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An Ayurvedic Management of *Jalodara* (Ascites) with special reference to Hepatic Cirrhosis

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ABSTRACT

Jalodara is one of the types of *udara roga* caused mainly due to*mandagni*. *Mala samcaya* and *dosha samcaya* occurs because of *mandagni* which causes *srotorodha* of *udakavaha and rasavaha srotansi.* Further it vitiates *prana*, *apana*, *agni* and ultimately causes accumulation of *udaka* in the body mainly in *udara*, which is the cardinal feature of *jalodara*. According to modern medical science accumulation of free fluid in peritoneal cavity (ascites) occurs in the complication of disease hepatic cirrhosis, which can be correlated with *jalodara*.

Chronic liver disease or cirrhosis is prevalent worldwide and is a major cause of mortality affecting people in their most productive years in their life; it has significant impact on the economy as a result of premature death, illness and disability. In this sense, a standardized treatment protocol is developed from traditional Ayurvedic sources, supplemented by current research findings.

AIMS AND OBJECTIVES:

- To study the *hetu*, *samprapti* and *lakshana samuccaya* of *jalodara* as well as hepatic cirrhosis.
- To study and observe the efficacy and effectiveness of *ayurvedic*treatment in the management of *jalodara*

MATERIAL AND METHODS: In the present study, 20patients suffering from *jalodara* /hepatic cirrhosis were treated, with standardized *ayurvedic* treatment protocol. The results wereassessed in terms of changes in signs and symptoms, laboratory investigationsand child pugh grade score.

RESULTS: Highlysignificant($P<0.001$)results werefound in signs and symptoms such as-ascites, abdominal pain, pedal edema, general weakness, loss of appetite and nausea vomiting. Statistically significant ($P<0.05$) effect werefound in Laboratory investigationssuch as Hb%. S.bilirubin, S.albumin, S.G.P.T.,S.G.O.T., serum alkaline phosphatase and prothrombin time.

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CONCLUSION: This study highlights the significant effect of standardized*ayurvedic* treatment protocol on *jalodara* / hepatic cirrhosis.

KEYWORDS

Jalodara, Hepatic cirrhosis, Ayurvedic treatment

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INTRODUCTION

In *Ayurveda,* hepatic cirrhosis complicated with ascites is commonly related to the disease group "*udararoga"*. Among eight types of "*udararoga"* the most serious conditions are considered to be *jalodara* or *yakriddalyudara,*which can be interpreted as different varieties of hepatic cirrhosis complicated with ascites[1]. These nosological entities are described as having similar symptoms to another form of "abdominal disease" *(plihodara)* characterized by abdominal distention (due to splenomegaly), accompanied by weakness, anorexia, indigestion, constipation, excessive thirst, breathlessness, coughing, vomiting, syncope or coma and visible yellowish or indigo colored veins in the abdominal area[2] .

Hepatic cirrhosis represents the end stage of most chronic liver diseases, which can remain compensated for many years[3]. Decompensated cirrhosis can be characterized by the development of major complications like jaundice, variceal hemorrhage, ascites, or encephalopathy[4], of which ascites is the most common[5]. Established cirrhosis has a 10-year mortality of 34-66%, largely dependent on the cause of cirrhosis; alcoholic cirrhosis has a worse prognosis than primary biliary cirrhosis and cirrhosis due to viral Hepatitis[6]. Approximately 15% of patients with ascites die within the first 12 months after diagnosis and 44% within the first 60 months.[7]

AIMS AND OBJECTIVES:

1. To study the *hetu, samprapti* and *lakshana samuccaya* of *jalodara* as well as hepatic cirrhosis.
2. To study and observe the efficacy and effectiveness of *ayurvedic* treatment in the management of *jalodara* (hepatic cirrhosis complicated with ascites).

MATERIALS AND METHODS

SELECTION OF THE PATIENT

Patients were selected from Out-patient department (O.P.D.) as well as In-patient department (IPD) of P. D. Patel Ayurveda Hospital, Nadiad.

CRITERIA FOR DIAGNOSIS

Criteria for diagnosis were based on signs and symptoms of *jalodara*available in the *ayurvedic* classics and description of hepatic cirrhosisavailable in modern texts as well as following laboratory and scanning parameters.

- Alteration in liverfunction test
- Confirmation of the diagnosis by USG abdomen
- Classical signs and symptoms of the *jalodara* like *udarādhmāna, nānāvarṇa*

*rājiprādurbhāva*on *udara*, *udakapūrṇadṛtikśobhasaṁsparśa*, *parivṛttanābhi* etc.

- Clinical features of hepatic cirrhosis including abdominal distension, pedal edema, general weakness, loss of appetite and nausea.

INCLUSION CRITERIA

- Positive patient history and established diagnosis of hepatic cirrhosis according to international standards.
- Patients fulfilling the diagnostic criteria.

EXCLUSION CRITERIA

- Hepatic cirrhosis due to cardiac causes, inherited metabolic causes, haemo-chromatosis and Wilson's disease.
- Recent (≤ 3 month) life-threatening complications (like Encephalopathy and excessive gastrointestinal bleeding) and other major co-morbidities (like Insulin-dependent Diabetes Mellitus, heart diseases, renal failure etc.). Female patients having pregnancy, post delivery period or lactation period.
- Patients who were taking any psychiatric or other liver damaging medicines were excluded.

INVESTIGATIONS

- Hematological investigations includingliver function test, prothrombintime, Hb, ESR, T.L.C., D.L.C., RBS, serum electrolytes
- Routine and microscopic examination of urine
- USG abdomen

PLAN OF STUDY

After the confirmed diagnosis, 20 patients of *jalodara* (hepatic cirrhosis) were treated with following treatments.

TREATMENT

At the beginning of the hospitalization period, fine powder of dried fruit of *pippali* was administered orally in an increasing and tapering dose-pattern twice daily with milk as follows-

Day	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Dose [in grams] of *Pippali Curna* twice daily	1	2	3	4	5	5	5	5	5	4	3	2	1

Table 1 Scoring of the clinical features

No	Symptom	Grade 0	Grade 1	Grade 2	Grade 3
1.	**Oedema**	No Oedema	Slight Oedema on lower extremities	Severe Oedema on lower extremities	Anasarca
2.	**Loss of appetite**	+++ Appetite	++Appetite	+Appetite	Complete loss of appetite
3.	**General weakness**	No weakness	Mild weakness	Moderate weakness	Severe weakness

Table 2 Child-pugh classification of prognosis in cirrhosis

SCORE	**1**	**2**	**3**
Encephalopathy	None	Mild	Marked
Serum Bullirubin	< 2 mg/dl	2-3 mg/dl	>3 mg/dl
Serum Albumin (in gm %)	> 3.5	2.8-3.5	< 2.8
Prothrombin time (Seconds prolonged)	< 4	4-6	> 6
Ascites	None	Mild	Marked

Add the individual scores: <7 = Group A; 7-9 = Group B; > 9 = Group C

Table 3 Survival chances in cirrhosis

Child-pugh grade	**Servival chances (%)**			
	1 year	**5 years**	**10 years**	**Hepatic deaths*** **(%)**
A	82	45	25	43
B	62	20	7	72
C	42	20	0	85

* Include hepatic failure, gastrointestinal bleeding and hepatocellular carcinoma.

In the morning of the 14th day, mild purgation was performed by oral administration of finely powdered dried rhizomes and roots of *katuki*with warm milk in varying doses from 3-6 g according to the patients´ individual sensitivity to purgatives (*koshtha*).

For the next 4 weeks following Ayurvedic medicaments were given orally.

1. *Punarnavadikvatha* 40 ml twice a day (containing equal parts of *punarnava, daruharidra, Patola, Haritaki,Nimba, Guduchi, Sunthi, Katuki*)
2. Compound powder containing *sharpunkha*-2grams *bhumyamalaki*-3grams *shvetaparpati*-500mgs twice a day with milk (*shvetaparpati*contains 1 part *navasara*, 16 parts *suryakshara* and 2parts *sphatika*)
3. *Bhringarajacurna*- 3grams twice with milk.

DIET

All the patients were kept only on milk diet for main treatment period and follow up period**.**

DURATION OF THE TREATMENT

All the patients were treated for 6 weeks in IPD as main treatment period. After completion of the main treatment period, all the patients were given above mentioned

oral medicaments (except *pippali*) in OPD for next 6 weeks.

FOLLOW UP

The 6 weeks of OPD treatment period was taken as follow up period. The patients were assessed every 15 days during this period.

CRITERIA FOR ASSESSMENT

All the patients were assessed before and after main treatment period as well as after follow up period according to the scoring of clinical features (Table 1) and Child-Pugh Grade Score (Table 2 & Table 3).

- Abdominal girth was measured in centimeters
- 24 hours urine output was measured in liters

Table4 Effect of an ayurvedic treatment on cardinal symptoms of 20 patients of Jalodara

Signs and symptoms	No of patients	Mean BT	Mean BT	%	SD	SE	't'	P
Oedema	19	02.37	01.05	55.56	00.95	00.22	6.06	P<0.001
General weakness	20	02.50	01.20	52.00	00.80	00.18	7.26	P<0.001
Loss of appetite	19	02.16	00.84	60.98	01.06	00.24	5.43	P<0.001
Nausea-vomiting	05	02.00	01.00	50.00	-	-	-	-
Abdominal pain	17	02.35	00.82	65.00	01.02	00.24	6.26	P<0.001
Ascites	20	02.26	01.11	51.16	00.50	00.12	10.06	P<0.001

STATISTICAL ANALYSIS:

Mean, percentage, ±S.D., ±S.E., 't' and P value were calculated. Paired't' test was used for statistical analysis.

The information gathered was analyzedstatistically in terms of mean (X), standard deviation (S.D.) and standard error (S.E.). Paired test was carried out at P<0.05, P<0.01 and P<0.001 levels. The obtained results were interpreted as:

Insignificant - P < 0.1

Significant - P < 0.05, <0.01

RESULTS AND DISCUSSION

Table 4: The mean score of ascites was 2.26 before starting the treatment, which was reduced up to 1.11 after completion of treatment by 51.16 % reduction. Oedema was 2.37 before starting the treatment and was reduced up to 1.05 (55.56 %) reduction. General weakness was reduced from 2.5 before treatment up to 1.2 (52 %) after the treatment. . Appetite was increased by 60.98% whereas nausea and/or vomiting wasreduced by 50% after treatment. Abdominal pain was 2.35 before starting the treatment, which was reduced up to 0.82 after the treatment by 65 % reduction. All

these results were statistically highly significant (P<0.001).

Table 5 Effect of an ayurvedic treatment on abdominal girth and urine output of 20 patients of Jalodara

Abdominal girth and urine output	No of patients	Mean BT	Mean BT	%	SD	SE	't'	P
Abdominal girth in cm	20	97.45	89.05	08.62	07.23	01.62	5.20	P<0.001
urine output in ml	20	897.5	1390	54.87	448.5	100.3	4.91	P<0.001

Table 6 Effect of an ayurvedic treatment on Laboratory investigations of 20 patients of Jalodara.

Investigations	Mean BT	Mean BT	%	SD	SE	't'	P
Hb%	08.87	9.40	05.92	01.08	0.24	2.18	P<0.05
S.bilirubin	05.03	2.76	45.13	04.68	1.05	2.17	P<0.05
S.G.P.T.	44.50	33.05	25.73	24.47	5.47	2.09	P<0.05
S.G.O.T.	77.30	61.35	20.63	31.96	7.15	2.23	P<0.05
S.Alkaline phosphatase (IU/L)	209.7	193.4	07.78	30.42	6.80	2.40	P<0.05
S. Protein (mg/dl)	06.43	6.82	05.99	00.80	0.18	2.15	P<0.05
S.Albumin (mg/dl)	02.81	03.16	12.46	00.67	0.15	2.33	P<0.05
S.Globulin (mg/dl)	03.62	03.68	01.52	00.67	0.15	0.37	P>0.05
Prothrombin time -test	16.06	14.57	09.25	00.95	0.21	6.97	P<0.001

Table 5: The mean score of abdominal girth in centimeter before starting the treatment was 97.45 which was reduced up to 89.05 (8.62 %) after treatment. Urine 24 hrsoutput was 897.50 ml before treatment which was increased up to 1390 ml after completion of the treatment by 54.87 % increase. Both of these effects were also statically highly significant (P<0.001).

Table 6: Hemoglobin was increased by 5.92 % whereas serum bilirubin was reduced by 45.13 %. S.G.P.T. and S.G.O.T. were reduced by 25.73% and 20.63% respectively. Serum alkaline phosphatase was reduced by 7.78% whereas serum total protein was increased by 5.99% after completion of the treatment. On statistical view point this result was significant (P<0.05).Serum albumin and serum globulin were increased by 12.46% and 1.52%, respectively. Prothrombin time was reduced by 9.25% after the treatment. All these beneficial effects except increase in serum globulin (which is not expected) were statistically significant (P<0.05).

Table 7: Assessment shows that before starting the treatment 15 out of 20 patients were in group C (which includes patients

having maximum severity) of child pugh score and 05 patients were in group B (which includes patients having moderate severity of the disease). No patient was in group A which includes the patients having minimum severity of the disease. After completion of the treatment no patient remained in group C. Ten patients remained in group B with moderate severity and 10 patients moved to group A with minimum severity.

Table 7 Changes in groups of patients according to child pugh score after treatment

Groups	No. of Patients B.T.	No. of Patients A.T.
Group A	00	10
Group B	05	10
Group C	15	00

Further improvement in signs and symptoms as well as in laboratory investigations was found after follow up period. Child pugh score shows that at the end of the main treatment 10 out of 20 patients were in group B with moderate severity of the disease and 10 patients were in group A with mild severity. No patient remained in group C with maximum severity of the disease. After completion of the follow up period only o4 patients remained in group B whereas 6 more patients (total 16) moved to group A with mild severity of the disease.

The *samprapti* of *udara roga* starts with *mandagni* which leads mala *sancaya* and *dosha sancaya* in the body. This causes extensive *srotorodha* which results in *jalodara*. *Mala sancaya* in the body is considered as type of ama[8]. *Pippali* has *dipana* and *pachana* actions[9] which improves *agni* and causes *amapachana* hence the treatment was started with *vardhamana pippaliprayoga*.

Mridu virechana is to be performed after *ama pachana* in the treatment of *ama*[10]. Since *katuki* has *pitta virechana* action, it was used for *Mridu virechana* because *pitta sancaya* occurs in the disease.

Apadosha sancaya is another major event occurs in the *samprapti* of *jalodara* hence its *nirharana* is indicated as a treatment[11]. Since *mutra* flows *udaka* out of the body[12], *mutravirechana* everyday is also indicated in the treatment of *jalodara*[13]. *Punarnavadi kvatha* is indicated in *sarvanga shotha* as well as in *udara roga* whereas *shvetaparpati*consists of *ksharas* which are indicated in *caraka samhita* for the treatment of *jalodara*. Its *mutrala* action is well accepted.

Liver gets damaged in cirrhosis hence use of the drugs having *rasayana* effect on it can prevent further damage and helps in the regeneration of the damaged cells of the liver. *Sharpunkha*is indicated especially in the treatment of liver and spleen disorders.

Bhumyamalaki and *bhringaraja* both have *rasayana* properties as well as both are commonly used in the treatment of liver disorders. Considering these facts all these three *aushadhani* were also used in present study.

Nitya mutravirecana is suggested by the classical *ayurvedic* texts in the treatment of *jalodara*. This is achieved by the use of *Punarnavadikvatha*a and *shvetaparpati*in present study. Both of these formulations increase urine output which reduces ascites and causes reduction in abdominal girth. It also reduces oedema.Correction of *agni* by *dipana* and *pacana* actions of *pippali* can revert the disease process and *rasayana* drugs used in the treatment also helps in improving qualities of deteriorated dhatus. With the improvement of status of the *dhatus*, general weakness is relieved.*Sharpunkha*, *Bhumyamalaki* and *bhringaraja* used in this study have *rasayana* effects on liver, which reduces damage in liver tissues and helps to improve their quality. With this, liver function is improved, which is evident by reduction in S.G.P.T., S.G.O.T., serum bilirubin, serum alkaline phosphatise and prothrombin time as well as increase in serum protein (mainly serum albumin) and haemoglobin after treatment.

Child pugh grade score is distribution of the patients of hepatic cirrhosis based on the severity of the disease. The patients are distributed in three groups i.e. group A, group B and group C. Group A includes patients having mild severity, group B includes patients having moderate severity and group C includes patients having mild severity of the disease. Before starting the treatment 05 patients out of 20 were in group B and 15 patients were in group C, whereas no patient was in group A. After completion of the treatment 10 patients were in group B whereas 10 patients moved to group A. No patient remained in group C. This shift of the patients towards less severe groups is encouraging. It indicates improvement of the prognosis of the disease also.

CONCLUSION

Ayurvedic management is effective in reducing sign and symptoms of the *jalodara* i.e., hepatic cirrhosis complicated with ascites. it also reduces the severity of the disease as majority (16 out of 20) of the patients came in to the mild severity group from moderate and maximum severity groups of child pugh grade score after treatment.

No any unwanted effect noticed during the entire study period.

ETHICS COMMITTEE APPROVAL NO- JSAM/IECHR/38/13-2015

CLINICAL TRIAL REGISTRY NO - CTRI/2015/11/006361

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