no IgM was ordered.

On the whole patients were quite reliable in returning to clinic for appropriate follow up visits. All patients who did not return felt better in an appropriate amount of time.

The most concerning issue was that many patients did not return to lab for the IgM tests ordered, even with fevers for longer than 8 days. It may be necessary to stress the importance of this with patients at their initial visits.

The data on prevention of mosquito-transmitted diseases have a few sources of error, especially as most patients confessed to sitting outside after dark for some time prior to sleeping. Effective education may need to be broadened, but most patients are aware of prevention methods but are reluctant to put them into practice.

Additionally, results may be skewed by several factors. Fever duration is based on patient report, not actual measurements, which is subject to significant error. Also, the sample was selected from reports and lab records. Any patient who did not receive labs or was not reported would not be included and would have received an incomplete work-up. It is hoped, however, that few patients would be in this category.

It appears, then, that the system for detecting dengue fever in Clinica La Fortuna is fairly effective. Most patients receive either a definitive diagnosis or appropriate work-up to rule out malaria and dengue fever. As dengue approaches the Valle it is important for physicians to remain conscientious in following the current protocols, as they appear to be working fairly well for the time being.