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# An Ayurvedic pragmatic approach to Non-alcoholic Steatohepatitis vis-à-vis *Yakritodara*

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## ABSTRACT

Liver is considered to be the key organ of the body as it is concerned with filtration, metabolism, detoxification and other vital functions. Non Alcoholic Steatohepatitis (NASH) represents a part of a wide spectrum of Non Alcoholic Fatty Liver Disease (NAFLD). NASH is typically associated with Obesity, Type II Diabetes, Dyslipidemia and the Metabolic Syndrome. Epidemiological studies suggest the prevalence of NAFLD is around 9% to 32% of general population in India with a higher prevalence in those with Obesity and Diabetes. It can be understood that the *Nidana* and *Samprapti* of *Yakritodara* is similar to the etiopathogenesis of Non-alcoholic Steatohepatitis (NASH). Ayurveda known for its safe and cost effective medication has a great potential in treating NASH. *Virechana* being the most suitable *Shodhana Karma* is indicated in liver disorders in *Bahu Doshavastha* and *Srotorodha*. Hence, it is the need of the hour to search an effective and safe Hepatoprotective ideal remedy from the Ayurvedic treasure of therapeutics for the welfare of mankind.

**Key words:** Non Alcoholic Steatohepatitis, *Yakritodara*, *Virechana*.

## INTRODUCTION

The liver is the most massive organ of the viscera occupying a substantial portion of the abdominal cavity. It is wedge shaped weighing about 1.2-1.5kg and is divided into largest right and much smaller left lobe. It is the only organ of the viscera that can regenerate. The liver is the key organ which regulates the homeostasis in the body responsible for the production and excretion of bile, metabolism of proteins, carbohydrates, lipids, storage of vitamins and detoxification of the toxic substances such as

alcohol, drugs etc. Due to the advanced technology and the busy schedule, the lifestyle of an individual has become sedentary along with lack of exercise and there is increased popularity of fast foods leading to the impairment of metabolism in an individual making him prone to a series of disorders called as 'lifestyle disorders' which has a direct impact on the liver and its functions.

Non Alcoholic Steatohepatitis (NASH) represents a part of a wide spectrum of Non Alcoholic Fatty Liver Disease (NAFLD) which ranges from simple Steatosis and Steatohepatitis to advanced Fibrosis and Cirrhosis.<sup>[1]</sup> The occurrence of Non Alcoholic Steatohepatitis in Type 2 Diabetics, Obese and Hypertriglyceridemics is exceedingly high. Also, the risk of severe liver disease goes up with the increasing features of 'Metabolic Syndrome'.<sup>[2]</sup> Global prevalence of NAFLD is estimated at 24% with highest rates in the Middle East and South America and lowest in Africa.<sup>[3]</sup> Epidemiological studies suggest the prevalence of NAFLD is around 9% to 32% of general population in India with a higher prevalence in those with Obesity and Diabetes.<sup>[4]</sup>

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Liver is compared with *Yakrit* mentioned in Ayurvedic classics. *Acharya Bhavamishra* was the first to introduce the term '*Yakrit Vikara*' with its classification in his treatise *Bhavaprakasha*.<sup>[5]</sup> There is no direct reference available in the Ayurvedic classics correlating to Non Alcoholic Steatohepatitis (NASH). Non Alcoholic Fatty Liver disease (NAFLD) is a *Santarpanajanya Vyadhi* and based on the *Nidana, Samprapti* and *Lakshanas*, we can correlate it with *Kaphaja Yakritodara*.<sup>[6]</sup>

Non Alcoholic Steatohepatitis (NASH) is a large, untapped market with no FDA (Food and Drug Administrative agency) approved therapeutics. In spite of the tremendous advances made in modern medicine, still there is a need of effective and safe Hepatoprotective medicines. Hence, it is the need of the hour to search an effective and safe Hepatoprotective ideal remedy from Ayurvedic treasure of therapeutics for the welfare of mankind.

#### Embryological origin and physiological perspective of *Yakrit*

During *Garbhavastha*, *Yakrit* is formed from *Rakta Dhatu* itself during the 3<sup>rd</sup> to 7<sup>th</sup> month.<sup>[7]</sup> *Acharya Bhavamishra* explained, *Yakrit* is situated on the right side below the *Hridaya*, it is formed from *Shonita* and is the seat of *Ranjaka Pitta*.<sup>[8]</sup> *Yakrit* is derived from the *Matruja bhava*<sup>[9]</sup> and is the *Mulasthan* of *Raktavaha srotas*.<sup>[10]</sup> *Samana Vayu* brings the *Aahara Rasa* into the *Hridaya* where it is converted into the *Rasa Dhatu* which when reaches the *Yakrit* and *Pleeha* gets converted into *Rakta Dhatu* due to the *Ushnata* of *Ranjaka pitta*.<sup>[11]</sup>

#### Etiopathogenesis : Modern and Ayurvedic Perspective

Heavy fat rich diet, junk foods, soft drinks sedentary lifestyle, Metabolic syndrome (Obesity, Diabetes Mellitus, Dyslipidemia, Hypertension), drugs like (eg: Corticosteroids, Aspirin, Tetracycline) etc. are considered to be the major etiological factors of Non Alcoholic Steatohepatitis.<sup>[12]</sup>

According to *Bhavaprakasha*, *Vidahi*, *Abhishyandi Ahara* like *Madhya*, *Kulatha*, *Masha*, *Mahisha Dadhi*

causes *Rakta* and *Kapha Dushti*<sup>[13]</sup> leading to the *Dushti* of *Rasavaha*, *Raktavaha*, *Medovaha*, *Annavaha* and *Pureeshavaha Srotas* and thereby producing "*Kaphaja Yakritodara*". *Ajirna* (Indigestion), *Sthoulya* (Obesity) and *Prameha* (Diabetes Mellitus) which also occur due to the *Dushti* of *Annavaha*, *Rasavaha* and *Medovaha Srotas* acts as *Nidanarthakara Rogas* (Diseases which cause another diseases) which may result in the manifestation of Non Alcoholic Steatohepatitis.

Several mechanisms have been postulated to explain the pathogenesis of Non Alcoholic Steatohepatitis. The currently favoured is 'Two Hit Hypothesis' which explains why not everyone with fatty liver disease develops hepatic fibrosis. The 'first hit' results in steatosis (fatty liver) which is only complicated by inflammation. If a 'second hit' occurs, Leptin, which is an appetite reducer and a fibrogenic in vitro, is probably then needed to cause hepatic fibrosis. The components of first hit includes the release of free fatty acids from central adipose tissue, along with adipokines, drain into the portal vein as well as causing insulin resistance. These processes result in reduced hepatic fatty acid oxidation and increased fatty acid synthesis.

Fatty liver occurs as a result of increased fat import into hepatocytes and reduced fat export. Insulin resistance causes hepatic steatosis, which also perpetuates insulin resistance. Subsequent activation of TNF-alpha, oxidant stress through the production of reactive oxygen species and production of endotoxins then result in inflammation and eventually fibrosis. Factors including leptin are probably needed for fibrosis.<sup>[14]</sup>

Similarly, according to Ayurvedic perspective, the *Vidahi-Abhishyandi Ahara* and *Vihara* leads to *Agnivikruti* and formation of *Apakva Anna Rasa* resulting in *Kapha Dushti* (*Bahu Drava Sleshma*) and impaired fatty acid metabolism. The improper formation and deposition of *Abaddha Medas* occurs in *Yakrit* leading to *Medovridhi*. This process results in Steatosis (fat deposition in liver). The *Kapha* and *Medo Dushti* causes *Srotorodha* that leads to *Vata*

*Prakopa* and causing *Agnidipti*. When *Pitta* gets involved in the *Samprapti*, hepatocytes have inflammatory changes and the disease progresses to the next level i.e. Non Alcoholic Steatohepatitis (Steatosis + Inflammation). The *Prakupita Vata* further causes *Dhatu Paaka* leading to Fibrosis and the condition may progress to its drastic end stages Cirrhosis, Ascites, Hepato cellular Carcinoma and also pave way to other metabolic complications.

### Lakshanas

*Agninasha* (Loss of appetite), *Avipaka* (Indigestion), *Arochaka* (Anorexia), *Udarashoola* (Dull aching abdominal pain in the right hypochondriac region), *Anaaha* (Abdominal bloating), *Chardi* (Vomiting), *Pandu* (Anemia), *Mrudu Jwara* (Fever), *Dourbalya* (Fatigue).<sup>[15]</sup>

### Samprapti Ghataka

- *Dosha* - *Tridosha* - *Samanavayu*, *Apanavayu*, *Pachakapitta*, *Ranjakapitta*, *Kledaka Kapha*
- *Dushya* - *Rasa*, *Rakta*, *Meda*
- *Agni* - *Jataragni*, *Dhatvagni*
- *Ama* - *Jataragni* and *Dhatwagnimandhyajanya Ama*
- *Srotas* - *Rasavaha*, *Raktavaha*, *Medovaha*, *Annavaha*, *Pureeshavaha*
- *Sanchara* - *Siras*
- *Srotodushti Prakara* - *Sanga*
- *Udbhava Sthana* - *Amashaya*
- *Vyakta Sthana* - *Udara*
- *Adhishtana* - *Yakrit*
- *Vyadhi Swabhava* - *Chirakari*
- *Rogamarga* - *Abhyantara*
- *Sadhyasadhyata* - *Krichrasadhyata*

### Chikitsa

There is no established treatment for Non Alcoholic Steatohepatitis (NASH) in conventional medical science. Initial approach involves dietary modifications based on Metabolic Profile (Obesity,

Diabetes, Hyperlipidemia, Hypertension) and getting patients to increased levels of physical activity. The stage of liver damage from healthy liver to Steatosis and Steatohepatitis is reversible. But, as the damage progresses further to Fibrosis and Cirrhosis, the condition becomes irreversible. Hence, steps should be taken to treat the disease at the initial stages and to stop it from progressing to the irreversible condition.

According to *Bhavaprakasha*, the *Hetu*, *Samprapti* and *Lakshanas* mentioned for *Pleehodara* are similar to that of *Yakritodara*. The only difference is that the *Sthana* of *Pleeha* is *Vaama Parshva* and that of *Yakrit* is *Dakshina Parshva*.<sup>[16]</sup>

The root cause of all the *Udara Rogas* is *Prakupita Vata Dosha* and *Mala Sanchaya*. Hence, *Vatanulomana* should be carried out repeatedly in all the *Udara Rogas*.<sup>[17]</sup> *Virechana* is the most suitable *Shodhana Karma* in liver disorders. It is the best remedy for *Pittaja* and *Raktaja Roga*<sup>[18]</sup> and is indicated in *BahuDoshavastha* and *Srotorodha*.

“*Natisnigdha Shariraay Dadhyat Sneha Virechanam |*

*Sneha Utkilshita Shariraay Ruksham Dadhyat Virechanam |*”<sup>[19]</sup>

As Non Alcoholic Steatohepatitis is a *Santarpanajanya Vyadhi*, *Ruksha Virechana* should be given. If *Snigdha Virechana* is given in *Atisnigdha* individuals, then due to the *Atisnigdhatata*, the *Doshas* will get adhered in the other *Srotas*. Hence, *Ruksha Virechana* is indicated. The management should be the breakdown of pathological factors like *Agnivaigunya*, *Srotorodha* and *Kaphamedodushti*. *Agnideepana*, *Rookshana*, *Srotoshodhana*, *Kapha*, *Meda* and *Vata Dushti Chikitsa*. When Fatty Liver progresses to next stage and *Dhatu* get involved, treatment should be directed towards *Prasadana* of *Rasa* and *Rakta* and also *Yakritshothahara Chikitsa*.

### Importance of Guda Ardraka Yoga in Yakritodara

*Charaka* has explained the importance of *Guda Aadraka Prayoga*. Intake of *Guda* (Jaggery) and *Aadraka* starts with  $\frac{1}{2}$  *Pala* (24 ml) *Pramana* on the first day and there after, by increasing  $\frac{1}{2}$  *Pala Matra*

per day upto a maximum of 5 *Pala Matra* (10<sup>th</sup> day). This *Matra* should be kept constant and continued for a period of another 20 days. It acts as *Kapha Shamaka*, *Deepana*, *Pachana*, *Shulahara*. This *Yoga* can also be indicated in *Avipaka*, *Kamala*, *Gulma*, *Arsha*, *Shotha*, *Prameha*, *Shwasa*, *Kasa* and *Pratishyaya*.<sup>[20]</sup>

#### Importance of *Gomutra Haritaki Prayoga* in *Yakritodara*<sup>[21]</sup>

*Gomutra* and *Haritaki* both possess *Kapha* and *Medoghna* properties due to the dominance of *Agni* and *Vayu Mahabhuta*. *Haritaki* has *Gunas* like *Kashaya*, *Ruksha*, *Ushna*, *Anulomana* and *Gomutra* possesses *Gunas* like *Katu*, *Tikshna*, *Ushna*, *Kshara*. *Gomutra* is *Kapha Shodhaka* and *Haritaki* is *Vatanulomaka*. Hence, *Gomutra Haritaki* acts as *Deepana*, *Kaphahara*, *Vatanulomaka*, *Srotoshodhaka*, *Shophahara* and there by, helps in the breakdown of the pathological factors (*Agnivaigunya*, *Srotorodha* and *Kaphamedodushti*) responsible for Non Alcoholic Steatohepatitis.

#### Important *Yogas*

The drugs which possess the properties like *Rechana*, *Vatashamaka*, *Agnivardhaka*; *Aama*, *Meda* and *Kapha Nashaka* are preferable in Non Alcoholic Steatohepatitis. Various formulations of *Churna*, *Vati*, *Kashaya*, *Asava-Arishta Kalpanas* and *Rasoushadhi's* are mentioned in classical texts which can widely be used for this purpose.

- ***Churna Yogas*** - *Narayana Churna*, *Pippali Churna*, *Neelinada Churna*, *Hapushadya Churna*, *Patoladi Churna*, *Mahasudarshana Churna*.
- ***Vati Kalpanas*** - *Chitrakadi Vati*, *Rohitakadi Vati*, *Agnitundi Vati*, *Arogyavardhini Vati*.
- ***Kashaya Kalpanas*** - *Vasaguduchyadi Kashaya*, *Patola katurohinyadi Kashaya*, *Patolamooladi Kashaya*, *Varanadi Kashaya*, *Phalatrikadi Kwatha*.
- ***Asava-Arishta Kalpanas*** - *Rohitakarishtha*, *Pippalyasava*, *Kumaryasava*, *Kalameghasava*.
- ***Rasoushadhis*** - *Yakrit-Plihari Loha*, *Icchabhedi Rasa*, *Pleehantaka Rasa*, *Lokanath Rasa*, *Plihari Rasa*.

All the above *Yogas* are well known for their hepatoprotective properties and can be effectively used in the management of Non Alcoholic Steatohepatitis.

#### CONCLUSION

Non Alcoholic Steatohepatitis (NASH) is the inflammation of liver and damage caused by the build up of fat in the liver. It can be understood that the etiopathogenesis of Non Alcoholic Steatohepatitis is similar to the *Nidana* and *Samprapti* of *Yakritodara* which is developed due to the vitiation of *Kapha* and *Pitta*. *Virechana* is the most suitable *Shodhana Karma* in liver disorders, being the best remedy for *Pittaja* and *Raktaja Roga's*. The stage of liver damage from healthy liver to Steatosis and Steatohepatitis is reversible. But, as the damage progresses further to Fibrosis and Cirrhosis, the condition becomes irreversible. So, steps should be taken to treat the disease at the initial stages and to stop it from progressing to the irreversible condition. Hence, it is the need of the hour to search an effective and safe Hepatoprotective ideal remedy from Ayurvedic treasure of therapeutics for the welfare of mankind.

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