



Review Article

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A Review Article on Toxicity Induced Hepatocellular Carcinoma: Through Gara Visa perspective

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ABSTRACT

Hepatocellular carcinoma is the most common primary malignancy of liver in adults and is the common cause of death in people with cirrhosis^[1]. The majority of this disease occurs over pre-existing chronic liver cirrhosis but the increased changes in living conditions, food habits and sedentary life style has emerged the disease into a silent killer category independent of cirrhosis. The present modifications in food habits, drug induced toxicity and other environmental toxicity has led to a dramatic rise in HCC even in non-alcoholics. The symptoms and pathogenesis in HCC can be eventually be correlated with Garavisa Lakshana, Samprapthi and the judicious application of its treatment in Ayurveda can concrete a new path in its treatment aspect.

Keywords: Toxicity induced HCC, Gara visa.

INTRODUCTION

The word *Gara* is derived from the root word 'Gru' with 'Ach' suffix that means 'to deglute' or 'could be degluted'.

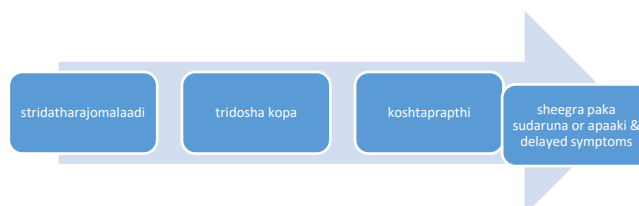
As per the ancient literature *Gara* is considered to be a form of *Krithrima Visha* ie a combination of two or more poisonous (artificial sweeteners, flavouring agents) or non-poisonous substance (*Virudha Ahara*)^[2] which exerts a toxic effect on body by vitiating *Dhatu*s.

This includes different body parts of insects, menstrual blood, urine, faeces etc of human and animal origin. Medicines having diametrically opposing action on the same physiological system, *Virudhahara*, ashes of metallic or mineral origin, poisons of low potency etc can also be included under *gara*^[3]. *Charaka Acharya* classified this under *Samyogaja Visa* and is *Kalaantara Vipaki* since it takes long time for this type poison to get metabolised. *Susrutha Acharya* explained this concept in *Keeta Kalpa Adhyaya* with an entirely different concept of transdermal application of *Gara Yogas*^[4]. The *Vishishta Guna* of *Gara* ie *Apaki* and the cumulative period of toxicity is about 15 to 30 days are explained by *Madhukosa* and *Yogaratanakara* respectively. The Kerala *Visha Chikilsa Granthas* expounded this under the reference of *Kaivisham* with its prime motive as *Vashyartham & Vairartham*.

PROBABLE MODE OF ACTION

Basically it depends on combination of poison, dose and route of administration. If ingested it produces systemic toxicity and if applied externally it acts trans-dermally. As per the classification, *Gara* is of two types *Savisha Samyogaja* and *Nirvisha Dravya Samyogaja*. If the combination is *Nirvisha Samyogajam* it is not metabolised properly and later produce defective biotransformation triggering in basic pathologic reaction as like in *Virudhaahara*.

Samprapthi



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Gara Visa concepts in Toxicity induced Hepatocellular carcinoma

Hepatocellular carcinoma is the primary malignancy of liver. It is the third leading cause of cancer death world-wide. Annual mortality and incidence are virtually identical due to its high case fatality rate. Its incidence in India among male accounts for 0.7 to 7.5 and for female 0.2 to 2.2 per 100000 population per year [5].

The major causative factors for HCC are

- Hepatitis B & C infections
- Non-alcoholic Steatohepatitis
- Alcohol induced hepatitis
- Aflatoxin toxicity etc

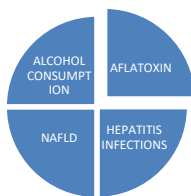
Aflatoxins are food contaminants produced by fungi *Aspergillus flavus* & *Aspergillus parasiticus*. The main food sources of its contamination are maize, dried fruits, meat, spices, oil seeds and milk.

The Aflotoxin toxicity detected in milk by FSSAI milk survey in recent days reminisces the importance of daily toxic exposure to human beings [6]. Both toxicity and carcinogenicity is being studied experimentally for which acute aflotoxicosis results in death. Chronic aflatoxicosis mainly includes prolonged pathologic changes in liver including cancer and immune suppression. The basic mechanism of action of this toxicity includes tumour promotion or progression ie activation of proto oncogenes and mutation in tumour suppressor genes p53 [7].

PATHOGENESIS OF HCC



Contributing factors [8]



Hepatocellular carcinoma [9]	Garavisa
weight loss reduced appetite nausea & vomiting	<i>Krsha Alpaagni</i>
Fever	<i>Kasa Swasa Jwaraadi</i>
Right upper quadrant pain	<i>Pratiloma gati of Vayu</i>
Anemia bleeding tendency	<i>Pandu</i>
Feeling of exhaustion	<i>Durbala Alasa Deena Vak</i>
Ascites	<i>Mahodara</i>
Hepatomegaly & splenomegaly	<i>Yakrt Pliha Roga</i>
Ankle edema & feeling of fullness	<i>Sopham Adhmana Suska Pada Kara, Kshayi</i>
Jaundice chalky white stools & darker urine	
Pruritis	
Hard to detect as symptoms don't appear until progress significantly	<i>Chirat Chiratharat Cha Tat</i>

Proposed treatment plans

Here we can adopt treatment principles of both *Dooshivisha* and *Gara Visa* since the disease remain latent in the body for a long time and manifest symptoms at its advanced stage.

Yat Sthavaram Jangamakrithrimam Va Dehadasheshamanirgam... Dushivishamupaithi [10].

The treatment includes

Shodhana Chikilsa-

- *Vamanam* – to expel out the unmetabolised toxic substances in the stomach.
- *Virechanam* – Biopurification that enhances toxicity elimination at cellular level and to help in stopping mutation process through actions at check points.

Samana Chikilsa

- *Moorvadi Churnam* – help in metabolic correction through action at *Dhatu* level (*Dhatvagni Mandya*) as liver is the primary target organ or toxicity.
- *Dooshivishari Agadam*- while analysing the drugs of the yoga the main ingredient piperine help in inhibiting the cytochrome p450 and enhances the bioavailability of drug. Almost all the drugs have anti-cancerous properties with some hepatoprotective in nature such as *Kushta Eladi*. The probable mode of action as explained by *Susrutha Acharya* in *Nibandha Sangraha teeka* as *samana* and *prasadana* ie

'Anirhathasya Vishaavasheshasya Samshamanartham'
'Visha Dooshitha Dhatunam Prasamanartham'.

DISCUSSION

The modern treatment options for HCC are very limited since 70% of patients are inoperable due to its advanced stage and may be associated with any underlying liver pathology. The treatment modalities mainly include surgery i.e. liver resection or transplantation, local ablative therapies, radiotherapy, chemotherapy etc. and supportive care. Among these radiotherapy, chemotherapy are generally ineffective. Hence newer treatments and early diagnosis and intervention is a need for a better prognosis in such cases.

Ayurvedic treatment options are very unique for disease prevention and to disrupt its further progression. The basic principle of *Ayurveda Chikitsa* lies in *Agni* correction or *Amapachana* what we can be modernly say it as metabolic correction. *Vaiswanara Choornam* is one among those that helps in correcting *Agni* there by correcting the metabolic function of liver. In fact *Amapachana* or elimination of toxicity from our body is the basic of all our treatments and *Agadatantra* is a branch of our science contributing formulations having magical actions. Various combinations of drugs have proven its hepato-protective activity and also found helpful in hepatocellular regeneration. In *Madatyaya Chikitsa*, enormous amount of *Yogas* has been elaborately mentioned that facilitates the quick elimination of acetaldehyde and preclude alcohol induced liver injury.

The best part of our treatment principle is that not a single choice of drug is effective in every condition or in every individual and it is the *Yukthi of Vaidya* to find out the best medicine considering the *Roga – Rogi Avastha* and *Prakrthi*.

The present lifestyle modifications and diet contribute a lot in diseases like HCC and our role in its treatment can be designed from its grass root level itself. Following regimens of *Dinacharya* and *Rtucharya* and *Shodhana Chikitsa (Yadha Kalam)* helps in mitigating *Dosha* and elimination of toxicity in our body. *Yakrt Roga Chikitsa* in Ayurveda mainly includes *Pitha Dosha Shamana*, *Raktha Prasadana* and drugs mentioned in the treatment mostly are *Shothahara*, *Anulomana* and *Dipana- Pachana* which help in correcting *Agni* and *Pitha Dosha* in our body. The drugs that we commonly use in *Yakrt Vikaras* like *Amalaki*, *Punarnava*, *Katuki*, *Guduchi*, *Bhumi-amalaki*, *Bhunimba* etc are both scientifically proven as anti-cancerous and hepato-protective.

The basic treatment principles in *Gara Visa Chikitsa* along with *Yakrt Roga Samana* drugs prudently in combination can eradicate many of the diseases in liver that begin with a simple grade 1 fatty liver and end up with some cirrhosis or carcinoma.

CONCLUSION

Supportive care in patients diagnosed with HCC and intervention in early diagnosed cases with HCC and its preventive aspects might be a better option as far as our treatment modalities are concerned. The preventive and therapeutic applications and life style alteration in Ayurveda on cancer is incredible especially on considering the metabolic correction and hence its exploitation should be further promoted.

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