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Nephroprotective effect of Brahmi Ghrita

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Abstract

Brahmi Ghrita is an important formulation used in treatment of learning and memory disorders. It contains *Brahmi (Bacopa monneri)*, *Vacha (Acorus calamus)*, *Kushtha (Saussurea lappa)*, *Shankhapushpi (Convolvulus pluricaulis)* and old clarified butter (*Puran Ghrita*). Here an attempt was done to assess the effect of *Brahmi Ghrita* on Serum creatine and Serum Urea in experimental animals. For this purpose, *Brahmi Ghrita* was prepared as per standard *Sneha paka* process mentioned in our classics. For experimental study one of those animals were selected which have high Serum creatine and Serum Urea level. These animals were divided in three groups, among them one was an experimental control group and animals of the other two groups were treated with *Brahmi Ghrita* in a dose of 400 and 800 mg/kg body weight of rats. After period of one month haematological parameters, Serum creatine and Serum Urea was examined. It was observed that *Brahmi Ghrita* significantly decreases Serum creatine in dose dependent manner and have no adverse effect was observed on haematological parameters.

Keywords: *Brahmi Ghrita*, Serum creatinine Serum Urea

1. Introduction

Brahmi Ghrita (BG) is an important formulation mentioned for the treatment of *Unmad*, *Apasmar* and *Graha* disorders. It contains *Bacopa monneri*, *Acorus calamus*, *Saussurea lappa*, *Convolvulus pluricaulis* and old clarified butter (*Puran Ghrita*). Among them *Bacopa monneri* was used as a brain tonic to enhance memory, learning, concentration^[1] and to provide relief to patients with anxiety or epileptic disorders.^[2] The rhizome extract of *Acorus* have been reported for analgesic^[3], cardiovascular^[4], anti inflammatory^[5], anti bacterial^[6], anti ulcer, cytoprotective, anti convulsant^[7], hypolipidemic, antispasmodic.^[8] *Saussurea lappa* roots have been widely recommended in inflammation-related diseases characterized by rheumatoid arthritis, chronic gastritis, asthma and bronchitis in traditional medicine^[9]. *Convolvulus pluricaulis* is reported for brain tonic and laxative.^[10] *Ghrita* carries the therapeutic properties of herbs to all the body tissue. The lipophilic action of *ghee* facilitates transportation to target organ and final delivery inside the cell since cell membrane also contained lipid.^[11] Ingredients of *Brahmi Ghrita* are used separately in the treatment of various disorders. As a whole *Brahmi Ghrita* has Nootropic activity, Hepatoprotective activity. It is necessary to evaluate the combine effect of all ingredients on kidney. In present study we scientifically evaluate the combine effect of all ingredients of *Brahmi Ghrita* on serum urea and serum creatinine.

2. Material and methods

2.1 Pharmaceutical study

BG was prepared as described in one of our earlier studies.^[12] Briefly, it was prepared by adding paste of *B. monneri* (40% w/w), *A. calamus* (20% w/w), *C. pluricaulis* (20% w/w) and *S. lappa* (20% w/w) in freshly prepared 3 liter juice of *B. monneri* in stainless steel vessel having 750 ml clarified butter. Above mixture was heated for 9 h and filtered after acquiring completion test. In this way, BG was prepared.

2.2 Animals

Charles Foster rats of either sex weighing between 160 g and 180 g were used for experimental study. The animals were obtained from the Central Animal House, Institute of Medical Sciences, Banaras Hindu University, Varanasi. The animals were housed in polypropylene cages at an ambient temperature of 25 °C ± 1 °C and 45-55% relative humidity, with a 12:12 h light/dark cycle. Animals were provided with commercial food pellets and water *ad libitum*

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unless stated otherwise. They were acclimatized to laboratory conditions for at least 1 week before using them for the experiments. Principles of laboratory animal care (National Institute of Health publication number #85-23, revised in 1985) guidelines were always followed.

2.3 Experimental study

Only those animals were selected for the study which has high serum creatinine and serum urea, in this way total eighteen animals were taken. These animals were divided in to three groups namely A, B and C, having six animals in each group. Group A was control group, only food and water was given to these animals. Group B and C was Brahmi Ghrita treated group with the dose of 400 & 800 mg/kg body weight of animals for thirty days. After thirty days blood of animals were collected and analysis was done for serum creatinine and serum urea.

Table 1: Showing effect of *Brahmi Ghrita* on haematological parameters

Group	Dose (mg/kg)	Haemoglobin mg/dl	TLC (X 10 ³ /μl)	Neutrophil	Lymphocyte	Eosinophil	Monocyte	Basophil
Control		15.23±0.94	7.02±0.61	34.83±4.31	61.5±5.24	1.5±0.55	1±0.00	0.33±0.52
BG	400	13.95±1.13	7.12±0.52	31.83±6.21	65.67±6.47	0.83±0.41	1±0.00	0.00±0.00
BG	800	14.02±1.47	7.07±0.55	30.17±4.26	68.50±4.04	1.33±0.52	1.17±0.41	.00±0.00

BG: *Brahmi Ghrita*, n: six animals in each group, Values are Mean ±SD, TLC: Total leukocyte count

Table 2: Showing effect of *Brahmi Ghrita* on Serum creatine, Serum Urea, Globulin and albumin

Group	Dose	S. Creatinine	S.Urea	Globu.	Albu.
Control	-	2.15±0.19	73.25±5.34	4.98±0.51	9.02±1.55
BG	400	1.7±0.40*	71.08±5.29	5.08±0.67	8.98±1.21
BG	800	1.62±0.19*	65.82±4.66	4.88±0.47	8.67±0.97

BG: *Brahmi Ghrita*, n: six animals in each group, Values are Mean ±SD, S. Creatinine: Serum Creatinine, S.Urea: Serum Urea, Globu: Globulin, Albu: Albumin, *p<0.05 compare to control group

4. Discussion

Kidney function is assessed in clinical practice to screen for kidney disease, to adapt dosage of medications for renal clearance, and to follow the evolution of known kidney dysfunction. Glomerular filtration rate (GFR) is a useful index to assess the kidney function. [13] GFR can be measured directly by clearance studies of exogenous markers, such as iothalamate. However, these procedures are costly, time consuming and are not suited to the routine detection of kidney disease. Even to measure the clearance of endogenous substances, such as urea and creatinine (SCr), requires both serum and an accurately timed urine collection for determination of GFR. Currently, SCr is the most widely used method of assessing renal function in clinical practice; however, SCr levels remain within the normal range even when renal function is significantly impaired. [14] Plasma concentration of urea is still used for usual screening renal test. Renal dysfunction diminishes the ability to filter creatinine and therefore serum creatinine rises. This is important pathological condition that causes a significant increase in the serum creatinine level due to damage of a large number of nephrons. Unlike the BUN, the serum creatinine level is not affected by hepatic protein metabolism. Creatinine levels are often preferred to monitor renal function on a long-term basis. [15]

In present study it was observed that *Brahmi Ghrita* significantly decreases Serum creatinine. *Bacopa monnieri* have significant protective effect against morphine induced in term of Serum urea and serum creatinine. [16] It is reported that *Bacopa monnieri* mediate their protection via antioxidant or free radical scavenging activities due to the high concentration of flavonoids and alkaloids in its extract. [17] A protective effect for *Bacopa* on the hepatic or renal antioxidant status in

2.4 Statistical Analysis

The data, expressed as Mean ± SD, were subjected to Kruskal-Wallis one way analysis of variance (ANOVA). Inter group comparisons were made by Mann-Whitney-U-test (two tailed) for only those responses, which yielded significant treatment effects in the ANOVA test. $P < 0.05$ was considered statistically significant

3. Result

Serum Creatinine was significantly decreased in *Brahmi Ghrita* treated group when compared to control group. Serum Urea was also decreased in *Brahmi Ghrita* treated group. Haematological parameters were having slight variation among group but these changes were not significant.

morphine-treated rats was also reported. [18] *Shankhapushpi*, present in *Brahmi Ghrita* was reported to increase Serum creatinine and decreases Serum Urea. [19] *Vacha* is one of the ingredients of *Brahmi Ghrita* which was reported to decrease creatinine and increases urea. [20] Hematological parameters of *Brahmi Ghrita* treated rats showed absence of any significant increase or decrease of component when compared to control rats, such as low level of hemoglobin, abnormal count of total leucocytes and changed ratio of different constituents of leucocytes such as neutrophils, lymphocytes, eosinophils, monocytes and basophils shows possible hemopoietic toxicity. [21] But all the above mentioned hematological parameters were found normal and no significant changes were observed. Thus, *Brahmi Ghrita* seems to devoid of any adverse effect on hemopoietic system of rats.

5. Conclusion

Brahmi Ghrita decreased Serum Urea as well as Serum creatinine in dose dependent manner but did not show adverse effect on Haematological parameters.

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