Ancient Science of Life Vol. No 17(4) April 1998 pages 305 - 312

ANTI – INFLAMMATORY POTENTIAL OF BALARISHTAAND DHANVANTARA GUTIKA IN ALBINO RATS

MUZAFFER ALAM, K.K SHANMUGA DASAN, SUSAN THOMAS and JOY SUGANTHAN
Captain Srinivasa Muri Drug Research Institute for Ayurveda, Madras – 600 106

Received: 9 February, 1996 **Accepted: 7 December, 1996**

ABSTRACT: *Balarishta and Dhanvantara gutika are ayurvedic medicines prescribed in different diseases including rheumatism. These medicines were screened for anti-inflammatory activity against cotton pellet induced granuloma in albino rats. There was significant reduction in cotton pellet weight by both the tested drugs. Dhanvantara gutika significantly reduced the ascorbic acid in adrenal. Acid phosphatase, GPT and GOT activities were significantly reduced by Balarishta, Dhanvantara gutika and phenyl butazone in liver. In the serum acid phosphatase activity was significantly reduced by both the tested drugs and phenul butazone while GPT activity was lowered by Balarishta alone and GOT activity was reduced by Balarishta and Dhanvantara gutika. Phenyl butazgone reduced the activity of GPT.*

INTRODUCTION

Balarishta and *Dhanvantara gutika* are two Ayurvedic medicines which are prescribed in the treatment of rheumatism. *Balarishta* is a drug of asavas and arishtas group while *Dhanvantara gutika* is a medicine of gutika/vati group. *Balarishta* is indicated in *Agnimandya, daurbalya* and *vataja roga* (1). *Dhanvantara gutika* is used in cases of *kasa, swasa, hydroga, vata* and *kapha* diseases (1).

Experiments were carried out to screen *balarishta* and *Dhanvantara* gutika for their anti-inflammatory activity against cotton pellet induced granuloma in albino rats.

MATERIALS AND METHODS

The raw drugs were purchased from the local drug traders, identified and used for preparing *Balarishta* and *Dhanvantara gutika* (Tables 1 & 2) as per the procedures detailed in the Ayurvedic Formulary, Part I (1). Phenylbutazone was bought from the local medical shop and was used as reference drug.

Antiinflammatory effect

Albino rats of Wistar strain of either sex weighing 100-150g from the Institutes animal colon were used for the study (2). There were 5groups of 8 animals each. Pellets of surgical cotton weighing 10 ± 1 mg were sterilized in hot air oven at 120^{o}C for 3 hours and implanted subcutaneously each in both the axaillae and grains of the animals under light anaesthesia. The first group served as normal control and second group as inflammatory control. The third, fourth and fifty groups were administered phenylbutazone, *Balarishta* and *Dhanvantara gutika* respectively for seven days. *Dhanvantara gutika* and phenylbutazone were suspended in 0.5% carboxy methyl cellulose (CMC) and administered orally at 100mg/kg body weight. Balarishta was administered orally at a dose of 0.5ml/rat/day. The rats were

maintained on Hindustan Lever rat feed, Bengal gram and cabbage. Water was allowed ad *libitum*.

On the 8^{th} day all the animals were sacrificed and the pellets were dissected out, cleaned from extraneous tissues and dried overnight at $70^{o}C$. The weight of each pellet was recorded. Thymus, spleen and adrenals were dissected out, blotted between folds of filter paper and weighed Blood was drawn through a glass syringe by puncturing the heart.

Biochemical parameters

Serum was separated from the blood and 1% liver homogenate was prepared in cold double distilled water. The serum and liver homogenate were used to assay the activity of acid phosphatase (3) glutamate pyruvate transminase (GPT) (4) and glutamate oxaloacetate tranasaminase (GOT) (4). Adrenal ascorbic acid (5), serum and liver protein (6) were also determined. Te results were analsed using Student's "t" test.

RESULTS

There was a significant increase in the weight of thymus in the groups treated with *Balarishta, Dhanvantara gutika* and phenylbutazone increased the weight of spleen significantly (Table 3). There was no effect on the weight of adrenals but ascorbic acid content was significantly reduced by *Dhanvantara gutika* (Table 3). Both the drug tested groups and phenylbutazone group showed significant reduction in the weight of cotton pellets (Table 3).

In the liver Acid phosphatase, GPT and GOT activities were significantly reduced b Balarishta, *Dhanvantara gutika* and phenylbutazone without any effect on the protein content (Table 4).

Acid phosphatase activity was significantly reduced in serum by the tested drugs and phenylbutazone. GPT activity was lowered by *Balarishta* and phenylbutazone while GOT activity was reduced by *Balarishta* and *Dhanvantara gutika* (Table 5). Serum protein was significantly lowered b *Balarishta* alone (Table 5).

DISCUSSION

Dhanvantara gutika significantly reduced the level of adrenal ascorbic acid which is indicative of enzyme like Got and GPT could influence the continuous formation of bradykinin like polypeptides during inflammatory process (7). Phenylbutazone, the reference drug did not affect the liver GOT and GPT in normal animals but significantly reduced the activity in inflammatory conditions. Acid phosphatase was inhibited by all the three drugs indicating the stabilization of lysosomal membrane (8, 9). Acid phosphatase is frequently employed as a marker enzyme to assess the lysosomal change both in vivo and in vitro because it is localized exclusively in the particles and its release parallels that of lysosomal hydrolases (10).

The study reveals that *Balarishta* and *Dhanvantara gutika* possess anti-inflammatory activity thereby proving the claim made in the ayurvedic text 5.

Table No.1
Raw drugs involved in preparation of *Balarishta*

Sl.No	Raw Drug	Botanical name	Anatomical part used	Quantity (g)
1	Bala	Sida cordifolia Linn	Root	4800
2	Asvagandha	Withania somnifera Dunal	Root	4800
3	Water for decoction Reduced to			49.152 L 12.288 L
4	Guda	Saccharum officinarum Lin		14000
5	Dhataki	Woodfordia fruticosa Kurz	Flower	768
6	Payasa	Fritillaria voylei H.OK	Root	96
7	Pancangula	Ricinus communis Linn.	Root	96
8	Rasna	Pluchea lanceolata Oliver-Hiern	Root	48
9	Ela	Elettaria cardamom Maton	Seed	48
10	Prasarani	Paederia foetida Linn	Leaf	48
11	Devapuspa	Syzgium aromaticm Merr & L.M. Perry.	Flower bud	48
12	Usira	Vetiveria zizaniodes Linn	Root	48
13	Svadamstra	Tribulus terrestris Linn	Fruit	48

Table No.2
Raw drugs involved in preparation of *Dhanvantara gutika*

Sl.No	Raw Drug	Botanical name	Anatomical part used	Quantity (part)
1	Ela	Elettaria cardamom Maton	Seed	1
2	Visva	Zingibar officinale Rosc	Rhizome	1
3	Abhaya	Terminalia chebula Retz.	Fruit	1
4	Jati	Jasminum officinale Linn. Var. gradiflorum Bailay	Seed	1

5	Brhati	Solanum indicum Linn	Root	1
6	Arya	Swertia chirata Buch Ham	Plant	1
7	Jiraka	Cuminum cyminum Linn	Fruit	1
8	Cinsona	Piper cubeba Linn.f.	Seed	1
9	Bhunimba	Swertia chirata Buch. Ham.	Plant	1
10	Rudraksa	Elaecarpus ganitrus Roxb.	Seed	1
11	Suradaru	Cedrus deodara Roxb.	Heart Wood	1
12	Karpura	Cinnamomum camphora Linn		1
13	Karigutha	Excreta of new-born elephant	--	1
14	Mrgaretasa	Civent	--	1
15	Jiraka Kvatha	Cuminum cyminum Linn	Fruit	Q.S for bhavana
16	Himambasa	Rosa centifolia Linn.	Rose Water	Q.S for bhavana

Table No. 3
Effect of *Balarishta, Dhanvantara gutika* and phenylbutasone on organ weights, pellet weight and abrenal Ascorbic acid (Values are mean ± SD)

Status	Organ weights (g/100g body weight			Pellet weight (mg)	% reduction in pellet weight	Adrenal ascorbic acid (mg/g)
	Spleen	Thymus	Adrenals			
Normal control	0.166 ± 0.0076	0.0110 ± 0.0026	0.0090 ± 0.00097		--	1.267 ± 0.134
Inflammatory control	0.169 ± 0.016	0.0138 ± 0.0023	0.0102 ± 0.00150	44.50 ± 9.30	--	1.945 ± 0.220
Phenylbutazone	0.229 ± 0.027	0.0206[b] ± 0.0040	0.0101 ± 0.00093	28.48[a] ± 3.30	36	1.935 ± 0.332
Balarishta	0.193 ± 0.026	0.0206[b] ± 0.0030	0.0102 ± 0.00160	31.26[a] ± 3.57	29.75	2.365 ± 0.389
Dhanvantara gutika	0.0240 ± 0.036	0.015b ± 0.0036	0.0113 ± 0.00090	36.23[a] ± 5 .20	18.4	0.928 ± 0.174[a]

Values are significant when p<0.05 P values a P<0.001, p<0.01

Table No. 4
Effect of *Balarishta, Dhanvantara gutika* and phenylbutazone on Liver Biochemical parameters (Values are mean ± SD)

Status	Protein mg/g	Acid phosphatase mg phenol liberated /mg protein in 60 min at 37°C	GPT Mg pyruvate liberated/mg protein in 30 min at 37°C	GOT mg pyruvate liberated/mg protein in 60 min at 37°C
Normal control	106.6 ± 7.33	0.0562 ± 0.0138	0.6131 ± 0.0674	0.2495 ± 0.0259
Inflammatory control	92.5 ± 6.39	0.1106 ± 0.016	0.7723 ± 0.0688	0.6795 ± 0.0678
Phenylbutazone	115.6 ± 3.57	00542 ± 0.0062[a]	0.5360 ± 0.0318[a]	0.3016 ± 0.0529[a]
Balarishta	123.6 ± 3.57	0.0575 ± 0.0090[a]	0.4288 ± 0.0488[a]	0.2807 ± 0.0311[a]
Dhanvantara gutika	131.7 ± 6.87	0.0508 ± 0.0103[a]	0.4365 ± 0.0496[a]	0.1848 ± 0.0260[a]

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