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Research Article

Potent Hepatoprotective Phaltrikadi Kwath: A Clinical Study

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Abstract

Objective: The main object of present study is to clinically evaluate the efficacy of an Ayurvedic compound formulation Phalatrikadi Kvatha (PTK) on Hepatitis B patients.

Method: Total 59 Hepatitis B positive patients were selected from OPD and IPD of S.S. Hospital, Institute of Medical Sciences, B.H.U. PKT was given in a dose of 80 ml/day in two divided doses for 6 months and follow up was done on every third month. In each follow up Routine Hematological examinations- Hb%, TLC, DLC and ESR; Biochemical investigations- LFT, Serological test- HBsAg (for HBV) and HBV DNA and Radiological tests- USG whole abdomen were done.

Result: Result showed significant effect of Phalatrikadi Kvatha (PTK) on sign and symptoms of Hepatitis which was evidenced by laboratory investigations i.e. LFT ($p<0.05$), negative HBsAg in 8 patients and HBV DNA (Chi-square =45.9 and $P<0.01$).Thus present results showed efficacy of PKT on Hepatitis.

Conclusion: Present findings suggest that Phalatrikadi Kvatha (PTK) is an effective and beneficial formulation for management of Hepatitis B patients.

Introduction

Ayurvedic classics treasured a good number of single and compound formulations for management of various disorders. Among them Phaktrikadi kvatha (PTK) is a well known compound formulation mentioned in various Ayurvedic classics. It is a rational combination of Ayurvedic herbs beneficial for hepatic disorders. On comprehensive review it was found that there is variation in ingredients and indications of Phalatrikadi Kvatha (PTK). Two type of Phalatrikadi kvatha is mentioned in Ayurvedic compendia having different herbs. In Charaka Samhita and Bhaisajya-ratnavali (reputed Ayurvedic scriptures for treatment of ailments) it is prescribed for the management of Prameha ~Diabeties mellitus [1-2]. However, In Siddhasara Samhita PTK is first time enumerated as a remedy for liver disease, by the name of Phalatrika. In this context PTK contains 8 drugs namely- Amalaki (*Emblica officinalis* Gaertn.), Haritaki (*Terminalia chebula* Retz.), Bibhitaki (*Terminalia bellerica* Roxb.), Amrita (*Tinospora cordifolia* Miers.), Vasa (*Adhatoda vasica* Nees.), Katuki (*Picrorrhiza kurroa* Royale ex Benth.), Bhunimba (*Andrographis panniculata* Nees.) and Nimba (*Azadirachta indica* A. Juss.) [3]. The decoction of it has been prescribed to treat hepatic disorders especially Kamala (Hepatitis) [4-7]. The Sign and symptoms of Kamala are very similar to the Infectious hepatitis (especially Hepatitis B), which is an inflammatory liver disease caused by Hepetitis B Virus. The disease is epidemic in many parts of Asia and Africa and endemic in China. One third of the world population is seriously affected by Hepatitis B. It is estimated that 350 million individuals worldwide are infected with the virus, which causes 620,000 deaths worldwide each year [8].

Further, Phalatrikadi Kvatha (PTK) has been reported for the management of Kamala [4-7]. Therefore a clinical study has been conducted on the patients of Hepatitis B for its management by using PKT as a Trial drug. This study gave scientific justification for the use of PKT as hepato-protecter for Hepatitis B patients.

Materials and Method

Selection of patients

Total 59 patients of Hepatitis B attending OPD as well as IPD were selected for the present clinical study from S.S. Hospital, Institute of Medical Sciences, B.H.U., Varanasi.

Diagnostic criteria

The patients were diagnosed on the basis of : **1.** History **, 2.** Clinical signs and symptoms**, 3.** Hb%, TLC, ESR, 4. Liver function test**, 5.** USG Abdomen**, 6.** HBsAg**, 7.** HBV DNA.

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Table1: Ingredients, useful parts and ratio of drugs used for the preparation of Phaltrikadi Kvatha (PKT).

Ingredients	Part used	Botanical name	Family	Ratio
Amalaki	Fruit	Emblica officinalis Gaertn.	Euphorbiaceae	1 part
Bibhitaki	Fruit	Terminalia bellerica Roxb.	Combretaceae	1 part
Haritaki	Fruit	Terminalia chebula Retz.	Combretaceae	1 part
Guduci	Stem	Tinospora cordifolia Miers.	Menispermaceae	3 part
Vasa	Leaf	Adhatoda vasica Nees.	Acanthaceae	3 part
Kalmegha	Whole plant	Andrographis panniculata Nees.	Acanthaceae	3 part
Nimba	Bark	Azadirachta indica A. Juss.	Meliaceae	3 part
Kutaki	Root	Picrorrhiza kurroa Royale ex Benth.	Scrophulariaceae	3 part

Inclusion criteria

1. Age of patients was in between 15-70 yrs. **2.** History, clinical signs and symptoms suggestive of acute as well as chronic infective hepatitis was selected for the study.

Exclusion criteria

Patients who developed cirrhosis, malignancy, hepatic failure, hepatic encephalopathy and other complications, obstructive jaundice due to any cause. Other diseases which confuses in the interpretation of LFT. Patients suffering with other disease along with hepatitis like D.M. /T.B. etc.

Demographic profile

The following points were recorded– name, age, sex, religion, occupation, education, socio-economic status, habitat, dietary habit, addiction.

Clinical profile

The patients were selected on the basis of sign and symptoms of Kamala~Hepatitis mentioned in Ayurvedic classics and also in contemporary medicine i.e. Yellow discoloration of sclera, Yellow discoloration of skin, Yellow discoloration of Nails, Yellow discoloration of face, Burning sensation, Weakness, Decrease appetite, Reddish- yellow discoloration of Faeces, Reddish- yellow discoloration of urine, Toad like skin, Fatigue, Indigestion, Malaise and Weight loss [9,10].

Investigations

1. Routine Hematological examinations- Hb%, TLC, DLC and ESR. **2.** Biochemical investigations- LFT, **3.** Serological test- HBsAg (for HBV) and HBV DNA. **4.** Radiological tests- USG whole abdomen

Symptomatological Grading

Clinical assessment of symptoms and severity was done according to the grading of symptoms. The relative extant of all these criteria was recorded according to the rating scale in each patient at the initial stage i.e. before starting the treatment and subsequent follow up. Improvement of symptoms grading scale is supposed to be directly proportional to the improvement in the patient's conditions and his metabolic state. To assess the improvement clinical symptomatology was graded into five grades (0-4) on the basis of severity of duration. The change in the gradation of each symptom was assessed during every follow up to assess the effect of given treatment.

Drug and drug dosages- All crude drugs except *Picrorrhiza kurroa* Royale ex Benth. were collected from Rajiv Gandhi South Campus, Banaras Hindu University, Mirzapur and rhizomes of *Picrorrhiza kurroa* Royale ex Benth. were procured from crude drug market of Varanasi. All the drugs were identified with the help of standard sample preserved, in the department of Dravyaguna, Institute of Medical Sciences, Banaras Hindu University, Varanasi. Further sample of each drug was preserved in the museum of Dravyaguna for further reference (No. PKT. 1001-1008).

The drugs were shade dried and coarsely powdered. PKT was prepared by using classically mentioned amount of each drug [5]. 80-100 ml/twice daily decoction of PTK were given orally before meal with 2 spoons of honey for 6 month.

Follow up-At the interval of every 3 months assessment of drug action was done in each and every patient by the improvement of clinical signs and symptoms and through assay of biochemical parameters.

The study was conducted after approval of ethical committee of Institute of Medical Science BHU.

Analysis of data and use of statistical methods

Observations documented during the study were analyzed and finding was evaluated by using statistical method (Friedman's test, chi square test and paired t test) to establish the efficacy.

Observations and Results

The observation and results have been made in the present study on the demographic and constitutional profile of 59 patients of infective Hepatitis.

Cross table between Hepatomegaly before treatment and Follow-up 2 showed that before treatment 8.3% cases showed moderate (Grade 2), 33.3% cases mild (Grade 1) and 58.3% no Hepatomegaly.

Table 2: Hepatomegaly before treatment and Hepatomegaly follow-up 2 Cross tabulation.

			Hepatomegaly (FU-2)		Total
			0-absent	1-mild	
Hepatomegaly (BT)	0-absent	Count	28	0	28
		% of Total	58.30%	0.00%	58.30%
	1-mild	Count	16	0	16
		% of Total	33.30%	0.00%	33.30%
	2-moderate	Count	2	2	4
		% of Total	4.20%	4.20%	8.30%
	Total	Count	46	2	48
		% of Total	95.80%	4.20%	100.00%

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Table 3: Improvement in Routine blood tests in patients of Hepatitis.

	Investigations	Mean ± SD			Intra group comparison 'paired t test'
		BT	FU 1	FU 2	BT – FU 2
1	Haemoglobin %	12.41±2.07	12.35±2.07	12.52±1.77	0.029±1.11 t = 0.18 p>0.05 NS
2	TLC	9739.6±1749	9633.3±1308	9287.5±1644	617±218.5 t = 2.18 p>0.05 NS
3	ESR	12.17±7.3	11.74±4.4	11.11±2.4	1.51±6.345 t = 1.65 p>0.05 NS

BT= Before treatment, FU=Follow up

(Grade 0); after follow up-2, 95.8% patients were with no (Zero Grade) and 4.2% patients were with mild hepatomegaly (Grade 1) (Table 2).

The Intra group comparison 'paired t test' results for Hemoglobin % (t = 0.18 and p>0.05), total leucocytes count (TLC) (t = 2.18 and p>0.05) and, Erythrocytes sedimentation rate (ESR) (t = 1.65 and p>0.05) showed no significant change in routine blood test (Table 3).

Liver Function Test (LFT)

There is marked improvement in Liver function test which has been calculated by intra group comparison 'paired t test' which showed significant results for total bilirubin (t = 2.4 and p<0.05), Direct bilirubin (t = 2.4 and p<0.05), Indirect bilirubin (t = 2.07 and p<0.05) Total Protein (t = -2.20 and p<0.05), SGOT (t = 2.50 and p<0.05) SGPT (t = 2.40 and p<0.05 and Alk. PO_4 (t = 2.20 and p<0.05) (Table 4 and Graph 1).

Incidence of HBsAg at different follow up showed that after treatment in the 2nd follow up 8 patients became HBsAg negative while 40 patients were still HBsAg positive however 11 patients were withdrawn from the study (Table 5).

Quartile score for HBV DNA in patients of Hepatitis showed that 21 patients out of 59 had the 11.45 quartile score in the 25th quartile, 142 quartile score in the 50th quartile while 12100 quartile score in the 75th quartile. (**1.**) In the first follow up 7 patients out of 48 had the 1.40 quartile score in the 25th quartile, 21.40 quartile score in the 50th quartile while 110 quartile score in the 75th quartile. (**2.**) In the second follow up 6 patients out of 48 had the 1.08 quartile score in the 25th quartile, 9.90 quartile score in the 50th quartile while 43.95 quartile score in the 75th quartile (Table 6). Further intra group comparison Friedman's test for HBV DNA Before treatment and after treatment showed Chi-square =45.9 and P<0.001 which is highly significant.

Discussion

Ayurveda has very vividly description of Kamala roga, which is very much similar with sign and symptoms of Hepatitis, described in contemporary medicine. Hepatitis refers to the condition which affects the liver. The ingredients present in PKT are individually evaluated for their hepatoprotective function. Their capacity of hepato-cellular regeneration, Cholegogue and cholertic activity, Membrane stabilizing effect, Antiviral and antioxidant effect, Molecular nutrient effect, Enzyme and metabolic corrections Choleratic and cholegogue action helps in hepatoprotection and hepatocellular regenerastion [11]. Choleratic and cholegogue action of *Picrorhiza kurroa*, has been reported by fall in serum bilirubin due to clearance of bile passage, further anti-hepatitis B antigen activity

Table 4: Improvement in LFT in patients of Hepatitis.

	Investigations	Mean ± SD			Intra group comparison 'paired t test'
		BT	FU 1	FU 2	BT – FU 2
1	Bil. Total	1.28±1.4	1.12±1.3	1.094±1.02	0.27±0.775 t = 2.4 p<0.05 S
2	Bil. Direct	0.69±0.98	0.54±0.91	0.51±0.59	0.20±0.576 t = 2.4 p<0.05 S
3	Bil. Indirect	0.58±0.50	0.57±0.4	0.56±0.44	0.09±0.299 t = 2.07 p<0.05 S
4	Total Protein	7.29±1.34	7.34±1.3	7.6±1.2	-0.36±1.14 t = 2.208 p<0.05 S
5	SGOT	42.25±30.8	33.94±10.5	30.9±9.2	9.1±25.2 t = 2.5 p<0.05 S
6	SGPT	40.03±33.5	35.77±19.5	32.55±18.5	9.15±26.14 t = 2.40 p<0.05 S
7	Alk. PO_4	211.17±80.4	194.71±56.9	191.46±63.89	24.03±75.34 t = 2.20 p<0.05 S

BT= Before treatment, FU=Follow up

Table 5: Incidence of HBs Ag at different follow up.

HBsAg	No. of cases		Total
	Positive	Negative	
Before treatment	59	0	59
Follow up 1	46	2	48
Follow up 2	40	8	48

of *Picrorhiza kurroa* also helps in cure of Hepatitis patients. It is a well known fact that free radicals are collected in the extra-cellular fluid normally but in the diseased condition they are in excess and are not cleaned out by normal body physiology and start damaging the cell membrane. Anti-oxidants properties of most of the drugs in PKT formulation i.e Amalaki (*Emblica officinalis* Gaertn.), Haritaki (*Terminalia chebula* Retz.), Bibhitaki (*Terminalia bellerica* Roxb.), Amrita (*Tinospora cordifolia* Miers.), Vasa (*Adhatoda vasica* Nees.), Katuki(*Picrorrhiza kurroa* Royale ex Benth.), Bhunimba (*Andrographis panniculata* Nees.) and Nimba (*Azadirachta indica* A. Juss.) [12-15]. By virtue of this anti-oxidant property they help to protect the diseased liver due to free radical overload. *Tinospora cordifolia* an important ingredient of PKT is established as an immune-modulator, so it is useful in improving the immunity against viral infection. Further Improvement in the clinical symptomatology as in appetite and digestion is also contributed by PKT which is a rational combination of herbs to enhance digestive fire. Biochemical parameters also indicate that these drugs are having the capacity to correct the metabolic process [16-18]. Kupffer cells are well reported to causes hurdle in process of liver regeneration. Amrita, Kalmegha and Katuki have been proved to suppress the Kupffer cells, which are major determinant of outcome of liver injury [19-21].

Therefore the drugs under Phaltrikadi Kvatha helps in management of hepatitis by above mentioned mechanisms which have been proved by symptomatic relief and supported by laboratory investigations.

Conclusion

Above data showed that after intake of PTK. The patients experienced good relief in symptoms of Hepatitis B. Liver Function Test (LFT) revealed that there is positive changes in Bilirubin total, Direct Bilirubin, Indirect Bilirubin, Total Protein, SGOT, SGPT and Alk. PO_4s, Further negative HBsAg profile of 8 patients and HBV DNA of patients in the present study supports the valuable role of PKT in Hepatitis. Therefore present findings gave scientific evidence to classically mentioned indication of Phaltrikadi Kvatha as hepatoprotector. This valuable drug can be used in other hepatic disorders.

Table 6: Quartile score for HBV DNA in patients of Hepatitis.

HBV DNA	Quartile Score		
	25th	50th	75th
Before treatment (n=21)	11.45	142.00	12100
Follow up 1 (n=7)	1.40	21.40	110
Follow up 2 (n=6)	1.08	9.90	43.95

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