



Thrombolytic activity of Gandhaga Karuppu - Invitro Study

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ABSTRACT

BACKGROUND

Cerebral Infarction is the major cause of Hemiplegia. It occurs due to thrombosis and embolism. Thrombolytic therapy also known as clot busting drug is used in the clinical area to treat Venous and Arterial thromboembolic events. Commonly used thrombolytics are Streptokinase, Urokinase, Tissue Plasminogen Activator to dissolve the clots. Since thrombolytic agents are not in affordable cost, I have started to look for an alternate Medicine. The present study is aimed to investigate the In vitro Thrombolytic activity of *Gandhaga Karuppu* in Healthy Human Blood Sample.

OBJECTIVES

To Evaluate the Thrombolytic activity of Herbo-mineral formulation of "*Gandhaga Karuppu*"

MATERIALS AND METHODS

The Ingredients used in the preparation of *Nellikai Gandhagam* (Sulphur), *Chukku* (Dried Ginger), *Milagu* (Black Pepper) and *Thippili* (Long Pepper). The trial drug was prepared as per *Siddha* Literature, *Kannusamy Parambarai Vaithiyam* Pg.No.442. The Thrombolytic activity of *Gandhaga Karuppu* was evaluated using Healthy Human Blood Sample.

RESULT

The in vitro study revealed that *Gandhaga Karuppu* showed 32.70% of Thrombolytic activity.

CONCLUSION

The Present study proposes that the test drug "*Gandhaga Karuppu*" has moderate thrombolytic activity. Thus the formulation may be a source of effective herbo-mineral *Siddha* formulation.

Keywords:

Thrombolytic activity, Thrombolytics, Gandhaga Karuppu.

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INTRODUCTION

Human beings possess inbuilt system by which the blood remains in the fluid state normally and guards against the hazards of thrombosis and haemorrhage. Virchow Triad described three primary events which predispose to thrombus formation viz; endothelial injury, altered blood flow and hypercoagulability of blood. Along with this, the activation of Platelets and Clotting System occur. Thrombus activates the fibrinolytic system with consequent release of Plasmin which may dissolve the thrombus completely result in resolution. Usually lysis is complete in small venous thrombi; while large thrombi may not be dissolved. If the thrombus is not removed, it starts getting organized due to more and more deposition from the constituents of flowing blood ultimately cause obstruction of some important blood vessels. Thrombus developed in the circulatory system due to failure of haemostasis causes vascular blockage and leads to serious consequences such as acute Myocardial Infarction and Stroke. Stroke and Heart Attacks are the major causes of morbidity and mortality in the developed countries. Thrombolytic agents used to dissolve the clot and in the management of thrombosis in patients. Thrombolytic agents such as Tissue Plasminogen activator, Urokinase and Streptokinase are used all over the world for the treatment but their use is associated with high risk of Haemorrhage, Anaphylactic reaction and lack of Specificity. Therefore, in recent years research is focused on Traditional herbal medicines which have antiplatelet, anticoagulant and thrombolytic activity. The present study has been aimed to evaluate the in vitro Thrombolytic activity of *Gandhaga Karuppu*.

MATERIALS AND METHODS:

Collection of Raw drugs:

Nellikai Gandhagam was bought from *Gopalan aasaan* shop, Nagarkovil at Kanyakumari district, Tamilnadu.

Other raw drugs were bought from *Vallalar naatu maruthu kadai*, Tirunelveli Town, Tamilnadu

METHOD OF PREPARATION:

The purified *Chukku*, *Milagu*, *Thippili* were made into a powder (*chooranam*) individually and filtered by using sieve (80-100 meshes). Half of the above powder is placed in a mud plate

(*Agal*) and then the entire quantity of purified *Gandhagam* is placed over the above powder and then the remaining powder (*chooranam*) is spread over the *Gandhagam*. This mud plate (*Agal*) was covered with another suitable mud plate (*Agal*) and then sealed with clay soaked cloth and made into seven layers. The entire setup was subjected into incineration process by using 15 dried cow dung cakes. After cooling, the final product obtained is black in colour was collected and grind well. The prepared medicine was stored in a air tight container.

SHELF LIFE:

5 years.

DOSAGE:

Kundri edai – 130mg daily for 6 to 7 days.

ADJUVANT:

Honey, Ghee

INDICATIONS:

Fever, Jaundice, Hemiplegia, Muscle cramps, Radiating Pain, *Megavayu*, Fever with delirium and Breast Milk Congestion.

PATHIYAM:

Avoid Tamarind and sexual indulgence

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Kannusamy Parambarai Vaithiyam Pg.No.442, Fifth Edition -2006.

PHARMACOLOGICAL ANALYSIS:

THROMBOLYTIC ACTIVITY OF *GANDHAGA KARUPPU*

Reagents and Chemicals:

Streptokinase (SK) vials of 15,00,000 I.U.10 blood (5ml) sample drawn from healthy human volunteers, *Gandhaga Karuppu*, Distilled Water.

Apparatus

Micro centrifuge tube (0.5ml/tube), Micropipette, Vortex mixer, 0.22-micron syringe filter, Beaker, Electric Balance, Incubator.

Experimental procedure:

Specimen:

Whole blood (5 ml) was drawn from healthy human volunteers (n=10) without a history of oral contraceptive or anticoagulant therapy. 500 µl of blood was transferred to each of the ten previously weighed alpine tubes to form clots.

Table 1. “Ingredients of *Gandhaga Karuppu*” is a herbo-mineral formulation

Tamil name	English Name	Scientific Name	Group/Family	Quantity
<i>Nellikai Gandhagam</i>	Sulphur	Sulphur	Non-metal (Oxygen Group)	175gms (5 palam)
<i>Chukku</i>	Dried Ginger	<i>Zingiber officinale</i>	Zingiberaceae	350gms (10 palam)
<i>Milagu</i>	Black Pepper	<i>Piper nigrum</i>	Piperaceae	17.5 gms (½ palam)
<i>Thippili</i>	Long Pepper	<i>Piper longum</i>	Piperaceae	17.5gms (½ palam)

Table:1 Average percentage of clot lysis effect of GK

NO	WEIGHT OF THE EMPTY TUBE [A]gm	WEIGHT OF TUBE WITH CLOT [B]gm	WEIGHT CLOT [C] C=B -A	WEIGHT OF THE TUBE WITH CLOT AFTER LYSIS [D]gm	WEIGHT OF LYSIS [E][B-D]	% OF CLOT LYSIS E/C x 100	AVERAGE % OF CLOT LYSIS
1	0.82	1.11	0.28	1.04	0.07	25	
2	0.84	1.13	0.29	1.06	0.07	24.13	
3	0.84	1.14	0.3	1.0	0.1	33.33	
4	0.79	1.20	0.41	1.10	0.1	24.39	
5	0.81	1.16	0.35	1.00	0.16	45.71	32.72
6	0.83	1.28	0.45	1.01	0.27	60	
7	0.76	1.19	0.43	1.08	0.11	25.58	
8	0.78	1.21	0.43	1.13	0.08	18.60	
9	0.79	1.23	0.44	1.04	0.19	43.18	
10	0.82	1.30	0.48	1.17	0.13	27.08	

Table No:2 Effect of GK on clot lysis formulation

Blood sample	Control (water)	Streptokinase	% of Clot lysis Formulation
1.	3.18	70.32	25.00
2.	3.37	70.55	24.13
3.	3.58	71.32	33.33
4.	3.62	71.86	24.39
5.	3.77	72.13	45.71
6.	3.91	72.18	60.00
7.	4.05	72.55	25.58
8.	4.13	73.56	18.60
9.	4.20	73.89	43.18
10.	4.22	74.28	27.08
Mean	3.80 %	72.264	32.72%

Figure:1 Effect of GK on clot lysis formulation

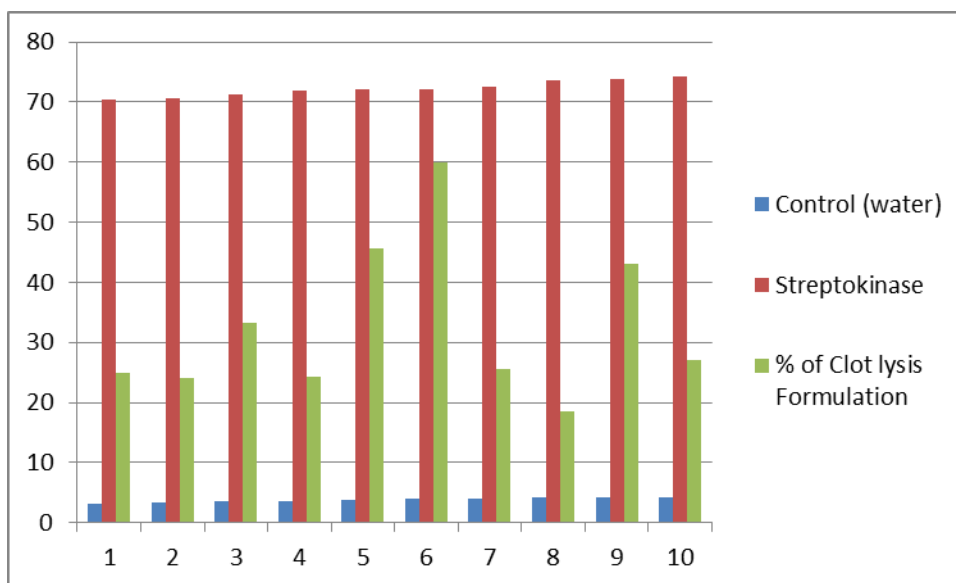


Table No:3 Group statistics (Control Vs Streptokinase)

	Control& Streptoki-	N	Mean	Std. Devia-tion	Std. Error Mean
% of Clot Iysis	Control Strep-tokinase	10 10	3.802	0.12039	0.0380

Table No:4 Group statistics (Control Vs Formulation(GK))

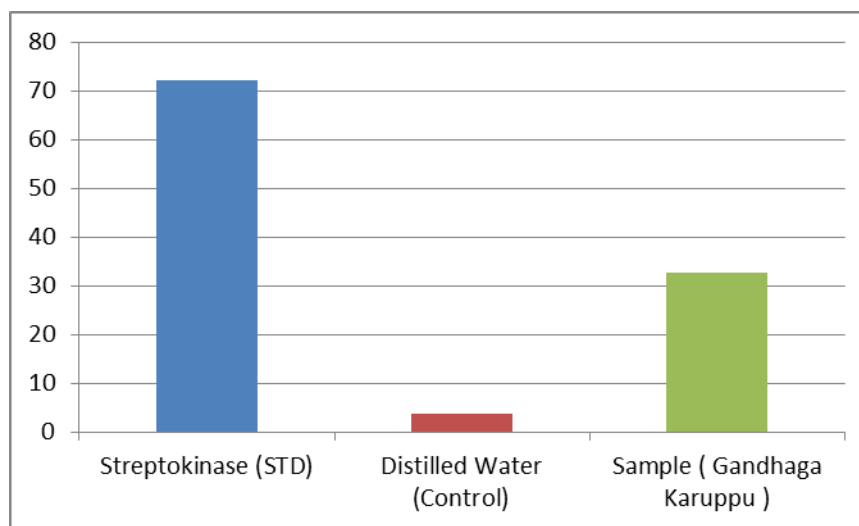
	Control& Formula-	N	Mean	Std. Devia-tion	Std. Error Mean
% of Clot Iysis	Control For-mulation	10 10	3.802	0.12039	0.0380

Table No:5 Group statistics (Formulation(GK) Vs Streptokinase)

	Formula-tion&	N	Mean	Std. Devia-tion	Std. Error Mean
% of Clot Iysis	Streptokinase Formulation	10 10	72.264	0.44776	0.14169

Table No:6 Effect of clot lysis

Sample	Result%
Streptokinase (STD)	72.26.1
Distilled Water (Control)	3.80.1
Sample (Gandhaga Karuppu)	32.701

Figure:2 Effect of clot lysis

DISCUSSION

The present study was undertaken to evaluate the thrombolytic activity of *Gandhaga Karuppu*. In the thrombolytic bioassay result suggested that the *Gandhaga Karuppu* showed very significant activity. The *Gandhaga Karuppu* can be evaluated to further research for thrombolytic activity to a specific disease.

Atherosclerosis-induced heart attacks and strokes are leading reasons of morbidity and mortality. Current essential and auxiliary prevention strategies emphasize control of different atherosclerotic danger components, including smoking, hypertension, hypercholesterolemia, diabetes mellitus, weight, irritation, and homocysteine. Current pharmacological studies recommend remedial estimations of these natural preparations, including lowering of blood pressure and lipids, anti-oxidation, thrombolytic activity and the promotion of microcirculation. There is a requirement for more goal and scientific approaches to authenticate individual herbs to identify chemical constituents, detect adulteration or contamination of herbs, and screen the quality of herbs and herbal medicines. There is also a need to check the consistency of different batches of herbs utilized as a part of this study and to distinguish bioactive parts in herbs reported to have physiological effects.

CONCLUSION

Under this study, Test drug *Gandhaga Karuppu* of demonstrated moderate ($P < 0.001$) clot lytic properties in different blood samples. The percent clot lytic activity was compared with water (Negative control) and standard enzyme streptokinase (positive control). The mean % of clot lysis for water and streptokinase was found to be 3.8% and 72% separately. The mean percent clot lytic activity of Test drug *Gandhaga Karuppu* was found to be 31.60%, which is significant compare with the positive and negative control. So, the present research proposes that, the Test drug *Gandhaga Karuppu* has moderate thrombolytic activity. Thus the formulation may be a source of effective herbo-mineral drug.

CONFLICT OF INTEREST: None declared

SOURCE OF FUNDING: Nil

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