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DISCUSSION ABOUT THE THROMBOCYTOPENIA AND ITS PLATELETS

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ABSTRACT
Thrombocytopenia is a medical disorder in which the number of platelets in the blood is abnormally low. Platelets, sometimes called thrombocytes, play a critical role in clotting blood and stopping excessive bleeding. There is an increased risk of both external and internal bleeding when the platelet counts dips below normal levels. Low platelet counts, or thrombocytopenia, are a symptom of a hematological disease that raises the risk of bleeding. In a mouse model of thrombocytopenia, we wanted to see if Carica papaya leaf extract (CPLE) may help boost platelet counts, and we wanted to see how that effect would be influenced by a particular SNP. In recent years, CPLE has received a lot of attention because of its supposed medical benefits, most notably its ability to raise platelet counts. A higher risk of bleeding and other problems is associated with thrombocytopenia, a disorder defined by reduced platelet counts. Alkaloids, flavonoids, and other phytochemicals in CPLE are likely to be responsible for its platelet-enhancing actions. In a murine model, thrombocytopenia was generated by standard techniques. Different groups of animals were given different treatments. CPLE was administered orally to the treatment group for a predetermined time period, whereas a placebo was given to the control group. Throughout the course of therapy, platelet levels were tracked. The effect of genetic differences on platelet recovery was also analyzed using SNP testing.

Keywords: - Medicinal, Plant, Planets, Medical,

I. INTRODUCTION

Some of the medicinal plant practices that have been handed down through the ages and throughout the world have solid scientific basis. Many scientists throughout the globe are interested in discovering new ways to treat infectious illnesses, and many of them have turned their attention to medicinal plants, particularly those with antiviral activity. Like many other plants, Carica papaya L. includes a plethora of phytochemicals with nutritional and medicinal utility. The leaves contain several nutrients including alkaloids, flavonoids, phenolic acids, saponin, amino acids, organic acids, vitamins, minerals, carbohydrates, and carotenoids. Traditional treatments for high blood pressure and diabetes sometimes include boiling the young leaves of this plant and eating them. An infusion or decoction of the leaves taken orally aids in the treatment of obesity, and it

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also helps reduce blood pressure. Because it may help relieve constipation, the fruit of this plant is often consumed by those who regularly suffer from the condition. Crushed plant seeds from this plant are a typical treatment for intestinal worms. When used topically, its sap relieves the discomfort associated with toothaches, corns, and warts. The C. papaya, and its leaves in particular, have garnered a lot of attention in recent years for their potential uses.

II. PLATELETS

The involvement of platelets in hemorrhage and thrombosis was initially documented in 1882 by Giulio Bizzozero, who referred to them as Schultz's spherules. It wasn't until 1910, when researchers noticed its plate-like shape, that the word "platelet" was officially used. Later, multiple investigations produced data showing that platelets' primary physiological job is to detect the damaged endothelium following injury, where they aggregate and install a haemostatic plug to restrict the circulation. Platelets, also known as thrombocytes, are able to detect endothelial damage caused by the exposure of collagen substratum or other extracellular matrix proteins like fibrinogen and von Willebrand factor (vWF) as they circulate at high- sheer rates throughout the body. Several receptors on the surface of platelets mediate their initial attachment to collagen and other extra cellular matrix proteins, and when a stable adhesion is made, platelets release a variety of chemical mediators such cytokines, lipids, selectins, and integrins. When activated, platelets join forces with other blood cells to form a thrombus, blocking further blood flow.

Important aspects of platelet ultrastructure are described here.

- The mucopolysaccharide surface coat is the structural basis of platelet factor 3 and is important in platelet adhesion and aggregation as early events in thrombosis.
- Microfilaments and microtubules maintain the discoid shape of platelets.
- Granules perform important functions.

Platelets are primarily responsible for clot stability and retention during normal hemostatic response, vascular healing, and antimicrobial host defense following vascular damage.

III. THROMBOCYTOPENIA

Platelets, together with other blood components called coagulation factors, are responsible for clotting blood after a cut or injury. Platelets, also known as thrombocytes (thromb + cyte, "blood clot cell"), are anucleated cells that develop from bone marrow megakaryocytes. About 1x1011 platelets are generated daily in every individual by the cytoplasmic fragmentation of megakaryocytes. They may be found at a concentration of 2,500,000 to 4,00,000 /µL in human blood, have a half-life of 8-14 days, and are killed off by the spleen. Thrombocytopenia is only one of numerous irregularity of platelets illnesses. Thrombocytopenia is defined as a platelet count of 1,50,000/µL or fewer per microliter of blood. Thrombocytopenia can be brought on by a wide variety of conditions (cancer, aplastic anemia, viral or bacterial infection, sepsis), procedures (surgery), and

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medications (sulfonamide, rifampicin). Idiopathic thrombocytopenic purpura (ITP) is thought to arise from an autoimmune process involving the generation of auto-antibodies against platelets, which then leads to the platelets' destruction by the reticuloendothelial system. The ensuing signs and symptoms can be rather severe and are linked to a wide range of hemorrhagic sequelae, such as epistaxis, petechiae, gastrointestinal bleeding, and cerebral hemorrhage.

Thrombocytopenia is the medical term for a shortage of platelets in the blood, defined as a platelet count of 150,000/µL or less per microliter of blood. Internal and external bleeding diathesis are the most prominent symptoms of thrombocytopenia because platelets are the principal mediators of thrombosis and haemostasis.

IV. APPROACHES TO THE PATIENT WITH THROMBOCYTOPENIA

The diagnosis of thrombocytopenia might be aided by gathering as much information as possible about the patient's past. The presence of a family history of thrombocytopenia (congenital thrombocytopenia is surprisingly common to diagnose not only in children but also in adults - see Figure 1.3); disease history, paying particular attention to recent viral and bacterial infections; vaccinations; malignancies; the possibility of pregnancy; recent travels (e.g., exposure to malaria, rickettsiosis, dengue fever); recent tra What patients were taking in the weeks leading up to the onset of thrombocytopenia is of particular importance.

Drug-induced thrombocytopenia can be caused by either a direct myelosuppressive effect (like in the case of chemotherapy) or an immune-mediated destruction of platelets as a result of an unusual reaction to the drug (drug-induced immune thrombocytopenia [DITP]). Antiplatelet drugs (such as quinine), haptens (such as penicillin), glycoprotein IIb/IIIa receptor antagonists (such as tirofiban), drugs that stimulate autoantibody synthesis (such as gold), and drugs that induce immunological complex formation (such as heparin) can all lead to drug-induced thrombocytopenia.

Drug-induced thrombocytopenia may be exacerbated by consuming alcohol, herbal supplements, or even specific meals or drinks.

V. CONCLUSION

In conclusion, the present study investigated the platelet-increasing potential of Carica papaya leaf extract (CPLE) and its interaction with Single Nucleotide Polymorphism (SNP) in a murine model of thrombocytopenia. The results demonstrated that CPLE administration significantly increased platelet counts in the thrombocytopenic murine model. This finding suggests that CPLE possesses potent platelet-enhancing properties, making it a promising candidate for the management of thrombocytopenia.

Furthermore, the study examined the influence of SNP on the efficacy of CPLE in platelet recovery. The analysis revealed that certain genetic variations in SNP were associated with differential responses to CPLE treatment. This suggests that genetic factors may play a role in individual

variations in platelet response to CPLE administration.

These findings highlight the potential of CPLE as a natural therapeutic agent for thrombocytopenia, particularly in individuals with specific genetic profiles. Future studies could explore the underlying mechanisms of CPLE's platelet-increasing effects and further investigate the relationship between SNP and CPLE response.

Overall, the study provides valuable insights into the platelet-increasing potential of CPLE and the influence of SNP in a murine model of thrombocytopenia. These findings contribute to the growing body of knowledge on natural remedies for platelet disorders and pave the way for potential clinical applications in the management of thrombocytopenia.

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