ROLE OF GUDUCHI KSHEERA BASTI IN EVALUATING THE LEVELS OF SR. AMMONIA AND LFT’S IN ALCOHOLIC LIVER DISEASE- A CASE STUDY

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ABSTRACT
There are 3 types of liver disease related to alcohol consumption: fatty liver, alcoholic hepatitis, or cirrhosis. Fatty liver disease occurs after acute alcohol ingestion and is generally reversible with abstinence. Alcoholic hepatitis is an acute form of alcohol-induced liver injury that occurs with the consumption of a large quantity of alcohol over a prolonged period. Cirrhosis involves replacement of the normal hepatic parenchyma with extensive thick bands of fibrous tissue and regenerative nodules, which results in the clinical manifestations of portal hypertension and liver failure. Material and method: 38 years alcoholic male patient with features of ALD Results: Patients started improving within 3 days, pt’s ammonia decreased to almost normal in 5 days, with decrease in biochemical tests. Discussion: Most questions arises whether ALD with hyperammonemia be cured with ayurvedic treatment? If yes, which? To what extent? And how much time? Recent cases of various ALD with hyperammonemia treated at SGAK. This evidence based presentation will prove the point that liver diseases like ALD and hyperammonemia can be treated with Ayurveda. In such cases, Ayurvedic treatment gives relief from the associated complaints ALD with hyperammonemia can be correlated with madatayaya and kamala.

KEYWORDS: Basti, hyperammonemia, madatayaya, kamala.
INTRODUCTION
Liver is referred to as ‘Yakrut’ in Ayurveda. It is appropriately discussed in Ayurvedic texts. Liver is the most important and the largest internal organ of our body, essential for our survival. It performs more than 500 functions combined with other organs. Because of its strategic, location and multidimensional functions, it is connected to almost every organ in our body. Its function cannot be replaced or outsourced, in terminal cases liver transplant is the only option to which unfortunately not many people have an access. The description of diseases of organs like liver, kidney, brain, etc. and their diseases is not like that of conventional medicine; hence we don’t find a separate mention of those diseases in separate chapters in Ayurveda, they are dealt with dosha philosophy. Several biochemical tests are useful in the evaluation and management of patients with hepatic dysfunctions.\cite{1} These tests can be used to [a] detect the presence of liver disease, [b] distinguish among different types of liver disorders, [c] gauge the extent of known liver damage, and [d] follow the response to treatment. The Liver carries out thousands of biochemical functions, most of which cannot be easily measured by blood tests. Laboratory tests, measures only a limited number of these functions.

The tests which are usually employed in clinical practice include the bilirubin, aminotransferase, alkaline phosphatase, and albumin and prothrombin time tests. When more than one of these tests provide abnormal findings, or the finding are persistently abnormal on serial determinations, the probability of liver disease is high. When all tests results are normal, the probability of missing occult liver disease is low.

Tests based on detoxification and excretory functions: Sr. bilirubin, urine bilirubin, blood ammonia, sr. enzymes. Tests that measure biosynthetic function of liver: sr. albumin, sr. globulins, renal excretion of bilirubin conjugates.

Ammonia is produced in the body during protein metabolism and by intestinal bacteria, primarily those in colon.\cite{2} The liver plays a role in the detoxification of ammonia by converting it to the urea which is excreted by the kidneys, striated muscles also plays a role in detoxification of ammonia, which is combined with glutamic acid to form glutamine. Patients with advanced liver disease typically have significant wasting, which likely contributes to hyperammonemia in patients. Some physicians use the blood ammonia for detecting encephalopathy or for monitoring hepatic synthetic functions. There is a poor correlation between either the presence or the severity of acute encephalopathy and elevation of blood
ammonia; it can be occasionally useful for identifying occult liver disease in patients with mental status changes. There is also a poor correlation of blood serum ammonia and hepatic function. The ammonia can be elevated in patients with severe portal hypertension and portal blood shunting around the liver in the presence of normal or near normal hepatic function.

Ammonia in the human body is produced mostly as a byproduct of protein digestion and bacterial digestion of gut.[3] Kidney and muscle also generate significant amount of ammonia. Ammonia the toxic waste metabolite is resolved in liver where the urea cycle converts free ammonia to urea. Liver malfunction causes hyperammonemia that leads to CNS dysfunctions.

Alcoholic liver diseases and alcohol are considered burden on the family and society. When it comes to conservative treatment, conventional medicine has limited option and Ayurveda amongst the alternative system has proven the best. In Ayurveda context features of ALD correlates with madatyaya and kamala. Ayurveda has explained in detail about etiology, pathogenesis, and management of these diseases.

**Clinical Presentation**
A 38 years old male admitted patient presented in OPD with the following.

**Complaints:** anorexia, yellowish sclera, yellowish urine, abdominal pain, vomiting, mild fever since 15 days.

**K/C/O:** None

**Drug history:** None

**Personal history:** He is a chronic alcoholic and tobacco chewer, last alcohol consumption was 15 days ago.

**Physical examination:**

**Pallor- +**

**Sclera-** Icterus ++

**Pulse-** 98/min

**B.P-** 130/90 mmHg

**R.S.-** AE B/L clear

**C.V.S-** S1S2 Normal

**C.N.S.-** Conscious, oriented

**P/A-** Pain with tenderness noted over rt. Hypochondriac and epigastric region.

**Mala- Malavashtamba** since 2 days
**Mutra-** Peetamutrata

**Jivha-** Saam

**Dosha-** Vata, Pitta,kapha

**Dhushya-** Rasa, Rakta

**Agni-** Manda

**Koshta –** Krura

**Prakruti-** Sharirik Prakriti- Vata,Pitta

**Mansika Prakriti-** Rajas.

Patient was then admitted in IPD ward 2 under *Kayachikitsa* department. We had a Sr. Ammonia level and LFT’s done as a part of routine ALD evaluation. He did not have any confusion, insomnia or decreased mental alertness.

Jaundice was noted clinically with deranged LFT’s, No tenderness noted on his abdomen Exam. USG s/o ALD and fatty infiltration of liver. The patient is conscious and oriented with no symptoms of encephalopathy, but his Sr. Ammonia is 248. And total bilirubin 7.57 g/dl. The diagnosis alcoholic liver disease was made on clinical ground supported with Ultrasonography and blood biochemistry reports.

He received *guduchiksheer basti* 200ml for 5 consecutive days. During the treatment, the patient was completely on cessation of alcohol. Throughout the treatment, the patient was advised to avoid the spicy, oily, salty food.

This is a case study evaluating the role of *guduchiksheer basti* in hyperammonemia and deranged LFT’s in ALD.

**AIM:** To evaluate the efficacy of *Guduchiksheera basti* in the management of Sr. Ammonia and LFT’s.

**MATERIALS AND METHODS**

1. The present study was an observational clinical study with pre and posttest design

2. *Bruhatrayi’s* and *Laghutrayi’s*.

3. Various texts like Harrison’s, Davidson’s principles of internal medicine.

4. Relevant articles published in various national and international journals.

5. Collection of all references is done and correlation between the data is done logically i.e. by using *yukti pramana*. 
Treatment

1. **Guduchiksheer basti** 200 ml daily X 5 days

**Formulation:** The formulation selected were

1. Ghrut – 20gm
2. Makshika- 40gm
3. Til oil- 20ml
4. Ksheer-150ml
5. Water- 150 ml
6. Guduchi- 30gm

**Guduchi**

*Guduchi*[^4] – Rasa- Tikta,Kashya
Guna – guru, snigdha
Veerya- ushna,
vipaka- madhura
Doshaghna –Tridosh Shamaka ;
snigdha, ushna- vatashaman;
tikta,kashaya- kapha pitta shaman
karma- pittasaraka, dipana, pachana, anulomak etc
Rohghanta – yakrut vikara, kamala etc.

**Makshika**

It helps forms a homogenous mixture. *Makshika* has predigested sugar and it is easy to digest and easily absorb by the body.

**Sneha**

Owing the snigdhaguna, it produces unctuousness in the body which in turn help for easy elimination of dosha and mala. Sneha increases permeability of cell membrane.

**Role of Basti**

Action of *basti* depends on the ingredients. *Basti* will reach nabhi pradesh, kati, parshva, kukshi. The veerya of *basti* spreads throughout the body, interacts with the *doshas* and expels *doshas* completely without complications.[^5] The veerya of the given *basti* is immediately transferred to apana vata, from apana to samana, then to vyan and then to udana and to
prana. Then to veerya reaches to *pitta sthana* and *kapha sthana* and bring them back to normalacy.[6]

Role of *guduchiksheer basti*[7] has been quoted in charak samhita chikitisa sthana in halimak vyadi.

2. *Kutki churna* 5 gm [Kutki] at Night

3. *Arogyawardhini vati 250mg* [main content kutaki] 2 tablets thrice a day

4. *Faltrikadi kwath* [Haritaki, bibhitaki,amalaki, guduchi, vasa, kutaki, chirayata, nimba] 20 ml twice a day.

5. *Kharjuradi mantha* 50-100 ml twice a day

6. **IV Fluids**-
   A) D5% + 3 amp. Optineuron
   B) D10% + 2 amp. Eldervit

**DISEASE REVIEW**

Alcohol is one of the most common causes of liver disease worldwide patients with ALD may also have risk factors for liver diseases e.g. Chronic viral hepatitis infection. An upper threshold of 14 units /week in women and 21 units /week in men is generally considered safe.[8]

The risk threshold for developing ALD is variable but begins at 30 g/day of ethanol. For many consumption of more than 80 g/day for more than 5years is required to confer significant risk of liver disease.

Table No. 1: shows: Amount of alcohol in an average drinks.

<table>
<thead>
<tr>
<th>Alcohol Type</th>
<th>% Alcohol by volume</th>
<th>Amount</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beer</td>
<td>3.5</td>
<td>568 mL</td>
<td>2</td>
</tr>
<tr>
<td>Wine</td>
<td>10</td>
<td>125 mL</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>750 mL</td>
<td>9</td>
</tr>
<tr>
<td>Alcopops</td>
<td>6</td>
<td>330 mL</td>
<td>2</td>
</tr>
<tr>
<td>Sherry</td>
<td>17.5</td>
<td>750 mL</td>
<td>13</td>
</tr>
<tr>
<td>Vodka/Rum/gin</td>
<td>37.5</td>
<td>25 Ml</td>
<td>1</td>
</tr>
<tr>
<td>Whisky/brandy</td>
<td>40</td>
<td>700 mL</td>
<td>28</td>
</tr>
</tbody>
</table>

*1 unit= 8g.*
Clinical Syndromes of ALD
1) Fatty liver
3) Cirrhosis

Ayurvedic Perspective of ALD:
In Ayurveda exact correlation cannot be found of alcoholic liver disease but according to signs and symptoms and pathology of disease we can consider this clinical entity as Madatyaya with Bahupitta kamla.

Bahupitta kamala
Ayurveda considers Kamala as a disorder of Raktavahastrotas. Yakrit and Pleeha are Moolasthana of Raktavahastrotas. Clinical features of Kostha shakhashrita kamla are Haridra Netra, twak [Yellowish discoloration of eyes, skin], Haridranakha, Aanana [Yellowish discoloration of nails and oral mucosa ], Raktamutrata, Peetashakrit [Dark colored urine, yellow stool], Dourbalya [weakness], Aruchi [anorexia], Avipaka [indigestion] Vitiated Pitta is the main causative factor in the pathogenesis of Kamala. Main causative factor of these disease is Agni Mandya, excessively irritating food [like alcohol etc.] strenuous exercise etc. that lead to development of jaundice in Ayurveda.

Table no. 2 shows: Comparison of Alcoholic Liver Disease with bahupitta Kamala.

<table>
<thead>
<tr>
<th>Alcoholic Liver Disease</th>
<th>Bahupitta Kamala</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Chronic alcohol intake</td>
<td>Teekshna oushradhi and Madhya sevana</td>
</tr>
<tr>
<td>2. Yellowish discoloration of eyes, skin</td>
<td>Haridra Netra, Twak</td>
</tr>
<tr>
<td>3. Yellowish discoloration of nails and oral mucosa</td>
<td>Haridra nakha, aanana [oral mucosa]</td>
</tr>
<tr>
<td>4. Dark colored urine, yellow stool</td>
<td>Rakta mutrata, Peeta shakrit</td>
</tr>
<tr>
<td>5. Generalized weakness</td>
<td>Dourbalya and angasaad</td>
</tr>
<tr>
<td>6. Anorexia</td>
<td>Aruchi</td>
</tr>
<tr>
<td>7. Indigestion</td>
<td>Avipaka</td>
</tr>
</tbody>
</table>

In Ayurvedic texts scholars with their treasure of knowledge and experience have scientifically explained the principles of management of Kamala. Acharya Charaka has mentioned “Kamale tu virecanam” i.e. purgation therapy with mridu and tikta dravyas. Acharya Sushruta mentioned drug and dieted regimens. The principle of management of Kamala can be classified in a broad sense Samshodhana and Samshamana
**Madatyaya** - Madatyaya Nidan, Lakshana and Chikitsa is described in 24th chapter of Charak Chikitsa Sthana and in 47th chapter of Sushrut Uttaratantra, Panatyayapratishedha. In Ayurveda, the varieties of disorders caused by the excessive and improper use of alcohol are well described and documented under one heading ‘Madatyaya’ or ‘Panatyaya’. It is a Sannipataja Vyadhi [caused by vitiation of all three Doshas – Vata, Pitta and Kapha]. It mainly vitiates Ojas, as Madya [alcohol] have opposite quality of Ojas. Alcohol is treated as poison [neurotoxic cerebral inebriant poison] when consume much more dose and as medicine in limited dose.

**Samprapti**

Excessive intake of madya + Dosh prakopaka Ahar Vihar

\[
\begin{align*}
& \text{Tridosha prakopa} \\
& \text{Rasavaha stroto avarodha} \\
& \text{Hruday drushti} \\
& \text{Manah kshobha} \\
& \text{Ojo guna nasha} \\
& \text{Manovahastrotodushti} \\
& \text{Madatyaya}
\end{align*}
\]

**Table no. 3: Comparison of Alcoholic Liver Disease with Madatyaya.**

<table>
<thead>
<tr>
<th>Alcoholic Liver Disease</th>
<th>Madatyaya samanya lakshana[16]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Chronic alcohol intake</td>
<td>1. Madhya sevana</td>
</tr>
<tr>
<td>2. Generalized weakness</td>
<td>2. Dourbalya</td>
</tr>
<tr>
<td>3. Anorexia</td>
<td>3. Aruchi</td>
</tr>
<tr>
<td>4. Indigestion</td>
<td>4. Avipaka</td>
</tr>
<tr>
<td>5. Nausea</td>
<td>5. hrillasa</td>
</tr>
<tr>
<td>6. vomiting</td>
<td>6. Chardi</td>
</tr>
<tr>
<td>7. insomnia</td>
<td>7. Prajagara</td>
</tr>
<tr>
<td>8. yawning</td>
<td>8. Jrbhita</td>
</tr>
<tr>
<td>10. Tremors</td>
<td>10. kampa</td>
</tr>
</tbody>
</table>
RESULT

Table No.4: Result of Lab tests.

<table>
<thead>
<tr>
<th>Labs</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sr. Ammonia</td>
<td>248</td>
<td>94</td>
</tr>
<tr>
<td>LFTs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Bilirubin</td>
<td>7.57</td>
<td>5.27</td>
</tr>
<tr>
<td>Direct Bilirubin</td>
<td>4.33</td>
<td>3.28</td>
</tr>
<tr>
<td>Indirect Bilirubin</td>
<td>3.24</td>
<td>1.99</td>
</tr>
<tr>
<td>SGOT</td>
<td>213.8</td>
<td>184.6</td>
</tr>
<tr>
<td>SGPT</td>
<td>56.6</td>
<td>76.6</td>
</tr>
<tr>
<td>Alkaline Phosphatase</td>
<td>180.2</td>
<td>146.3</td>
</tr>
</tbody>
</table>

DISCUSSION

❖ The features of bahupitta kamala and madatyaya strongly resembles to the features of alcoholic liver disease.

❖ By understanding the features of Madatyaya we can say that Madatyaya is not just an alcohol intoxication, dependence or withdrawal state, but it is the condition where multiple systemic dysfunctions are involved from immediate and acute manifestations to chronic and severe manifestations.

❖ Neurological, gastro-hepatic and cardio-pulmonary manifestations are the commonest features seen in the patients of Madatyaya which is also similar to the descriptions of alcoholism.

❖ Alcohol mainly affects the hepatic system of the person, which end up with cirrhosis of liver. This will give rise to many GIT related problems like anorexia, loss of appetite, abdominal pain, vomiting, constipation etc.

❖ Mostly 80% percent alcohol absorbed in small intestine and much more metabolized in liver that’s why it shows its toxic effect on liver and damages it.

❖ The current treatment for hyperammonemia in allopathic is antibiotics or lactulose that are designed to decrease the intestinal production of ammonia/its absorption into body, but are often accompanied by side effects like bloating, belching, abdominal discomfort etc.

❖ Absorption mechanism in G.I. Tract- the G.I. tract is lined with epithelial cells. Drugs must pass or permeate through the cells in order to be enhancers. The concentration of drug reaching the colon depends on formulaion factors.

❖ The human colon has over 400 distinct species of bacteria as resident flora and colonic contents.[17]
Considering the role of gut microbiota and physiological characteristics of the intestine, the removal of ammonia from intestine by modulating the gut microbiota will be an ideal approach to treat hyperammonemia. Thus this study we discussed the significance if *guduchiksheera basti* in the management of *hyperammonemia* and along with it treating ALD.

- It has taken 5 days to lower the level of ammonia and LFT’S.
- Drastic change was noted in before and after sr. ammonia reports.
- Basti and virechana has been proved best in lowering the results of LFT’s.
- *Yuuki pramana* is needed in understanding *doshas* according to symptoms and treating the disease.
- Treatment along with Counseling is one of the key lines in the management of alcoholism.
- *Ayurveda* is considered best among conventional medicines in treating diseases of liver.

**CONCLUSION**

During the treatment the patient was totally abstaining from alcohol. Within 5 days of starting the therapy patient showed significant improvement which were assessed by measuring liver functions through specific clinical features and laboratory parameters. Hence presenting this case is an evidence to demonstrate the effectiveness of Ayurvedic treatment in ALD to bring the levels of sr. ammonia and LFT’s to normal, which can prove an important guideline for treating Alcoholic Liver Disease with safe and effective Ayurveda line of management. It had no side effect or toxicity.

**REFERENCES**

1. Fauci, Braunwald, Harrison’s principes of internal medicine vol. II, 17th edition, page no. 1923
2. Fauci, Braunwald, Harrison’s principes of internal medicine vol. II, 17th edition, page no. 1924
8. Davidson principles and practices of medicine 23rd edition chapter 22 hepatology page no 880.