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Continuous thrombocytopenia during dengue fever inpatients, its signs, effects, and treatments, herbal medication as well as dengue infection in mosquito vector with typological aspects taking into consideration

**Tkachenko Elena Viktorovna¹, Jha Sahil Kumar², Bheraram Akash³,
Mokhtari Hamid⁴, Mokhtari Liana⁵, Almadaineh younes Mohammed⁶**

¹ Candidate of medical sciences, Physiology chair assistant,
the Responsible for all International students scientific activity in PSMU;
Poltava State medical university; Ukraine

² Student International faculty, General Medicine;
Poltava State medical university; Ukraine

³ Student International faculty, General Medicine;
Poltava State medical university; Ukraine

⁴ Dentist, graduates 2013;
UMSA; Ukraine

⁵ Dentist, graduates 2013;
UMSA; Ukraine

⁶ Student, International faculty, General Medicine;
Poltava State medical university; Ukraine

Abstract. The dengue virus is the pathogenic illness that causes dengue (DENV). Generally speaking, dengue is an acute infectious sickness that heals on its own, but with a crucial significantly influencing phase during which patients may get well or develop a serious case. Hemodynamic abnormalities, increased vascular permeability, hypovolemia, hypotension and shock are symptoms of severe sickness. In all situations, thrombocytopenia and platelet malfunction are widespread and are associated with the treatment outcomes. Additionally, we will use a line graph to show the patients' platelet depletion (thrombocytopenia) during dengue fever and analyze the levels of platelets during in the illness before drawing conclusions. We'll talk about some patient reports and their experiences after overcoming dengue fever. In India, patients take herbal medications to boost platelets while simultaneously talking about the psychological effects of fever or the days following a fever.

Keywords: *Parasitology, typological aspects, Dengue, viruses, Arboviruses, Flaviviruses, Dengue epidemiology, Dengue pathogenesis, Dengue clinics, Dengue diagnostics, Dengue treatment, Dengue prevention, Dengue haemorrhagic fever, Aedes, mosquitos, thrombocytes, platelets, thrombocytopeny, platelets depletion,*

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cardio-vascular system, hemodynamic abnormalities, vascular permeability, blood circulating volume, hypovolemia, arterial pressure, hypotension, spleen, splenomegaly, shock, herbal medicines.

The Aedes genus of mosquitoes, specifically Aedes aegypti and Aedes albopictus, are the vectors that carry the virus from human to human. Since it is now generally understood that the host immune system, host genetics, and pathogen virulence all play a part toward gradual loss observed in some patients, the exact pathophysiology of severe dengue infection (dengue hemorrhagic fever and dengue shock syndrome) is still a mystery. In the regions, dengue is a significant public health problem because of its increased occurrence. With rounds of infections arising after each monsoon season, dengue infections typically correlate seasonal climate change. Millions of people could be impacted by a pandemic. Given the fact that the majority of individuals recover from a simple rheumatic fever, a tiny but considerable fraction go on to acquire dengue. Although most of people fully heal from a simple primary infection a minor but significant percentage go on to create the dengue shock state with associated fatalities. These factors include the vector population's capacity to transmit fatal disease, an absence of knowledge of pathophysiology, the absence of a particular treatment and a vaccine for preventative measures. In this aspect in a high case fatality rate is observed among adolescents and people of working age in the many afflicted locations (ethnic, age and ethno-age typological aspect). The challenge of containing dengue: there are three main reasons why an infection occurs, namely the existence of four distinct serotypes of viruses, each having their own as well as immunity state.

The disease is caused by Arbovirus, belongs to one of the utmost serious arboviral infections around the world, Dengue virus (DENV) was found to be transmitted through bites of female (gender typological aspect) Aedes mosquitos especially Aedes (Stegomyia) aegypti (mainly) [1], Ae.albopictus, Ae.niveus and Ae.polynesiensis. WHO has reported in 2019 about 100 endemic countries on Dengue fever that defines and increases the topic studied actuality. It has been estimated by the British, American and Chinese epidemiologists in 1990–

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2015 that almost 4 billion of people have a bad chance to get sick while almost 50-100 million of people get infected with this disease annually (ethno-age typological aspect) [2; 3]. As a whole the morbidity rate has increased since 1980 mainly in Asia, Southern America and the Caribbean [4, 5]. Ethnic typological aspect was also mentioned in the article concerning to Dengue importing to Poland [6]. Dengue as hemorrhagic fever was described in Poland, historically first Dengue has been diagnosed in France (metropolitan part) and then in a German traveler coming back from a trip to Croatia; the *Aedes albopictus* mosquitoes were found in some European countries in part in Netherlands; the Europeans get sick rather rare, usually after the infected mosquitoes bites when the mosquitoes are imported from endemic areas by airplanes (ethnic typological aspect); hemorrhagic character is defined by thrombocytopenia, leucopenia because leucocytes carry proaggregants, procoagulants and participate in secondary/coagulational hemostasis or blood coagulation [7; 8], also liver gets damaged by the virus at Dengue that can result into haemorrhagies because liver is a place for synthesis of vitamin-K-dependent plasmic procoagulants – the factors II, VII, IX and X – prothrombin, proconvertin, thromboplastin plasma precursor and Stuart-Prauer's factor [9].

Countries particularly China develop vaccines and immunization strategies for Dengue prevention [10]. Dengue virus is thought to be treated together with Zika viruses with one-two punch of vaccine and vector blockade in China; recombinant protein-based dengue vaccines were created and studied in India [11], though there is only one licensed Dengue vaccine Dengvaxia unabling to define well-balanced defense against all serotypes that results into various approaches for the vaccines exploration namely tetravalent live attenuated, inactivated, plasmid DNA, virus-vectored, virus-like particles as well as recombinant subunit vaccines; also anti-Dengue vaccines were studied in the USA [12].

There exists separately Dengue immunology advancing vaccine development in the USA [13], Korea, Germany (while emphasizing to the antibodies paradoxical role in Dengue virus infections) [14].

Dengue infections are thought to be among the most frequent reasons of febrile disease in the tropical countries [15].

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Cardiac complications as myocardial insufficiency have been described with ethnic typological aspect taking into consideration in Sri Lanka in 2005 [16], Thailand [17], India [18], as atrial-ventricular block with ventricular asystole in India [19]; there exist research with the ethno-age typological aspect taking into account in the Indian children having spontaneous resolution of sinoatrial exit block and atrioventricular dissociation [20], ventricular trigeminy in the 55-year-old patient in Sri Lanka (cardiac arrhythmias appear during the Dengue hemorrhagic fever acute stage and Dengue myocarditis is considered to be the arrhythmias most possible reason) [21].

Our own results

Patient case history 1. Patient named Ms. Geetanjali aged 18 years old from Varanasi (UP) India visited OPD on : *date* with the complaints of some symptoms: fever, nausea, and vomiting along with rash, muscle, joint or bone discomfort. Then the patient was advised to take a report of urine analysis and complete blood count and observed that platelets count is lower than the normal. Then a test for Dengue IgG, IgM, NS1 Ag (Immunochromatographic test) observed that: Dengue IgG- negative, Dengue IgM - weak positive, NS 1 Ag - positive. The doctor noticed primary Dengue infection and advised Dengue ELISA for conformation. Further patient was put under observation for 7 days and daily platelets count was monitored. Day wise platelet count of the patient:

Date Platelets in (Lac / Cu.mm) : 22.10.2022, 23.10.22 - 0.52, 24.10.2022 - 0.48, 25.10.2022 - 0.34, 26.10.2022- 0.37, 27.10.2022 - 0.96, 28.10.2022 - 1.68.

These observations led us to the conclusion that the patient's platelet count decreased as the dengue impacted them and returned to normal once they had recovered.

We also observed another patient.

Patient case history 2. Patient named Mr. Ajay Sharma aged 22 years old from Delhi, India visited OPD on : *date* with the complaints of some symptoms: fever, nausea, and vomiting, rash, muscle, joint or bone discomfort. Then the patient was advised to take a report of urine analysis and complete blood count and observed that platelets count is lower than the normal. Then a test for Dengue IgG, IgM, NS1 Ag (Immunochromatography test) observed that: Dengue IgG-negative, Dengue IgM - weak positive, NS 1 Ag - positive. The

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doctor noticed primary Dengue infection and advised Dengue ELISA for conformation. Further patient was put under observation for 10 days and daily platelets count was monitored. Day wise platelet count of the patient:

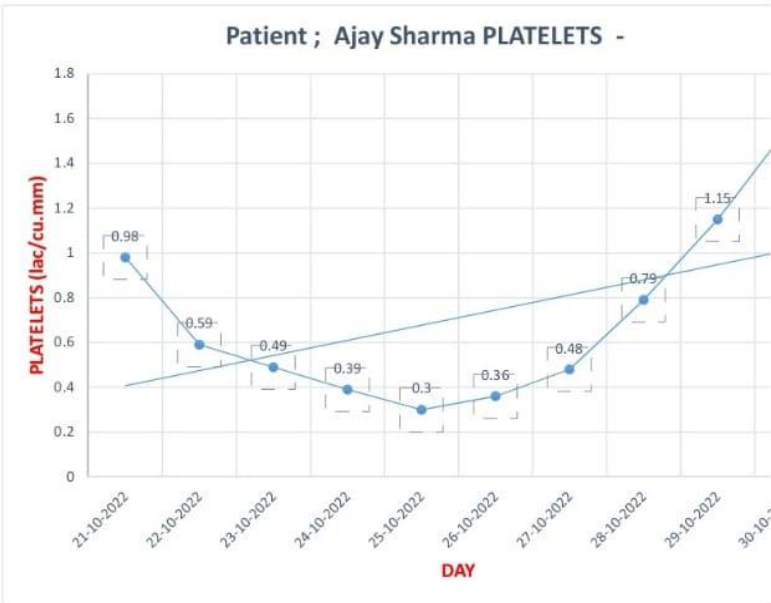
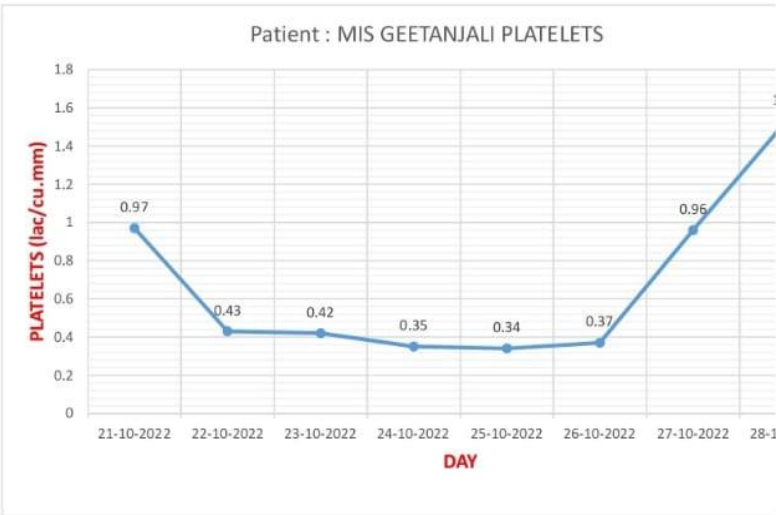
Date Platelets in (Lac / Cu.mm): 21.10.2022 - 0.98, 22.10.2022 - 0.59, 23.10.2022 - 0.49, 24.10.2022 - 0.39, 25.10.2022 - 0.30, 26.10.2022 - 0.36, 27.10.2022 - 0.48, 28.10.2022 - 0.79, 29.10.2022- 1.15, 30.10.2022 - 1.58.

These observations led us to the conclusion that the patient's platelet count decreased as the dengue impacted them and returned to normal once they had recovered.

Thrombocytes' level decrease is caused by antibodies, interestingly that anti-Dengue IgG passes through placenta and get accumulated in the child's blood in course of the first 4-6 months of life that creates significant protection for the babies while the infectionning increase is observed after one year of extra-embryonal life in them (age typological aspect); platelets have toll-like receptors (TLRs) participating in the apoptosis process as well; platelets interact to lymphocytes, neutrophils, monocytes to form platelet-leukocyte aggregates, these interactions can be involved into immune reactions against platelets by means of toll-like receptors and glycoprotein V1; these mechanisms of viral anti-platelet action are also actual except the ones described in [7] and [8]; crossed immune reactions can be observed against Dengue viruses and COVID-19 causative agents also it is worthy to remember about endotheliocytes activation, thrombocytosis and hypercoagulation at the second disease comparatively to the first one with thrombocytopeny, weakened vascular-platelet and coagulation hemostasis and further hemorrhagic syndrome beginning from rash due to disordered platelets' angiotrophic function (in norm 15% of platelets feed vascular wall with growth factors, procoagulants, if this numeral is less, then vascular fragility with formed elements leaving the vascular bed occurs resulting into rash) and ending with severe Dengue with significant bleedings and hemorrhagic shock [22].

There are many non-solved tasks before the specialists belonging to Medicine theoretical and applied branches all over the worlds about Dengue multi-facetated study. We hope that our modest research set will contribute into it.

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