

AN EXPERIMENTAL STUDY ON MAKARADHWAJA

**PRADEEP KUMAR PRAJAPATI, DAMODAR JOSHI AND
GOVIND PRASAD DUBE**

Department of Rasashastra and Basic Principles Institute of Medical Sciences, Banaras
Hindu University, Varanasi- 221 005.

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ABSTRACT: *The authors report in this article an evaluation of the Rasayana effect of makradhwaja through biochemical parameters like – S.G.O.T., S.G.P.T and Blood urea along with E.C.G.*

INTRODUCTION

In the field of Ayurveda, there is a vast range of rasayana Preparations amongst them Makaradhwaja is a well known rasayana remedy which is a mercurial preparation and commonly used by physicians to maintain the health of a healthy person protecting him from various diseases and to cure various acute or chronic ailments, makaradhwaja is generally used with panaswasa (betal leaf juice), Ardakaswarasa (Zinger juice), madhu (Honey) or with other suitable anupanas (Adjuvants)¹ through oral route for therapeutic purposes.

The metals and minerals are in use since dates back to vedic period though their pharmaceutical and therapeutic development took place during medieval period. Makaradhwaja contains heavy metals like Mercury, Iron, Manganese, cobalt, Nickel and chromium where mercury and sulphur are its major constituents and remaining others are in traces analysed chemically as well as spectroscopically².

The review of Rasa shastra literature reveals that impure mercury if used internally may likely produce many complications (unwanted effects) in the body viz. Aruchi (nausea), vidaha (Burning

sensation), Kushtha (Skin diseases) and even death also³. So there are strict directions for samanya (general) and vishesa (specific) shodhana⁴ (Purification) of parade (Mercury). Probably the ancient scholars were not quite satisfied with only shodhana process of parada regarding its therapeutic use so they adopted one more step forward in the form of Murchhana or Gandhaka Jarana⁵. Gandhaka Jarana is a process in which the Parada is triturated with gandhaka (Sulphur) and subjected to heat to allow burning of extra sulphur so that a suitable compound of the drug is obtained, which can be administered internally without any fear of side/toxic effects, hence murchhana is such an important process without which mercury may not become suitable for therapeutic use. Due to this reason there is no single ayurvedic physician who has any hesitation in prescribing mercurial drugs. After its use no toxic effect has been noticed till date while modern scientists very much hesitate to recommend it for internal use considering it highly toxic agent.

Hence due to its high importance in therapeutics and to discard the objections of modern scientists regarding its internal use, an attempt has been made to establish the

effect of drug on experimental animals (Rabbits).

Material and Method

Experimental animals

Drug – Makaradhwaja

Suspension media- gum Acacia powder

Mortar and pestle – 200 ml capacity

Syringe of 10 ml

Rubber tube for feeding.

All the animals kept in laboratory for acclimatization for 7 days, these were weighed approx 1.5 kg to 2 kg each they were divided into two groups and kept in separate cages. The drug was administered in dose of 3 gm/100gm of body weight for a period of 6 weeks. Blood samples were collected after two weeks interval along with E.C.G report.

Preparation of Dosage form

The drug (Makaradhwaja) is not soluble in water therefore a suspension of gum acacia is made for oral administration.

The 10 gm. of gum acacia dissolved in 100 ml of distilled water by gradual trituration in a mortar. Then well prepared solution was taken according to the body weight of animal and added makaradhwaja at the dose of 3 mg/ml/100 gm. of body weight for the preparation of the suspension.

Procedure

After acclimatization period of 7 days the drug was administered by rubber tube according to the body weight for the period of two weeks. On 15th day E.C.G recording was done and on the 16th day the blood samples were collected from the marginal artery of ear by a small cut. These samples were analysed for estimation of S.G.O.T., S.G.P.T and blood urea for evaluation of any toxicity.

Table No.1: Effect of Makaradhwaja on circulating Blood Urea.

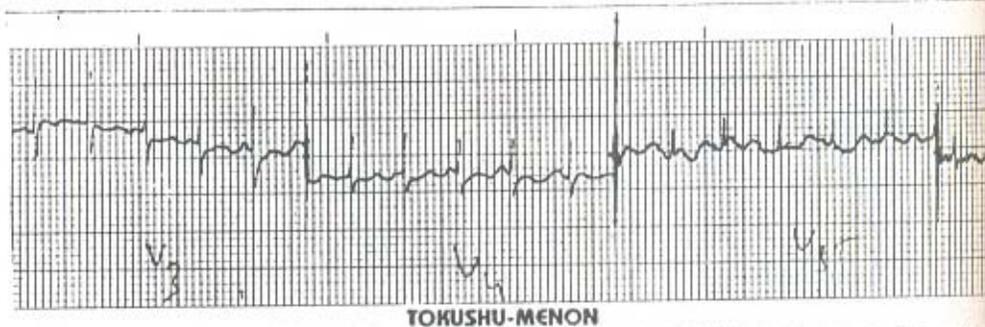
S. No	Initial (Normal)	After two weeks treatment	After four weeks treatment	After six weeks treatment
1.	75.0	77.5	60.0	45.0
2.	70.0	72.5	57.5	40.6
3.	62.0	71.0	70.0	55.0
4.	47.5	81.0	28.0	30.0
5.	50.0	70.0	30.5	-
6.	33.5	80.0	36.0	32.5
Mean	56.33	75.33	47.08	40.62
±S.E	6.34	1.95	7.25	4.49
No.	(6)	(6)	(6)	(5)

Table No.2: Effect of Makaradhwaja on circulating S.G.O.T.

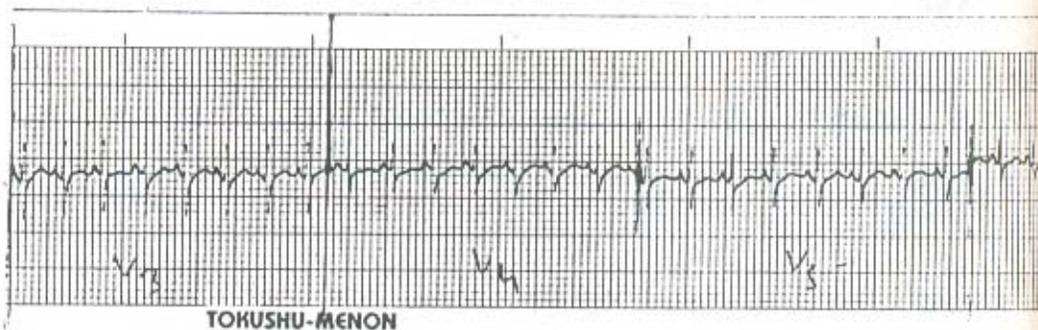
S. No	Initial (Normal)	After two weeks treatment	After four weeks treatment	After six weeks treatment
1.	24.0	40.0	62.0	72.0
2.	24.0	40.0	46.0	50.0
3.	76.0	28.0	41.0	72.0
4.	38.0	34.0	30.0	21.0
5.	30.0	34.0	30.0	-
6.	30.0	38.0	12.0	20.0
Mean	37.00	35.67	36.83	49.17
±S.E	8.08	1.89	6.94	9.67
No.	(6)	(6)	(6)	(5)

Table No.3: Effect of Makaradhwaja on circulating S.G.P.T.

S. No	Initial (Normal)	After two weeks treatment	After four weeks treatment	After six weeks treatment
1.	36.0	22.0	10.0	58.0
2.	32.0	28.0	24.0	47.0
3.	50.0	24.0	24.0	80.0
4.	28.0	37.0	35.0	24.7
5.	20.0	37.0	40.0	-
6.	28.0	35.0	32.0	25.3
Mean	32.33	30.17	27.50	47.00
±S.E	4.14	2.79	4.34	10.43
No.	(6)	(6)	(6)	(5)



Initial Electro Cardiogram before administration of Makaradhwaja



Electrocardiogram after six (6) weeks treatment of Makaradhwaja

Discussion

Observations of the experiment shows that after two weeks of treatment, there is initial increase in circulating blood Urea. It may possibly due to general vasodilatation action of the drug which reduces glomerular filtration by lowering blood pressure in

glomeruli, It may not be taken as toxic effect of the drug as there is no significant increase is noticed in the level of S.G.O.T and S.G.P.T.

It is important to note that the readings of blood Urea levels after four weeks and after six weeks showed significant fall in blood urea levels which may be taken as the positive sign and may be explained as that after some time. There is a better clearance of drug due to compensatory mechanism adopted by the various living cells of kidney and against the unfavourable condition in initial stages. The gradual decrease in blood urea level after two weeks suggest the increase in renal blood flow along with increased catecholamine like substances which may help in maintaining the glomerular filtration rate. It also suggest the improved kidney function instead of probable damage, it was also deserved that there is simultaneous increase in S.G.P.T and S.G.O.T levels after four weeks and six

weeks treatment but this increase is not beyond the normal levels and thus may not be taken as the toxic effects of the drug and there are suggestive of increase cellular activity with better clearance of waste product by the kidney is indicative of desired rasayana effect of makaradhwaja due to increase metabolic activity and suggesting improvement in the function of body organs and healthy state of life in the experimental animals.

The E.C.G taken after six weeks treatment shows a well defined Q.R.S complex specially in chest lead (V6) as compared to initial electro cardiogram as shown in figure. It is indicative to increase in force of contraction of ventricles and may be taken as positive for makaradhwaja effect on heart.

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