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Fever thrombocytopenia: A clinical and laboratory profile

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Background: The idea of fever is widely present in human literature, music, and art, and it has even been the subject of scientific investigation. Since fever is such a common indication of illness, finding detailed accounts of febrile patients in early historical records is not surprising.

Materials and Methods: This study will involve patients who are admitted to the D.D. Medical College and Hospital's Department of General Medicine in Thiruvallur, Tamil Nadu, India between January 2012 to December 2012. A prospective collection of one hundred patients with low platelet counts and fever will be made. The age range of the participants was 18 to 79, however this did not limit the study in any way. Of the hundred individuals diagnosed with fever and thrombocytopenia, fifty-eight were men and forty-two were women.

Results: Just 16 persons were unable to recuperate, while 84 people did so completely. Following up, thirty of the eighty-four patients who recovered completely had platelet counts that were within normal limits after being discharged. There were sixteen deaths in all, eleven from septicemia and multiorgan failure syndrome and five from dengue fever.

Conclusion: These feverish illnesses were molded by thrombocytopenia, which frequently resulted in bleeding signs. Patients who experience spontaneous bleeding ought to be assessed for disseminated intravascular coagulation. Patients with malaria do not require platelet transfusions since their platelet counts return to normal rapidly after therapy.

Keyword: Clinical, laboratory profile, fever, thrombocytopenia, platelet transfusions

Introduction

The subject of fever is unavoidable throughout human mythology, art, and science. Since fever is such a common indicator of illness, it is not surprising to discover accurate descriptions of feverish individuals in early historical writings. A platelet count in the blood that is below normal is known as thrombocytopenia. A typical platelet count for blood is between 1,50,000 and 4,50,000 platelets per microliter ^[1]. Thrombocytopenia is often diagnosed by regular complete blood counts in asymptomatic patients. A platelet count of less than 150,000/ μ l is referred to as thrombocytopenia. This is brought on by a decrease in platelet formation, an increase in destruction, and an increase in splenic

sequestration. The most frequent cause of thrombocytopenia is infection ^[2]. Thrombocytopenia patients may present with bleeding symptoms such as petechiae, epistaxis, bleeding gums, hemoglobinuria, bleeding in the gastrointestinal tract, or bleeding inside the brain. It is the most typical reason why kids bleed.

Dr. Paul Beeson's 1948 discovery that fever is caused by inflammatory cells within the host marked the beginning of current research in this field. This endogenous pyrogen is produced by mononuclear phagocytes, contrary to conventional thinking, which held that it was a byproduct of polymorph nuclear leukocytes. Leukocyte endogenous mediator, mononuclear cell factor, and lymphocyte activating factor

(LAF) are all chemically identical to or very similar to interleukin-1^[3]. The available data strongly implies that fever and thermoregulation are related processes involving interleukin-1 (IL-1). Normal human body temperature has highs in the afternoon and lows in the morning. The average temperature is in the neighborhood of 37.2 °C. Because a fever is most likely to peak in the afternoon and evening, these are the times when temperatures are often highest^[4].

Fever is the term for an increase in core body temperature that occurs outside of the typical 24-hour cycle due to disruptions in the anterior hypothalamus thermoregulatory region. A body temperature of 37.7 degrees Celsius or higher in the evening, or 37.2 degrees Celsius or higher in the morning, is considered a fever. If the platelet count is fewer than 150,000 per microliter of blood, thrombocytopenia is thought to be present. This is due to a decrease in production, an increase in destruction (both immuneogenic and non-immunogenic), and an increasing amount of it being stored in the spleen. A primary cause of thrombocytopenia is infection. A clinical entity exhibiting a prolonged fever course might have its differential diagnosis narrowed down with the aid of thrombocytopenia-induced fever^[5].

Severe fever and low platelet counts can be caused by a number of infectious diseases, such as dengue, typhoid, HIV/AIDS, malaria, typhoid, and military tuberculosis. Therefore, to shorten the time needed for investigation and diagnosis, a systematic, all-encompassing approach must be implemented, bearing in mind the possible reasons for fever associated with thrombocytopenia. Therefore, more investigation is needed to determine the contributing variables to fever linked with thrombocytopenia. The primary goal of this study was to gain a better understanding of the clinical features of fever associated with thrombocytopenia. Find the cause of the low platelet count and high temperature. Analyzing the clinical effects of thrombocytopenia and fever^[6].

Methodology

The Department of General Medicine at D.D. Medical College and Hospital in Thiruvallur, Tamil Nadu, India, will be the subject of this study from January 2012 to December 2012. A hundred patients with fever and

thrombocytopenia will be recruited. The age range of study participants was 18-79. Study sex was disregarded. Fever and thrombocytopenia were found in 42 women and 58 men.

Inclusion Criteria

- Adolescence patients, regardless of gender.
- Patients who were hospitalized for fever and subsequently diagnosed with thrombocytopenia are included in the study.

Exclusion Criteria

- Those with a fever but no thrombocytopenia;
- Those without both a fever and thrombocytopenia;
- Children under the age of twelve are not included.

The patients who were admitted with fever and thrombocytopenia underwent a general physical examination following a comprehensive history and physical examination. Comprehensive examinations of multiple distinct structures were carried out. Both general research and specialized research were done as necessary. We made every attempt to follow up with patients who received therapy, had a confirmed diagnosis, and whose out-of-pocket expenses allowed for a follow-up platelet count at discharge, but we were unable to do so. Periodically, reports were kept on the patient's physical examination, history, and any pertinent technical or laboratory tests.

Results

Fifty patients who were admitted to our hospital were examined over a period of eighteen months. Although no particular age range was targeted, study participants ranged in age from 18 to 79. The research did not take the patients' sexual orientations into account. Of the one hundred individuals diagnosed with thrombocytopenia and fever, forty-two were female and fifty-eight were male. Hospital stays varied from three days on average to twenty-one days on median. Usually, patients stayed in the hospital for seven days. One hundred out of the one hundred patients had a diagnosis of fever with thrombocytopenia; the most common cause was malaria, followed by enteric fever, septicemia, dengue, and leptospirosis. Plasmodium vivax is responsible for the majority of malaria cases, followed by

Plasmodium falciparum, and ultimately a combination of the two.

Sixteen of the 100 patients died, and the rest 84 made full recoveries. When these thirty of the eighty-four patients who recovered completely were discharged from the hospital, their platelet levels were within normal limits. Out of the

overall number of deaths, eighteen were linked to dengue fever, four to multiorgan failure syndrome, and twelve to septicemia. Seven of the sixteen death cases had platelet counts that were primarily between 100,000 and 200,000 per cubic millimeter.

Table 1: Evidence from the study's preliminary stages

Sr. No.	Particulars	Patients
1.	Total no. of patients	100
2.	Age range in years	20-80 years
3.	Male and female	56:32
4.	Range of duration of hospitalization	4:14
5.	Average duration of hospitalization	9
6.	Definitive diagnosis	100
7.	Malaria as the common cause	42
8.	In malaria, vivax as common cause	22
9.	61,000-80,000 was common range of platelet count	37
10.	Clinical manifestation of thrombocytopenia	48
11.	Bleeding manifestations of thrombocytopenia	32:19
12.	Good recovery	85
13.	Mortality	16
14.	Septicemia as the common cause of mortality	15
15.	Good recovery cases followed up	29

In one hundred cases out of one hundred, the patients received an accurate diagnosis. 42 percent of the instances of these illnesses were caused by malaria, making it the primary cause. Twenty of the cases of malaria were caused by vivax malaria, fourteen by falciparum malaria, and eight by mixed malaria. This is the breakdown of malaria cases.

Table 2: Frequency of Thrombocytopenia in Patients with Fever

Sr. No.	Disease category	Patients
1.	Malaria	39
2.	Enteric fever	26
3.	Septicemia	17
4.	Dengue	16
5.	Leptospirosis	2
	Total	100

The second most common cause, enteric fever, accounted for 26 cases. Septicemia (17 cases), dengue (16 cases), and leptospirosis (2 cases) trailed closely behind.

Table 3: Cases of thrombocytopenia due to malaria

Sr. No.	Type of malaria	Patients
1.	Vivax malaria	20
2.	Falciparum malaria	14
3.	Mixed malaria	08

Malaria strains that are caused by low platelet levels eight cases of mixed malaria, twenty cases of vivax malaria, and fourteen cases of falciparum malaria were identified among the total number of confirmed malaria cases. The last patient with mixed malaria had strains of both falciparum and vivax.

Table 4: Predictors of death in our sample

Sr. No.	Disease category	Patients
1.	Septicemia	11
2.	Dengue	5
	Total	16

Eleven of the sixteen fatalities were found to have had septicemia as their primary cause of death. Thus far, five distinct cases have been linked to dengue fever as the cause of death.

Discussion

The previously indicated requirements must be met by patients in a research of fever with thrombocytopenia; additionally, prospective case collection is necessary, and close monitoring is advised. We can define a representative sample from which to make inferences using these three criteria. Evaluating the breadth and methodologies of the investigation is also essential, but it can be challenging. Over the course of a year and a half, Nair PS, A. Jain, U. Khanduri, and V. Kumar conducted the study at St. Stephen's Hospital in New Delhi. A total of 109 instances (76 male, 33 female patients) were examined using the same criteria as our study. Septicemia was the most common cause of fever with low platelet counts, with 29 cases reported. Enteric fever accounted for 16 cases, while the next most common causes were dengue, megaloblastic anemia, malaria, and haematological malignancy, with 10, 4, and 10 cases each ^[6]. Twenty-eight patients had lower platelet counts, while sixty-two patients, or 49%, had counts between 50,000 and 1,000,000. Out of 109 people, only 45 (41.3%) displayed thrombocytopenia symptoms. Spontaneous bleeding accounted for 31 out of 45 patients, or 69% of the bleeding symptoms. Over the course of the follow-up, the platelet counts of 69 patients grew, while those of 8 patients continuously decreased ^[7].

Fever and thrombocytopenia were primarily caused by infections, with a relative incidence ranging from 68% to 100%. We discovered that infection was the more prevalent and conclusive diagnosis in our analysis when compared to other studies where both infection and haematological diseases were recorded. Maybe there are regional and seasonal variations at work here. Nonetheless, infections were the most common cause of fever and low platelet levels. Malaria was the most common infectious etiology in this investigation, with septicemia predominating in other cases. Changes in the climate and weather patterns are to blame for this ^[7]. While malaria was determined to be the fifth most common cause of fever with thrombocytopenia, our research revealed that septicemia was the third most common cause of this symptom. In our investigation, fever and thrombocytopenia were observed in 15% of cases but were not considered

presenting features of a haematological disease. Enteric fever was revealed to be a significant contributing factor in patients seeking medical attention in both our study and the other study. The percentage of patients with Dengue/VHF infections in our research was 14%, compared to 13% in the prior study ^[8].

Another study's diagnosis rate was 18.3%, however our study's perfect rate was 100%. We discovered that, in contrast to earlier studies, 49% of our subjects had thrombocytopenia symptoms. In our investigation, we discovered that the most typical bleeding symptoms were Petichae/purpura and spontaneous bleeding. This study demonstrated that spontaneous bleeding was the most common bleeding manifestation, in contrast to earlier research that indicated petichae/purpura to be the most common bleeding symptoms ^[9]. The percentage of participants in our experiment with platelet counts in the 50-100 thousand range increased to 65 percent from 56.8 percent in the previous research. Between 20 and 50000 platelet counts were present in 23% of patients in our study and 25% of participants in another investigation. Over the course of the study's follow-up, platelet counts increased in 63.3% of participants, whereas 7.3% showed a consistent reduction. Even though the data indicated growing platelet patterns at the time of discharge and in future follow-up, only thirty percent of patients were followed up with. This was largely brought on by how costly it was. No descending platelet trends were observed ^[10].

Due to seasonal and regional variations, infections were the primary cause of fever with thrombocytopenia. The most common kind of infection was malaria. In this instance, addressing the underlying cause resulted in a significant increase in platelet count. According to our data, septicemia accounted for 78% of deaths, with dengue coming in second with 22%. It was discovered that a significant number of patients with thrombocytopenia and nonspecific fever had infectious diseases. Most of these individuals had leptospirosis, dengue, malaria, enteric fever, or another virus. When an illness is prevalent in a certain location, a patient's reaction to an empirical therapy trial may help guide the physician's following care. In the future, new microbiological and pathological imaging tools will be needed for the investigation and diagnosis

of several viral hemorrhagic fevers. Thrombocytopenia is a condition that about 80% of malaria patients suffer ^[11].

According to UM Jadav's study, "thrombocytopenia in malaria - association with type and severity of malaria," there is a connection between patients' levels of white blood cells and their malaria subtypes. The platelet count was normal in 21% of the patients. However, our n=41 study did not find any patients with a normal platelet count. We discovered in our and their studies that biochemical signs of DIC or clinical bleeding were not always present with thrombocytopenia. A platelet count below 25,000/l is not unheard of, but it is feasible. Because platelet counts rise quickly following recovery from malaria, platelet transfusion is not necessary in these cases. UM Jadav *et al.* discovered that thrombocytopenia was present in 78.4% of cases in their study on the disease, and they pointed out that a sustained platelet count is unlikely to be present in malarial laboratory results. Thrombocytopenia was observed in 49-90% of patients in India who had plasmodium falciparum infections. A possible consequence of DIC's consumption and destruction of the periphery is malaria's thrombocytopenia. In Indian literature, there has been a report of a 43-year-old patient with vivax malaria who had severe thrombocytopenia with a platelet count as low as 5000/l ^[11].

Conclusion

Fever and blood cell loss are two of medicine's main concerns. Rare diseases hardly ever cause thrombocytopenia and fever. Low platelet counts and fever are typical symptoms of infections. The deadliest infectious disease was malaria. The symptoms of typhoid, dengue, and atypical and hidden malaria delay and complicate diagnosis. Clinics need to be cautious. IgM ELISA for leptospiral and dengue antibodies; rapid spot test; etc. The majority experienced transient, asymptomatic thrombocytopenia. These feverish illnesses were molded by thrombocytopenia, which frequently resulted in bleeding signs. Patients who experience spontaneous bleeding ought to be assessed for disseminated intravascular coagulation. Patients with malaria do not require platelet transfusions since their

platelet counts return to normal rapidly after therapy.

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