PAPAYA SEEDS: THEIR EFFECTS ON QUANTITATIVE PLATETLETS COUNT IN FEMALE RABBITS

Masood Ahmed[1], Farzana Memon[2], Noreen Irum[3], Ghulam Mustafa Dahri[4], Azhar Mughal[5],Gotam Kumar[6]

ABSTRACT: Objective: To evaluate pharmacological effects of Papaya seeds on quantitative platelets count in female rabbits. **Place and Duration of Study:** Animal House, Department of Pharmacology and Therapeutics, at PUMHSW-SBA from Feb 2018 to March 2018.

Methodology: For this study thirty adult and healthy female rabbits were selected and subdivided into two groups, Group A (Control) n=15, given only fresh hay & water and Group B (study) n=15, given papaya seeds powder as dose of 500mg once a day along with fresh hay & water provided *ad libitum*, then blood tests for platelets count were performed on Day 0, 15, 30,45& 60 to observe the effects of papaya seeds on quantitative platelets count.

Results: Non-significant increase seen in platelets count in Group-B (study) up to 15th day of study. **Conclusion**: Papaya seeds having the properties of increasing the count of platelets but can be used for limited time. Further sophisticated scientific research is required to evaluate the platelets increasing properties of Papaya seeds.

Key words: Papaya seeds, Platelets, Female Rabbits

1. Senior Lecturer Pharmacology, PUMHSW, Nawabshah.
2. Senior Lecturer Pharmacology, PUMHSW, Nawabshah.
3. Assistant Prof : Pharmacology Dept, PUMHSW-Nawabshah.
4. Prof : Pharmacology Dept, PUMHSW-Nawabshah.
5. Professor of Pharmacology, Dow Medical University, Karachi.
6. Assistant Prof , Community Medicine, PUMHSW-Nawabshah.

Correspondence author: Masood Ahmed[1] Senior Lecturer Pharmacology, PUMHSW, Nawabshah. Email: **fastmasood7@gmail.com**

Citation: Unar MA , Memon F , Irum N, Dahri G M, Mughal A, Kumar G. Papaya Seeds: Their Effects On Quantitative Platetlets Count In Female Rabbits.JPUMHS;jan-mar 2020 10(1),47-53.

INTRODUCTION

About 500,000 plants are on our earth, having identified. Out of them, 10,000 have been used regularly for medicinal and nutritional purposes. Among them, Papaya also has large medicinal and nutritional values.[1] Papaya belongs to Caricaceae Family; its botanical name is Carica Papaya, in Pakistan called *papeeta*. Papaya is largely cultivated in India and South America and also in Punjab and Sindh provinces of Pakistan, but on a small agricultural area.[2] The fruit usually contains many black to brownish colored seeds in b/w sweet and different colored flash according to variety of papaya specie.[2] In folklore therapies of different diseases, Papaya is commonly used in the treatment of chronic indigestion, fever, boils, and hypertension. Also used as an antioxidant. Papaya having properties of

anticancer, anti-dengue, anti-fungal, anti-ulcer, anti-HIV, anti-malarial and also been used for the management of diabetes and other diseases.[2]

Lot of studies has been done on papaya leaf, seeds and stem for management of treating the low platelets count in dengue fever. A mosquito (Aedesaegypti) causes a viral disease known asDengue fever (DF).This virus (Flavivirus genus*)* has 04 types which are closely related virus serotypes named (DENV-1, 2, 3 and 4). The all serotypes are of dengue virus affects mostly the adults and children but the virulence of type may be variable.[3]

This virus has affected lot of the population worldwide round about hundred states in Asia, Africa, Australia, America, caused more ailment and demise than some other arthropod-borne infection in people. Significant weight has been seen in south East Asian and western pacific nations with disturbing markers of endemic spread of this malady globally.4Dengue fever appears with sudden onset of fever with shivering, severe bone pain, like breakbone, sore throat, dizziness rash, headache and increasingly serious clinical highlights including stomach torment, bleedings, organ disability, hematological deviations, thrombocytopenia, and plasma spillage. In extreme cases these side effects show up as Dengue Hemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS) are increasingly deadly and separated by high fever, dying, thrombocytopenia and hemoconcentration.[3]

Treatment is majorly conservative like antipyretics, i/v fluids, antiemetics and monitoring platelets level. one tetravalent formulated French made Sanofi branded vaccine *Dengvaxia vaccine* (CYD-TDV) is available for prevention. This is the main dengue antibody (authorized), presented in Mexico in December 2015 for use in people 9 to 45 years old living in built up zones, as this vaccine is not available in most of the countries, so the conventional methods of therapy are applied including, whole blood transfusion, transfusion of fresh frozen plasma (FFP) and self-limiting nature of this viral disease.[5]

Platelets are coursing little circle type cells they assume significant job in procedure of hemostasis6.The typical scope of platelets is 150,000 to 350,000/cmm. Platelets act in the reaction of vascular injury and make cluster and structure work to forestall the further loss of blood their layers contain different receptors for collagen, ADP, vessel divider von Willebrand factor and fibrinogen. The cytoplasm of platelets contains actin, myosin, lysosome, and 2 sorts of granules (A) Dense Bodies, which contain the non-protein substances that are released in light of platelets initiation, including serotonin a synapse, ADP a totaling operator and other adenine nucleotides. (B) Alpha granules or thick bodies, which contain discharged proteins.These proteins incorporate coagulating variables and platelet-determined development factors. At the point when a vein divider is harmed, platelets cling to uncovered collagen a von Willebrand factor (vWF) in the divider and structure a hemostatic attachment and secure the hemorrhagic points.[7] When the platelets count is low, clot retraction is deficient and there is constriction of damaged vessels then clinical syndrome appears called as thrombocytopenic purpura, characterized by easy bruising, multiple subcutaneous hemorrhages mostly seen in children up to the age of 6

years. When platelets number exceeds the upper normal limit it is called thrombocytosis and it is associated with increase the risk of thrombosis. Mutation of targeting hematopoietic cells, for example, THPO, JAK2 or MPL can cause inherited or acquired Primary thrombocytosis. While secondary thrombocytosis is due to external factors such as chronic renal failure, chronic inflammation or cancer.[8]

Papaya plant and all other its parts, like fruit, latex, leaves, seeds having the properties of increasing the platelet count.

MATERIALS AND METHODS

This observational examination was led on solid creature model utilizing female hares in creature house at Peoples University of Medical and Health Sciences Nawabshah for 60 days from Feb to March 2018. Thirty solid grown-up female hares were chosen by applying consideration criteria like; Healthy grown-up female hares, Age between 16 two years, Weight between 1.5-3 kg and same race/kind. What's more, avoidance criteria including; male or child hares, pregnant, underweight and various races. Information was gathered after endorsement of rundown and authorization of moral council.

Test Preparation:

The Seeds of Papaya:The crisp seeds were bought from the nearby market. Seeds were altogether washed with crisp water. At that point seeds were dried at room temperature for about fourteen days, dried seeds pounded into fine powder by utilizing a household electric processor. At that point powder was stuffed into little plastic envelopes subsequent to estimating on Electric Digital parity Chyo (Model, Mk-60E, Japan) and bundles were put away at room temperature. So with the end goal of this examination, estimated amount of papaya seed powder was feed as 500mg once per day.

Test Administration: In the aseptic climate and dealing with extraordinary consideration and playing it safe of any possibility of gnawing from hare. Effectively estimated seeds powder was blended at first with 10 cc plain faucet water and in this way regulated legitimately into oral depression of hare by help of taking care of syringe and oral hole was analyzed for deglutition.

Creature Model: Healthy grown-up female bunnies of 16 two years old enough having 1.5-3 kg weight was utilized for study reason. The creatures were kept and kept up under standard state of very much circulated air through room temperature of 30co, light/dull pattern of 12 hours of the day. Thirty bunnies were haphazardly similarly separated into two gatherings A (control bunch n=15 creatures) were feed just new feed and water and B (study bunch n=15 creatures) were feed 500 mg of papaya seed powder once day by day alongside new feed and water. Creature models were set apart with singular number of distinguishing proof with assistance of indelible marker for simple ID of each hare.

Timetable For Blood Sample Collection: The blood tests were attracted an arranged uniform level, first perusing at zero time called day 0 accordingly tests were drawn at fortnightly at 15,30,45 and 60 days and

were sent to Diagnostic Laboratory at PUMHS Nawabshah.

Blood Extraction And Laboratory Analysis: Blood tests were drawn through clear venipuncture from bunny ear, utilizing the enormous vessel. The blood was moved into alluring holder containing anticoagulant (EDTA) for platelets check. Platelets check was estimated by utilizing (Nihan kohden Mek-6420 k) machine.

Information Analysis: The information have been communicated as mean ± SD everything being equal and measurements were evaluated by understudy's t-test and by utilizing SPSS form 19.0 (IBM, consolidation, USA). The information has been introduced as tables, outlines and graphs.A likelihood of $p<0.05$ was viewed as noteworthy.

Result: An incremental trend and slightly increased percentage of (1.35%) seen in platelets count from baselineto Day-15 (p value 0.300) (Table: 1), Then gradual decrease in levels seen (p value 0.094) see (Bar chart 1).

Table 1: shows the Platelet count from Day-0 to Day-60, of Group-A (control) and Group-B (Study). Nonsignificant increment observed from Day-0 to Day-15(p-0.300) in Group-B.

DISCUSSION

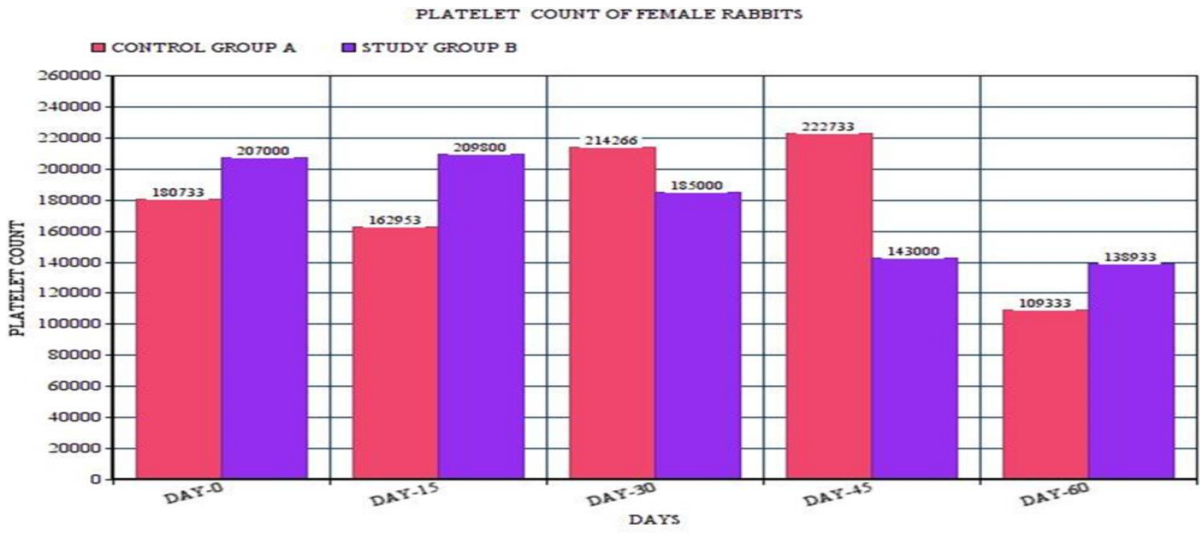
Various studies have been done worldwide on papaya, but in Pakistan, the research on papaya fruit, seeds and its various parts has not been done so much & efficient way, that we can establish its merits and demerits on the consumption of various parts of Papaya plant.

A study was conducted at Karachi on healthy adult rabbits showed an increase in the Platelet level of 19.2%, 65.5% on 250mg and 500mg/day respectively. Papaya's seeds powder increased platelet count in few days and may impart a significant medicinal value in dengue fever (DF) and in thrombocytopenia.[9] Lot of studies have been done on papaya leaf extracts which shows the better improvement in platelets count than seeds as a study at university of Punjab Lahore, showing that after seven days of administration of Papaya leaf formulation in animal models, this formulation caused a significant increment in total thrombocyte count, also increment in blood absolute values with ($p<0.05$) of the treated in comparison with controls.[10]

Nwaangwa EK et al revealed that CP seed concentrate may have a stimulatory impact on haematopoeisis which may have come about because of the presence of bioactive and Vitamins components of its phytochemistry, in this study they observe the dose dependent increase of all hematological parameters with p-value <0.05. They also observed the decrease in the total body weight of the rats.[11]In our study non-significant increase of platelets seen from 207000 ± 20155.5 on day 0 to 209800 ± 3221.58 on day 15(1.35% increment) in study group.[11]

Ravindra B. Malabadi in his study suggested that, Carica papaya leaf concentrate could be utilized as an extra or as a reciprocal herbal medication in intense febrile illness. As this extract has antiviral properties so in patients with thrombocytopenia on optimum dose, accelerated the count of platelets.

Platelets count/cmm	Group-A (Control) Mean Standard Deviation	Group-B (study) Mean Standard Deviation	p-value
Day-0	180733 ± 31924.5	207000 ± 20155.5	0.492
Day-15	162953 ± 30517.43	209800 ± 3221.58	0.300
Day-30	214266 ± 32794.96	185000 ± 31473.19	0.525
Day-45	222733 ± 34194.61	143000 ± 30662.37	0.094
Day-60	109333 ± 7709.40	138933± 14165.51	0.094



Bar Chart 1: Platelets count from Day-0 to Day-60.

He further suggests the use of papaya leaves extract as an oral initial treatment for dengue fever and he thinks that there is possibility of invention of a vaccine from papaya for DF.[12] His study demonstrated that oral administration of extract of Carica papaya leaves is said to have a good pharmacological impact on thrombocyte count. A 23-year- young man was administered a calculated dose for five days. Blood CP tests were done prior to administration of extract and after the taking of leaves juice. The count of platelets showed an increase of total cells from initial 28000/micro liter to 138000/micro liter at the end of five days.[12]

A study at University of Calabar, Nigeria showed that ethanol extract of seeds of papaya effected significantly with a p-value less than 0.05 over improved the selected blood parameters (Hb, RBCs, PCV, WBC and Platelets) of rats, due to the presence of different variants of bioactive compounds in the seeds.[13] Research on murine model also showed increment in platelets count. The platelet count in the test group started to increase significantly from Day 3 (3.4±0.18×105/µL), reaching almost a fourfold higher at Day 21 (11.3×105/µL), while it was 3.8×105/µL and 5.5×105/µL at Day 3 and Day 21 respectively in the control[14].

A study on papaya seeds showed that considerable total platelet count has showed an increment of 3.7% on dose of 250 mg compared to control valuei.e.455±39.5unit. The all-encompassing dose of 500 mg demonstrated 6.8% platelet count increase.[13]

CONCLUSION

C. papaya seeds have tendency to increase the platelets count could be used as an additional or as a complementary agent where platelet count increment is required but can be administered for a short period.

RECOMMENDATION

In general, the papaya seeds have the promising potentials to alleviate the hematological and nutritional disorders. So it is recommended that in vivo studies should be done on humans to establish the merits of papaya seeds, and find the new avenues of treatment options for various diseases.

REFERENCES

1. T.SusanSrujana1,KonduriRaveendraBabu, BodavulaSamba and Siva Rao. Phytochemical Investigation and Biological Activity of Leaves Extract of Plant BoswelliaSerrata. The pharma journal.2012; 1 (5): 22-46.
2. Arvind. G, Debit Bhowmik,Duraivel S,Harish G. Traditional,and Medicinal uses of Carica papaya. Journal of Medicinal Plants studies.2013; 1 (1):7-15
3. Byron E. E. Martina, Penelope Koraka, and Albert D. M. E. Osterhaus. Dengue Virus Pathogenesis: an Integrated View. Clinical Microbiology Review. 2009; 22 (4): 564–581.
4. Chawla Pooja, Yadav Amrita, Chawla Viney. Clinical implications and treatment of dengue. Asian Pacific Journal of Tropical Medicine. 2014: 169-178.
5. Immunization, vaccines and Biologicals. [available from] http://www.who.int/immunization/research/development/dengue_vaccines/en.

6. Kim E.Barrett, Susan M.Barman, Scott Boitano et al. Ganong' review of Medical Physiology.25th edition. McGraw Hill Education. 2016: 69-70.
7. Hoylaerts MF. Platelet-vessel wall interactions in thrombosis and restenosis role of von Willebrand factor. Verh K Acad Geneeskd Belg. 1997;59 (3):161-83.
8. Nicole Kucine, Katherine M. Chastain, Michelle B. Mahler and James B. Bussel1. Primary thrombocytosis in children. Haematologica. 2014; 99(4): 620-628.
9. Asadullah, Asif Ahmed and Farhat Jehan. Medicinal role of papaya seeds on thrombocyte count tested on healthy rabbits. Journal Of Pakistan Medical Association. 2017; 67(5): 785-787.
10. Nadeem sheikh, Neelam Younas, and Mohsin Shafiq. real Administration of Papaya Leaf Extract Leads to Increase in PLT Count. Pharmacognosy Journal. 2011; 60(1):139-142.
11. Nwaangwa EK, Okoye E1, and Ugoji AE. A Study of Haemato-Stimulatory Effects of Graded Dose Of Aqueous Carica Papaya Seed Extract In Wistar Rats Research journal of pharmaceutical, biological and chemical sciences. 2013; 4 (1):129-135.
12. Ravindra B. Malabadi, Raju K. Chalannavar, Supriya S et al. Dengue Virus Disease: Current Updates on the use of Carica Papaya Leaf Extract as a Potential Herbal Medicine. International Journal of Research and Scientific Innovation (IJRSI). 2017; 4(8): 36-50.
13. Ikpeme EV, Ekaluo UB, Kooffreh ME, Udensi. Phytochemistry and hematological potential of ethanol seed leaf and pulp extracts of Carica papaya (Linn). Pak J Biol Sci. 2011;15,14 (6):408-11.
14. Dharmarathna SLCA, Wickramasinghe S, Waduge RN, Rajapakse RPVJ, Kularatne SAM. Does Carica papaya leaf-extract increase the platelet count? An experimental study in a murine model. Asian Pacific Journal of Tropical Biomedicine. 2013; 3(9):720-724.