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"EVALUATION OF THROMBOLYTIC ACTIVITY IN VARIOUS PARTS OF PAPAYA PLANT"

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ABSTRACT

The objective of this present research study was to investigate the thrombolytic activity of aqueous extract of Carica papaya plant (root, seed and leaf) parts. Streptokinase was used as a positive control. The human blood was taken as test sample. The mean % of clot lysis for streptokinase was 36.44%. Similarly, the root, seed and leaf extracts of Carica papaya showed the mean % of clot lysis as 24.70%, 24.29% and 23.67% respectively.

KEYWORDS: aqueous extract, carica papaya, control, streptokinase, thrombolytic activity.

INTRODUCTION

Thrombolysis, also known as thrombolytic therapy, is a treatment to dissolve dangerous clots[1-2] in blood vessels, improve blood flow, and prevent damage to tissues and organs. Thrombolysis may involve the injection of clot-busting drugs through an intravenous (IV) line or through a long catheter that delivers drugs directly to the site of the blockage. It also may involve the use of a long catheter with a mechanical device attached to the tip that either removes the clot or physically breaks it up.

Thrombolysis is often used as an emergency treatment[3] to dissolve blood clots that form in arteries feeding the heart and brain, the main cause of heart attacks and ischemic strokes -- and in the arteries of the lungs (acute pulmonary embolism).

If a blood clot is determined to be life threatening, thrombolysis may be an option if initiated as soon as possible-ideally within one to two hours-after the onset of symptoms of a heart attack, stroke, or pulmonary embolism (once a diagnosis has been made). For more than five decades, anticoagulant drugs[4-5] consisting of heparins, vitamin K antagonists, and their

derivatives have been the major players in the clinical setting. Although it is well established that aspirin is one of the antithrombotic agent which still provides an effective secondary prevention of ischemic cardiovascular disorders, this drug can produce hemorrhagic events and upper gastrointestinal bleeding as major drawbacks. During the past decade, several trials have led to an effort in the search for novel compounds or sources to suppress the platelet aggregation.

Throughout history, plants have been used as a major medicinal source, with interest in herbal formulations[6-7] increasing globally over the past decade. In addition, extracts of natural products[8-9] provide a useful source of bioactive compounds which can be developed as drugs directly or provide novel structural templates. Today, large proportion of drugs in clinical use are produced by the synthesis of natural products and/or their derivatives, and new plant- derived medicines are continually being discovered. For this reason the leaves and/or twigs, stem, bark and underground parts[10-11] of plants are most often used for traditional medicines. Papaya is a plant which is having thrombolytic activity. The Objective of research was to determine the thrombolytic activity of Papaya & comparing the activities of various parts like root, seed & leaf by comparing with the streptokinase.

METHODOLOGY

1. Collection of various parts

Various parts like roots, seeds & leaves of Carica papaya were collected from Nalgonda district, Telangana, India.

2. Preparation of aqueous extract of Carica papaya

Fresh different parts of Carica papaya plants were collected and washed properly with distilled water. The plants were divided into root, seed and leaf sections, were shade dried at room temperature for 15 days. Dried parts were uniformly grinded using mechanical grinder. The dried powder of plant material was extracted in distilled water.

10 gram of ground plant material was soaked in 100ml of distilled water in a round bottom flask and loaded in the heating mantle at a temperature of 65-70°C for 15 minutes. After15 min reduces the temperature to 30-40°C and allowed it for 1hour. Then the mixture was filtered using whatmann filter paper number 1. Thus each ground papaya plant materials were extracted separately. The dried extracts were weighed and stored in air tight container with necessary markings for identification and kept in refrigerator at 0-4°C.

3. Collection of Blood sample

Whole blood (3ml) was drawn from healthy human person without a history of oral contraceptive or anticoagulant therapy. From which 500µl (0.5ml) of blood was transferred to each of the previously weighed micro centrifuge tubes to form clots.

4. Procedure for clot lysis

3ml venous blood drawn from healthy volunteers and was distributed in five different labelled, pre weighed sterile micro centrifuge tube (0.5ml/tube) and incubated at 37°C for 45 minutes. After clot formation, serum was completely removed without disturbing the clot using micro pipette and each tube having clot was again weighed to determine the total clot weight (clot weight = weight of clot containing tube - weight of tube alone) of the person. To first micro centrifuge tube containing pre weighed clot, 100µl of leaf extract of Carica papaya was added. Similarly, to the second micro centrifuge tube, 100µl of root extract of papaya plant was added. To third micro centrifuge containing blood clot, 100µl of seed extract of papaya was added individually. As a positive thrombolytic control, 100µl of streptokinase was added to the control tube numbered.

All the tubes were then incubated at 37°C for 90 minutes and observed for clot lysis. After incubation, fluid released was removed and tubes were again weighed to observe the difference in weight after clot disruption. Difference obtained in weight taken before and after clot lysis was expressed as percentage of clot lysis.

% of clot lysis = (wt. of released clot /clot wt.) × 100

= (WR/WC) × 100

W1 = weight of empty eppendrof

W2 = weight of eppendrof with clot

WC = W2 - W1

W3 = weight of eppendrof after lysis

WR = W3 - W2

RESULTS

Thrombolytic activity of aqueous crude extracts of Papaya.

Name of Extract	Weight of empty Eppendrof (W1) gm	Weight of Eppendrofwith clot (W2) gm	Weight of clot (W2-W1)gm	Weight of Eppendrof after clot lysis(W3)gm	Weight of released clot (W2-W3)gm	% of Clotlysis
Streptokinase	1.033	1.738	0.705	1.475	0.263	37.3%
Papaya Root	1.033	1.663	0.614	1.468	0.179	29.15%
Papaya leaf	1.033	1.656	0.623	1.491	0.165	26.48%
Papaya seed	1.033	1.674	0.641	1.499	0.175	27.30%

DISCUSSION

Streptokinase is used as standard thrombolytic agent. The clot lysis by streptokinase is 37.30%. Aqueous crude extracts of root, leaf & seed of papaya have exhibited 29.15%, 26.48%, 27.30% of clot lysis respectively.

CONCLUSION

The thrombolytic activity of various parts like root, seed & leaf of Papaya plant was observed by determining the percentage of clot lysis. From the results, it was concluded that the activity of root is more than seed and leaf.

The order of Thrombolytic activity of various parts of Papaya: Root >seed>leaf.

BIBLIOGRAPHY

1. D. B. Baruah, R. N. Dash, M. R. Chaudhari, and S. S. Kadam, “Plasminogen activators: A comparison,” Vascular pharmacology, 2006; 44(1): 1–9.
2. S. A. Rouf, M. Moo-Young, and Y. Chisti, “Tissue plasminogen activator: characteristics, applications and production technology,” Biotechnology Advances, 1996; 4(3): 239–266.
3. S. C. Patel, and A. Mody, “Cerebral hemorrhagic complications of thrombolytic therapy,” Progress in Cardiovascular Diseases, 1999; 42(3): 217–233.
4. J.C. Mucklow, “Thrombolytic treatment streptokinase is more economical than Alteplase,” Bitrish Medicine Journal, 1995; 311: 7018, 1506.
5. D. Collen, “Coronary thrombosis: streptokinase or recombinant tissue- type plasminogen activator,” Annals of internal medicine, 1990; 112(7): 529–538.
6. Harvey AL, Edrada-Ebel R, Quinn RJ. The re-emergence of natural products for drug discovery in the genomics era. Nat Rev Drug Discov., 2015; 14(2): 111-29.

7. Islam A, Fahmida A, Khalil I, Sasongko TH, Gan SH. Natural Products Towards the Discovery of Potential Future Antithrombotic Drugs. Curr Pharm Design., 2016; 22(20): 2926-46.
8. A. Das, S. M.R. Dewan, R. Ali, P.C. Debnath, and M. Billah, "Investigation of in vitro thrombolytic potential of ethanolic extract of Momordica charantia fruits: An anti-diabetic medicinal plant," Der Pharmacia Sinica, 2013; 4(2): 104-108.
9. Ramjan A, Hossain M, Runa JF, Md H, Mahmodul I. Evaluation of thrombolytic potential of three medicinal plants available in Bangladesh, as a potent source of thrombolytic compounds. Avicenna J Phytomed. 2014; 4(6): 430-6.
10. Khatun A, Chowdhury UK, Jahan A, Rahman M. Cytotoxic and thrombolytic activity of the aerial diurnum L.(Solanaceae). Pharmacology Online. 2014; 1: 109-113.
11. Yadav, AS. and Bhatnagar, D. Inhibition of iron induced lipid peroxidation and antioxidant activity of Indian spices and Acacia in vitro. Plant foods Hum. Nutr. Mar. 2010; 65: 18 –24.