"EFFECT OF SWARNA VANGA ON MADHUMEHA IN ALBINO RATS"

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ABSTRACT: *In this study on "Madhumeha" (Prameha) the authors discuss of minerlometallic preparations and its effect either as curative or as palliative measures in Prameha.*

INTRODUCTION

Besides herbal drugs, many a number of mineralo-metallic preparations are claimed to be effective either as curative or as palliative measures in Pramehas. In the present context we mean Madhumeha by the term prameha.

Swarna Vanga, a mosaic gold like Ayurveda preparation has been claimed to be effective in Pramehas since its introduction into the Ayurvedic Therapeutics i.e. from18th century A. D. onwards.

It is said to be bitter in taste and such bitter substances are generally claimed to be effective in pramehas by pacifying (vata and destroying kapha. Incidentally Madhumeha is one of the sub types of vatic pramehas; hence, in this, Vata is more predominating than kapha, though the pramehas are kapha dominated in general.

Keeping these points in view and also the claims of ancient Ayurvedic seers we have undertaken this study to assess the hypoglycaemic action of Swarna Vanga in four different doses on normogly-caemic and hyperglycaemic albino rats.

Efforts were also made to study its prophylactic effect against alloxan induced diabetes in experimental animals.

MATERIAL AND METHODS.

Swarna Vanga prepared with half mercury was selected for this study.

The chemicals required for blood sugar estimation and preparation of drug suspension are –

a) Sodium Tungastate – 10%
b) Sulphuric Acid – 0.67N
c) Alk. Copper Sulphate –
d) Phospho Molybdic Acid –
e) Alloxan
f) Insulin
g) Glucose
h) Gumacacia.

All the chemicals are of B. D. H. company A. R. group.

Borosil glasswares were used and readings were recorded in systronics photoelectric calorimeter.

Healthy adult albino rats of either sex weighing 100-150 gm. were procured from central animal house I. M. S., B. H. U.

The animals were allowed to acclamatise to he laboratory environment before starting the experiment. The animals were given normal laboratory diet and water ad-libitum.

In normoglycaemic study, diet was allowed till the starting of the experiment and in the diabetic experiments diet was withdrawn before 18 hrs. of induction of diabetes. During fast only water was allowed ad-libitum.

Preparation of Drug Suspension

Drug was made a suspension in 20 % Gum-acacia solution, given orally through '0' catheter and only gum-acacia solution was given to the controls.

Diabetes was induced by using alloxan following the usual method described by Leukens F. O.W. (1948).

Blood was collected in a wax block by puncturing the para orbital venous plexus with a thickish glass capillary. No anticoagulant was added.

Blood sugar was estimated by Folinswu method.

Normo Glyeaemic Study.

Forty albino rats were taken and grouped into four batches. Again each batch was subdivided into the two groups consisting 5 animals in each and housed in separate cages. One group was labeled as controls while other as treated. The treated group of each batch received 0.1; 0.25; 0.5 and 1gm/kg body weight doses, orally in suspension form. Control group was given only 20% gum-acacia solution.

The blood was collected at initial 'O' hours and after 1st, 3rd and 6th hours of drug administration.

After suitable intervals (7days) the groups were reversed i.e. the previous control group was given the drug and treated group served as control. Thus the total numbers of animals assessed experimentally are 80.

The results are shown in Table No. I. Fig. 1.

Fig. 1: Effect of *swarna vanga* (in different doses) on Blood Sugar of Normal Albino Rats.
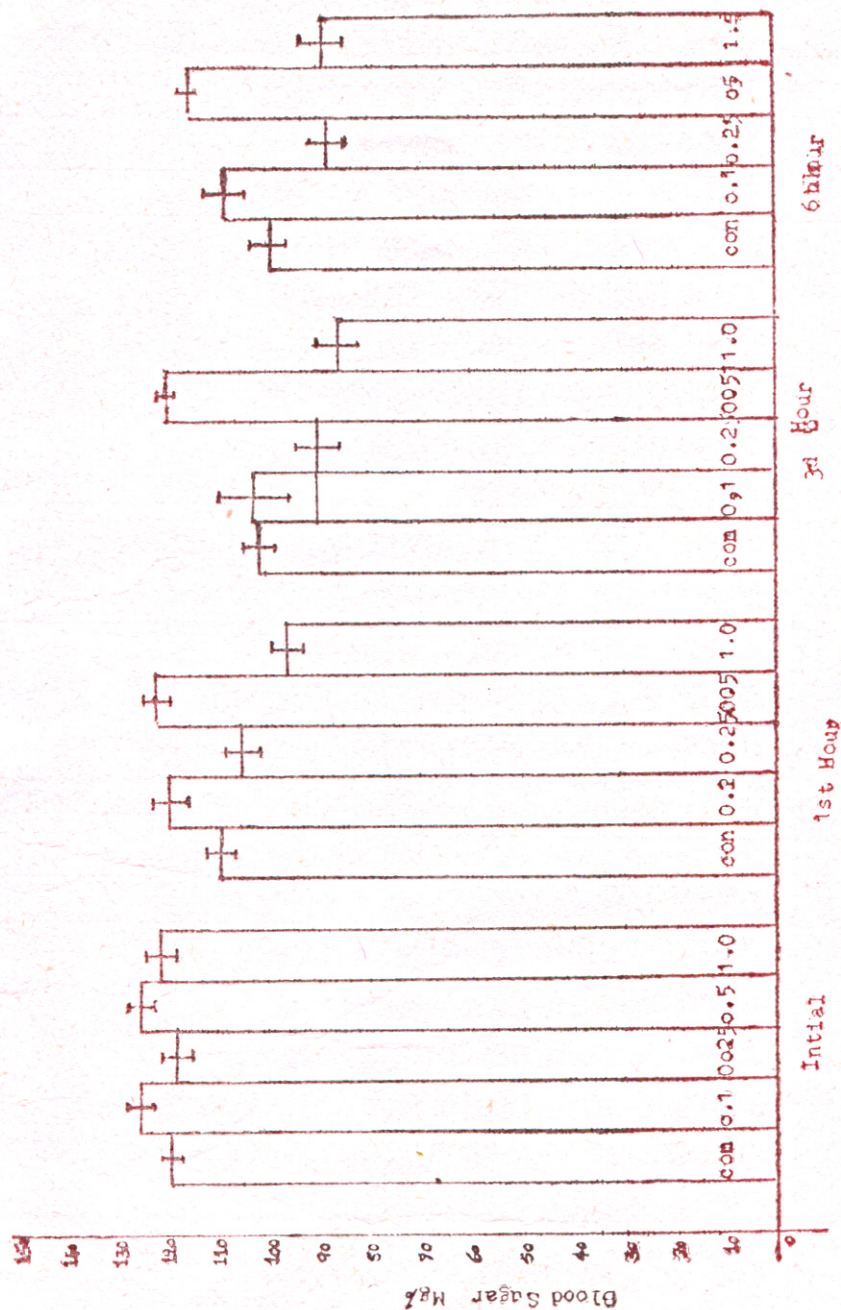
Prophylactic Study

20 albino rats were taken, grouped and kept in two (10+10) cages. The treated group was given the test drug in the dose of 0.5 gm/kg body weight (b. i. d.), for 3 days. The control group was given only gum-acacia solution. After 3 days diabetes was induced with alloxan after keeping the animals in 18 hrs. fast.

Blood sugar was estimated before and after 24 and 48 hours of alloxan administration. The results are shown in Table 2; fig. 2.

Fig:2 Prophylactic effect of Swarna Vanga
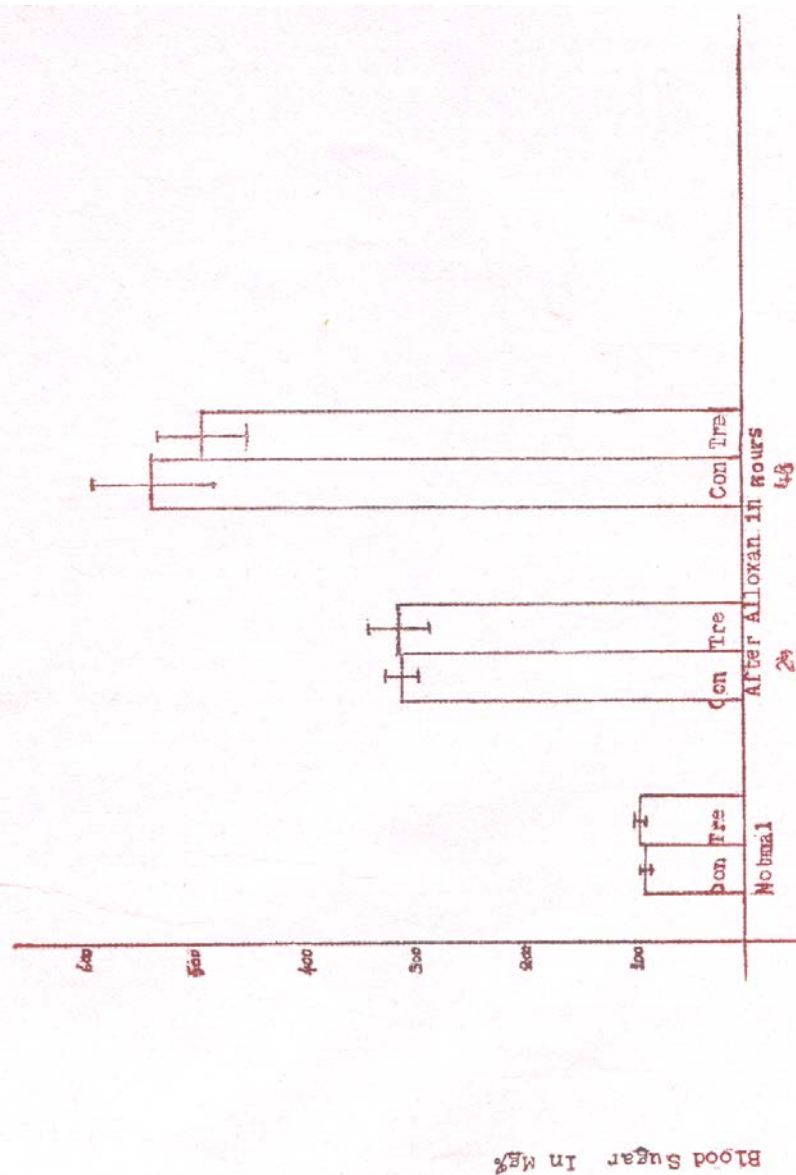
Hyperglycaemic [Anti-Diabetic – Experiment

20 albino rats were kept under fast for 18 hours. The alloxan diabetes was induced in

usual manner. The blood sugar was estimated and the animals having blood sugar was estimated and the animals having blood sugar more than 200 mg% were taken

for the study, and the rest were discarded. They were divided into control (7). and

treated groups (7). The treated group was given the test drug in 0.5 gm/kg body weight does b.i.d. for 15days and control group only gum-acasia solution.

The blood was collected before and after the 2nd, 4th, 8th and 16th day.

The results are shown in table 3; fig. 3.

Fig:3   Hypoglycaemic effect of Swarna Vanga on Alloxan induced hyperglycaemia.
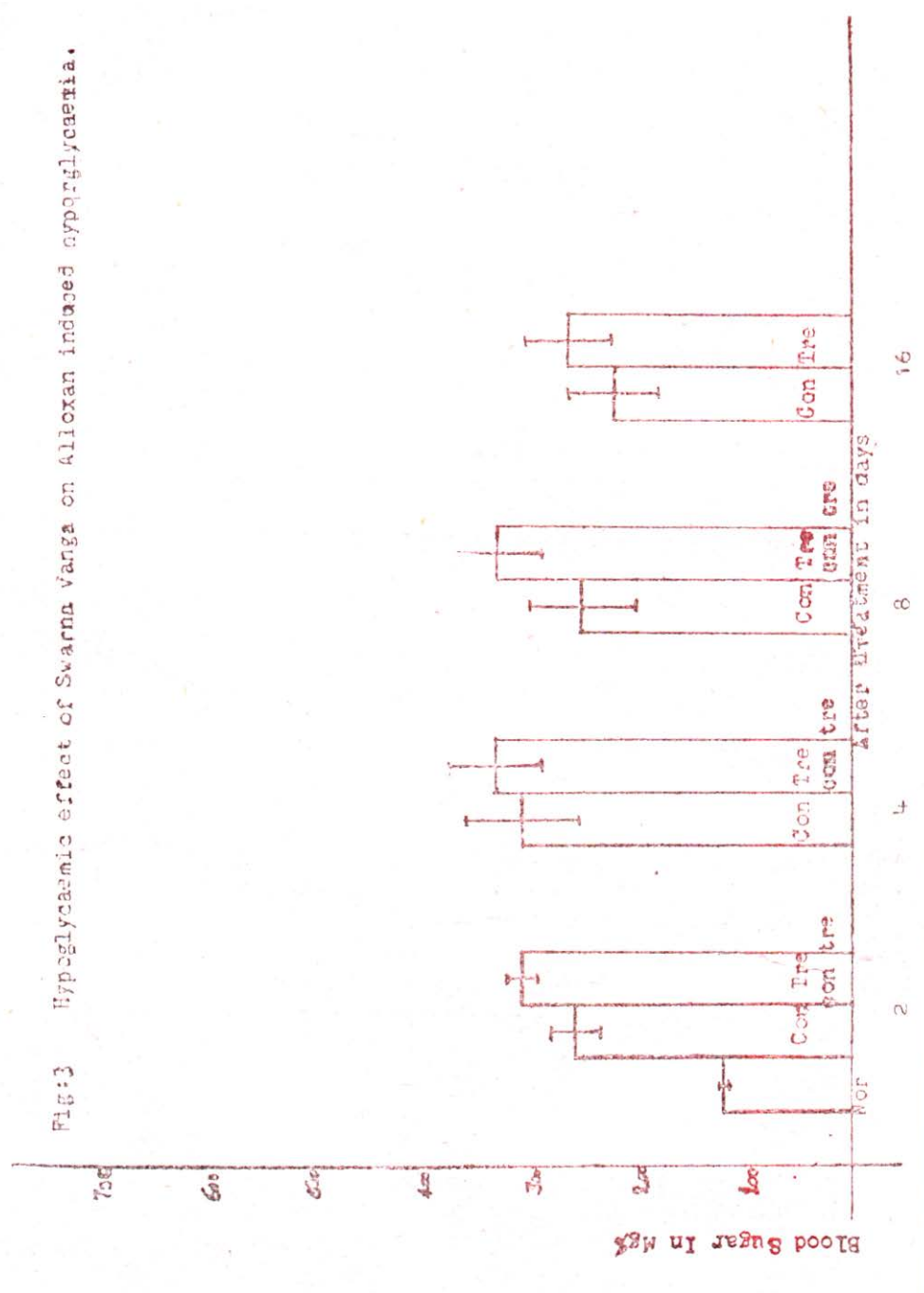
Observation & Results

1) The rats which received the alloxan had passed pinkish coloured urine a few minutes after alloxan administration.

2) Later all the rats started passing large volumes.

3) Most of the animals have been emaciated.

4) In Antidiabetic experiment. Three rats did not become diabetic and 3 animals have died after developing convulsions.

5) The water consumption was also found increased by two times to the normal.

TABLE-I
NORMOGLYCAEMIC

The Effect of Swarna-Vanga on blood sugar levels of normal albino rats. Data represent mean ± S. E. blood sugar levels (Mg%) befoe) & after (1. 3, & 6) the drug and mean% fall (-) or rise (±) 1, 3 & 6 in blood sugar < levels in self conrol observations in cross over design P indicates Paired "t" value and "t" indicates studens 't' test.

Group	Dose in gm/kg.	No. of animals	Mean ± SE, Blood Sugar levels (Mg%)				Mean ± SE. fall (-) or rise (+) in Blood Sugar after (in hours)		
			O	1st	3rd	6th	1st	3rd	6th
Control	Gum-acacia suspension	39	119.03±1.59	109.39±2.61	100.32±2.85	99.97±3.24	3.78* 7.79 ±2.06	6.39** 15.48 ±2.42	6.15*** 15.87 ±2.58
Treated	0.1	10	125.01 ±2.72	118.2±3.81	102.6± 6.61	108.9±4.06	4.02±3.06 t.1.02N S	18.36±4.31 0.58N S	13.82±2.67 0.47N S
	0.25	10	118.00 ±3.13	105.7±3.45	90.9±3.59	88.3±3.65	4.16** 10.11±2.43 0.73NS 1.69NS	9.21*** 22.93±2.49 2.15<0.05 2.79NS	10.14*** 25.05±2.47 2.57<0.02 3.50*
	0.5	10	125.5±2.73	121.5±2.09	119.3±1.44	115.6±2.39	2.97±1.75 t. 1.78NS	4.69±1.68 3.66<0.001	7.67±2.19 2.42<0.02
	1.0	10	121.6 ±2.99	96.1 ±3.29	85.00 ±4.02	89.1 ±4.83	9.58*** 20.70 ±2.16 4.33<0.001	11.14*** 30.19 ±2.71 4.05<0.001	9.35*** 27.02 ±2.89 2.88<0.01

TABLE-II

Showing the Effect of Swarna-Vanga (0.5gm/kg body wt. oral) on blood sugar levels in albino rats when administered prior to and along with alloxan. Data represented mean blood sugar ± S.E. (Mg%). Number in parentheses indicate the number of observations.

Group	Normal	24 hours	48 hours	
Control	80.5±	309.2±	539.45±	
	2.25	15.51	56.49	
	(10)	(10)	(9)	
	A_1	A_2	A_3	
Treated	90.7±	312.9±	491.89±	
	4.14	25.89	41.47	
	(10)	(10)	(9)	
	B_1	B_2	B_3	
	$A_1: A_2$	14.59<0.001	$B_1: B_2$ 8.48<0.001	$A_1 : B1$ 2.17 < 0.05
	$A_1: A_3$	8.12<0.001	$B_1: B_3$ 9.63<0.001	$A_2 : B2$ 0.12 N.S.
				$A_3 : B3$ 0.68 N.S.

TABLE-III

The effect of Swarna Vanga (0.5 gm/kg body wt. oral) on the blood sugar levels of alloxan induced hyperglycaemic albino rats. Data represent blood sugar mean ± S. E. (Mg%) Values. Number in parenthesis indicate the number of observations.

Group	Normal	After alloxan in days			
		2	4	8	16
Control	121.1±	259.14±	308.29±	252.00±	220.29±
	2.01	22.06	49.76	49.73	39.37
	(20)	(7)	(7)	(7)	(7)
	A_0	A_2	A_4	A_8	A_{16}
Treated	3	311.5±	333.67±	323.20±	266.40±
		12.85	44.35	43.08	41.21
		(7)	(7)	(6)	(6)
		B_2	B_4	B_8	B_{16}

$A_0:A_2$ 6.23 < 0.001	$A_0:B_2$ 14.68 <0.001	$A_2:B_2$ 2.05 N.S.
$A_2:A_4$ 0.90 N.S.	$B_2:B_4$ 0.48 N.S.	$A_4:B_4$ 0.38 N.S.
$A_2:A_8$ 0.13 N.S.	$B_2:B_8$ 0.26 N.S.	$A_8:B_8$ 1.09 N.S.
$A_2:A_{16}$ 1.16 N.S.	$B_2: B_{16}$ 1.05 N.S.	$A_{16}:B_{16}$ 0.81 N.S.

DISCUSSION

As per literature swarna vanga has been claimed to possess pramehaghna effect. Madhumeha is one of the subtypes of prameha, and so a systametic study has been carried out to verify this claim, on normoglycaemic , alloxan induced hyperglycaemic rats and also to assess its prophylactic effect.

The experiment on normoglycaemic rats showed that swarna vanga in 1 gm/kg dose produced a significant fall in blood sugar reading at 1st 3rd and 0.25 gm kg dose, the fall was obvious only in 3rd hour reading and in still lower doses the hypoglycaemia produced was not much significant statistically. This indicates that the drug is more effective in higher doses on normoglycaemic rats than lower doses.

1nprophylactic study though the drug has not prevented the hyperglycaemic condition completely, however, the results indicate that the increase in blood sugar level in treated group after 48 hour is less pronounced than controls, though statistically it is not found significant.

1n alloxan induced hyperglycaemia though the fall is statistically not significant but on comparison we can find a noticeable fall in treated group than the control.

By seeing the results of normoglycacaemic, prophylactic and antidiabetic experimens we can say that the drug has some role to play in lowering the blood sugar level. It may be of mild nature

CONCLUSION

It has shown significant hypoglycaemic effect in normoglycaemic rats, though in prophylactic and in alloxan induced diabetic rats the effect is not found statistically significant.

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