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AN AYURVEDIC VISION TOWARDS CHRONIC HEPATITIS 'B': A REVIEW STUDY

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ABSTRACT

Worldwide, two billion people have been infected with hepatitis B virus (HBV), 360 million have chronic infection, and 600,000 persons die each year from HBV-related liver diseases. HBV infections account for a disproportionately large share of worldwide morbidity and mortality. Ayurveda has many propositions to liver diseases which are akin to modern understanding of hepatology. Many chronically infected persons have mild liver disease with little or no long-term morbidity or mortality. Other individuals with chronic HBV infection develop active disease, which can progress to liver cirrhosis or hepatocellular carcinoma (HCC). As HCC has an increased mortality rate now-a-days due to no treatment available, so we are in search of such various hepato-protective drugs and their formulatory interventions to prevent and to manage various hepatic disorders and their complications. Ayurveda has various classical formulations and single herbs like Bhumyamalaki, Punarnava, Mustaka, Nagarmustaka, Daruharidra, Shyonaka, Kalmegha, Kutuki, Kakamachi, Bhringraja etc. which have been tested for thousands of years on people and have proved safe since ancient era. So, its main aim is just to be a helping hand to cure or to provide relief to the diseased ones.

KEYWORDS: Kamala, Kumbha-kamala, Chronic Hepatitis B, HbsAg, HBeAg.

INTRODUCTION

Hepatitis B infection is caused by Hepatitis B virus, a DNA virus which can cause acute or chronic infection.[1] Hepatitis B carrier is a term used to describe those who have hepatitis B surface antigen (HBsAg) in the blood for more than 6 months. Most of them have no symptoms and are unaware of their status as Hepatitis B carrier. Unfortunately, these otherwise healthy people can infect others without knowing it.[2]

The clinical manifestations of HBV infection in acute infection are either prodromal, or icteric[3] and recovery after the incubation period depends on the type of virus and its infectivity, patients clinically may present chills, headache, nausea, vomiting and may precede jaundice.[3-5] The liver becomes tender and enlarged with a right upper quadrant pain. Spleenomegaly and adenopathy may also occur in 10% to 20% of cases.[3] However, some do remain chronically infected especially with HBV and may progress to liver cirrhosis and/or to hepatocellular carcinoma (HCC).[3,4]

HEPATITIS B VIRUS

HBV is a DNA virus classified in the virus family Hepadnaviridae. Humans are the only known natural host. HBV enters the liver via the bloodstream, and replication occurs only in liver tissue. The intact, infectious virus is 42–47 nm in diameter and circulates in the blood in concentrations as high as 10^8 virions per ml. The inner core of the virus contains hepatitis B core antigen (HBcAg), hepatitis B antigen (HBeAg), a partially double-stranded 3,200-nucleotide DNA molecule, and DNA polymerase with reverse transcriptase activity. Hepatitis B surface antigen (HBsAg) is found both on the surface of the virus and as self-assembling, noninfectious spherical or tubular particles.[6]

EPIDEMIOLOGY

The World Health Organization (WHO) considers hepatitis B virus (HBV) to be second to tobacco among the carcinogens.[7] An estimated 350 million persons worldwide are chronically infected with HBV.[8] In the United States, there are an estimated 1.25 million hepatitis B carriers, defined as persons positive for hepatitis B surface antigen (HBsAg) for more than 6 months.[9,10] In India, the carrier rate has been found to be around 4-7% with an estimated 45 million infected individuals.[11]

Carriers of HBV are at increased risk of developing cirrhosis, hepatic decompensation, and hepatocellular carcinoma (HCC).[12] Although most carriers will not develop hepatic

complications from chronic hepatitis B, 15% to 40% will develop serious sequelae during their lifetime.[13]

TRANSMISSION

HBV is transmitted by percutaneous or mucosal exposure to infected blood or other body fluids. HBV transmission has been observed with numerous forms of human contact: perinatal/mother-to-child; household (nonsexual); sexual; needle-sharing; and occupational/health-care-related. The highest concentrations of infectious HBV are found in blood and serum. However, other serum-derived body fluids, such as semen and saliva, are also infectious.[14] Transmission of HBV can also occur in situations where there is frequent and prolonged close personal contact with an infected person.[15] HBV is efficiently transmitted by sexual contact.[16]

MATERIALS AND METHODS

For the present review detailed literary study is performed. The detail content and references are analysed from available literature. Principal texts referred are various modern books, internet, Charaka, Sushruta and Vagbhatta Samhitas etc. Also relevant references are taken from other available research articles.

MODERN REVIEW

HBV infection may result in subclinical or asymptomatic infection, acute self-limited hepatitis, or fulminant hepatitis requiring liver transplantation. Persons infected with HBV may also develop chronic HBV infection, which can lead to cirrhosis or hepatocellular carcinoma. The likelihood that newly infected persons will develop chronic HBV infection is dependent on their age at the time of infection.[17]

More than 90 percent of infected infants, 25–50 percent of children infected between 1 and 5 years of age, and 6–10 percent of acutely infected older children and adults develop chronic infection (i.e., they are HBsAg-positive but negative for immunoglobulin M antibodies to hepatitis B core antigen;). Immunosuppressed persons (e.g., hemodialysis patients and persons with human immunodeficiency virus infection) are also at higher risk of developing chronic infection.[18,19]

AYURVEDIC REVIEW

There are certain such disorders which are discussed thoroughly in our classical texts, but their direct pathological or clinical relationship with hepatitis B has not been mentioned and cannot be purely co-related. Some conditions in particular, fairly reasonably similar with Hepatitis B in their clinical pictures are *Kamala, Koshtha-ashrita kamala, Shakha-ashrita kamala, Koshtha-shakha-ashrita kamala, kumbha-kamala* etc.

Kamala is a vyadhi of the raktavaha srotasa whose moolas are Yakrita (liver) and pleeha (spleen). When pitta dosha gets vitiated, it leads to dushti of rakta and mamsa dhatus. In Chronic Hepatitis B (*Kumbha-kamala*), the various clinical features indicates that it is a vyadhi of the raktavhaya srotasa as-

1.	Jaundice	Kamala
2.	Spleenomegaly	Pleeha-vriddhi
3.	Oesophageal Varices (Haematuria / Haematemesis)	Rakta-pitta

Acharaya Charaka has also described Kamala in the 40 Nanatmaja diseases of Pitta dosha. It means Pitta dosha is always involved in Kamala roga and without its involvement Kamala roga cannot be produced.[20] In 28th chapter of sutrasthana, Acharaya Charaka has described Kamala in the diseases caused due to the morbid doshas situated in Rakta Dhatu (Rakta-pradoshaja vikara).[21] So, It is clear from the above observations that Kamala is a vyadhi of Raktavaha srotasa (raktaja roga).

Also, in the samprapati (pathogenesis) of *Kamala* roga, Acharya Charaka has mentioned that when the anaemic patient (*pandu rogi*) indulges in the Paittika Ahara and Vihara, then morbid Pitta causes *Dagdha of Rakta* and *Mamsa* and (Asriga Mamsama Dagdhva Rohgaye Kalpate) produces Kamala, specifically *Kostha-ashrita Kamala*.[20]

The pitta dosha gets vitiated by two means, one is achaya-poorvaka (without accumulation phase), and another is *chaya-poorvaka* (with accumulation phase). In *achaya-poorvaka* phase, there is no accumulation of doshas, they directly get aggravated (prakopa) and manifests the symptoms of kamala which can probably be co-related with **Acute Hepatitis B.**

On the other hand, in *chaya- poorvaka* phase, firstly there is accumulation of pitta dosha, which lie dormant for a long period in *sanchaya-awastha.* When pitta dosha get favourable conditions, it progressively leads to *prakopa* and then *prasara- awasthas*. If still not controlled, then it progresses to *sthana-sanshraya awastha*, where there is appearance of

poorvarupas, after which there is *vyakta-awastha* with manifestation of various signs and symptoms of kamala and ultimately leads to *Bheda-awastha* (complication phase) of Kamala called as ***Kumbh-kamala*** which can probably be co-related with **Chronic Hepatitis 'B'.**

Kamala*:** Kamala is one of those clinical entities which doesn't appear to have a relevant bearing with the actual pathogenesis of the disease. In Ayurveda classics the *Nidana* of Kamala has been described. Acharaya ***Charaka described Kamala as sequelae of *Pandu Roga* (anaemia). However *Pandu* may precipitate Kamala through different mechanisms. (i) By excessive use of irrelevant life style and dietetic factors; (ii) Excessive use of factors which may excite the Pitta dosha in a patient of *Pandu Roga*, whose Pitta activity is already deranged. Acharaya ***Sushruta***, the father of ancient Indian surgery has accepted *Kamala* not only as one of the complications of Pandu but also in association of other diseases.

Classification of Kamala Roga

S.No.	Name of Acharaya	Type of Kamala
1.	***Charaka***	*Kosthashrita Kamala, Shakhashrita Kamala*
2.	***Sushruta***	*Halimaka, Panaki, Kumbha, Lagharaka*
3.	***Vagbhatta***	*Swatantra Kamala, Pratantra Kamala*

In the *Samprapti* of *shakha-ashrita Kamala*, *Charaka* mentions that *Kapha sammurcchita-Vayu* throws away *Pitta* from its normal place and thus *shakha-ashrita Kamala* is produced. Further, it is mentioned that the passage of Pitta is obstructed by the *Kapha* and due to this, *Sakha-ashrita Kamala* is produced. Therefore, it has been suggested that while treating this disease, first *Kapha* should be treated to remove the obstruction in the passage of *Pitta*.[20]

Kumbha-Kamala

Kumbha-Kamala is a clinical condition described by most of Ayurvedic texts after the description of *Kostha-ashrita Kamala*. According to *Chakrapani*, *Kumbha-Kamala* is a particular stage of *Kostha-ashrita Kamala*. By close perusal of all the Ayurvedic literature available on *Kumbha Kamala*, it can be postulated that a long standing (*Kalantara* according to *Charaka*) case of *Kostha-ashrita Kamala* when develop complications ultimately leads to *Kumbha-Kamala*.[20]

CLINICAL MANIFESTATIONS

In Acute hepatitis B, for newly infected persons, the average incubation period (i.e; time from exposure to onset of jaundice) is 90 days (range: 60–150 days).[22,23] The likelihood of

developing symptoms of hepatitis as a result of a new HBV infection is age-dependent. Over 90 percent of perinatal HBV infections are asymptomatic, while the typical manifestations of acute hepatitis are noted in 5–15 percent of newly infected young children (1–5 years of age) and in 33–50 percent of older children, adolescents, and adults.[14]

Persons with **acute hepatitis B** can show signs and symptoms that include nausea, abdominal pain, vomiting, fever, jaundice, dark coloured urine, changes in stool color, and hepatomegaly or splenomegaly. The first serologic markers to become detectable in persons with acute HBV infection are HBsAg and antibodies to hepatitis B core antigen. In the 6–12 months after infection, immunoglobulin M antibodies to hepatitis B core antigen become undetectable.[24,25]

Chronic HBV infection is defined as either the presence of HBsAg in the serum for at least 6 months or the presence of HBsAg in a person who tests negative for immunoglobulin M antibodies to hepatitis B core antigen.[26] Unlike persons who recover from acute HBV infection, persons with chronic HBV infection do not develop anti-HBs, and HBsAg typically persists for decades.[27]

Although chronically infected persons with HBV, they develop the HBV-related sequelae of cirrhosis or hepatocellular carcinoma which may be asymptomatic until diagnosis, or they may encounter periodic flare-ups of signs and symptoms of acute hepatitis. Extra-hepatic complications can also occur, including polyarteritis nodosa, membranous glomerulo-nephritis, and membrano-proliferative glomerulonephritis.[28]

Kamala: Acharaya Charaka has described various clinical features of Kamala Roga as:[29]

S.No.	Sanskrit	English meaning
1.	*Haridra-netra*	Yellowness of eyes
2.	*Haridra-twak*	Yellowness of skin
3.	*Haridra-nakha*	Yellowness of nails
4.	*Haridra-anana*	Yellowness of face
5.	*Rakta-Pita Sakrta*	Yellow stool with blood
6.	*Rakta-Pita Mutra*	Yellow urine with blood
7.	*Bheka Varna*	Complexion like a frog in rainy season
8.	*Hatendriya*	Exhausted senses
9.	*Daha*	Burning sensation
10.	*Avipaka*	Indigestion
11.	*Daurbalya*	Weakness
12.	*Sadana*	Laxity of the body (fatigue)
13.	*Aruchi*	Anorexia
14.	*Karishta*	Emaciation

- Acharaya **Sushruta** has also named Halimaka, Lagharaka, Alasa, Panaki and Kumbha-Kamala as the different stages of kamala.[30]
- Halimaka: It is a clinical entity first described by Acharaya Charaka in which a patient of Pandu Roga develops Harita (greenish), Pita (yellowish) etc. colour of the body.
- Chakrapani Datta while commenting on these verses has indicated that Lagharaka and Alasa described by Sushruta are the synonyms of Halimaka.
- Further Chakrapani while commenting on the same verses has also indicated that Panaki, a disease described by other authors, is a particular stage of Kamala.
- Further it has been mentioned by Dalhana that the Panaki described by other tantras is a particular stage of Kumbha-sahya i.e. Kumbha-Kamala.

Kumbha kamala

Acharya Charaka stated that in long standing Kamala, when there develops rookshata (dryness) in various dhatus, it becomes kriccha sadhya and leads to **Kumbha kamala**. Kumbha kamala presents with further symptoms like krishna-pita shakrita mutra, raktamutra, shotha, chardi, daha, aruchi, trushna, anaha, moha, nasht agni is considered as asadhya.[31]

According to Sushruta Samhita, kumbha-sahya is type of kamala with shotha and parvabheda.[32] Ashtang Hridaya also explained that untreated kamala leads to the next stage called kumbha-kamala which is kriccha-sadhya.[33]

MANAGEMENT OF CHRONIC HEPATITIS B

- **Modern management**

In modern science, there are licensed vaccinations for viral hepatitis as(34)

Feature	PEG IFN	Lamivudine	Entecavir	Telbivudine	Tenofovir
Route of administration	Sub-cutaneous	Oral	Oral	Oral	Oral
Duration of therapy	48-52 weeks	> or = 52 weeks	> or = 48 weeks	> or = 52 weeks	> or = 48 weeks
Dose	100 mcg weekly for 32 weeks + 50 mcg weekly for 20 weeks	100 mg daily	0.5 mg daily	600 mg daily	300 mg daily

But still there is higher incidence and prevalence of these diseases and also the patients are at increased risk of developing hepatic cirrhosis, hepatic decompensation, and hepatocellular carcinoma (HCC).

- **AYURVEDIC MANAGEMENT**

The principle of management of these diseases differs in Ayurveda, from western modern medicine. It is the Acharya *Bhavamishra* who for the first time introduced the term '*Yakritvikara*' to denote various disorders connected to it. A detailed description of *Yakritvikara* with its classification is available in his treatise *Bhavaprakasha*.[35]

The first line of treatment adopted for the Yakrit-Rogas comprise of the measures used for the pacification of Pitta dosha and purification of rakta dosha.[36] The treatment of *Yakrit-Rogas* (*Kamala* and *kumbha-kamala*) includes drugs having *pitta* pacifying *rasas, shothhara, anulomana,* and *deepana-pachana gunas* which may help in normalizing the agni and level of pitta in the body.

Secondly, drugs with *tikta rasa* predominance have *Rakta-shodhak* properties, so they can be used as kamala is a *vyadhi* of the *raktavaha srotasa*. Also, *tikta rasa* predominant drugs being *sheeta* in nature help in controlling the vitiated *pitta dosha*.

But Ayurveda has a lot of hepatoprotective drugs, which can fill up this gap like *Bhumyamalaki, Punarnava, Kutuki, Kakamachi, Shyonaka, Mustaka, Nagarmustaka, Daruharidra, Kalmegha, Bhringraja* etc. have been suggested to be useful in various liver disorders. *Totala (Shyonaka)* is used as a folk-lore drug in south-india for liver disorders.

DISCUSSION

Punarnava, Bhumyamalaki, Shyonaka and *Kakamachi* have such *gunas,* and they may probably participate in the *samprapati vighatana* of the diseases.

Punarnava

Punarnava has *tridoshahara, shothhara, anulomana, rasayana* gunas[36] and having *katu, tikta* rasa predominance along with *madhura Vipaka*, so it acts as *pittashamaka* in nature**.**[37]

Bhumyamalaki

In the same way, *Bhumyamalaki* being hepatoprotective has *Yakrit-uttejaka, pittashamaka, deepana-pachana,* and *anulomana gunas* which acts on liver effectively**.**[38]

Kakamachi

It is *tridoshghana, Yakritauttejaka, Katuposhtikka in nature* so acts on liver disorders.[39]

Also, ***Shyonaka*** has *katu, tikta rasa* predominance along with *Pitthara* and *sothahara* karma, so it acts so useful in hepatitis.

Some of these drugs have *rasayana* gunas and others are *katuposhtikka* in nature. So these drugs collectively help in the *dhatuposhana* of various vitiated dhatus.[40]

Thus Ayurvedic literature presents an extensive description of hepato-biliary diseases and their Ayurvedic Management. Certain herbal drugs described in Ayurvedic classical texts for the management of such disorders are proved beneficial. So, various clinical trials should be done on these drugs which will be very encouraging, helpful and warranting further studies for main stream use.

CONCLUSION

This literature reviewed study is a step in the series of development in the field of Ayurveda to find satisfactory solution in treatment of hepatic diseases like Chronic Hepatitis B which pose a strong challenge in the present era. A scientific approach is needed to evaluate and to establish efficacy of this combination for this specific targeted study have to be further carried out.

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