



A CRITICAL REVIEW ON ETIO-PATHOGENESIS (NAIDANIKA SAMPRAPTI) OF NON-ALCOHOLIC STEATOHEPATITIS (YAKRIT ROGA)

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Abstract

Non alcoholic steato hepatitis(NASH) is the more severe form of Non Alcoholic Fatty Liver Disease(NAFLD) becoming not only cause for liver related mortality and morbidity but also responsible for increased susceptibility of atherosclerosis, cardiovascular disease and type 2 diabetes mellitus. In India the prevalence of NAFLD is 9 to 32% in general population and it found to be of higher prevalence in those with obesity or overweight and those with diabetes and prediabetes. Approximately 25% of NASH patients Over a period of 10 to 15 years may progress to cirrhosis. Currently FDA (Food and Drug Administrative Agency) approved pharmacologic treatment options for NASH are not available. The NASH can be correlated to Yakrit Roga in Ayurveda. No detailed description regarding the disease is available in classics. So here unique attempt has been made to understand the hetu (cause), samprapthi(pathogenesis) of NASH on the basis of risk factors associated with NAFLD/NASH like obesity, hyperlipidemia, type 2 diabetes mellitus and other metabolic syndrome. It can be considered that the nidana of Santarpanajanya Vyadhi, medho roga(atishoulya) and Prameha may be the nidana for NAFLD/NASH and samprapthi is build. Apatarpana chikitsa may be useful.

Keywords: NASH, NAFLD, Yakrit, Santarpana janya vyadhi, Medoroga, Prameha, Yakritroga

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INTRODUCTION

Non alcoholic fatty liver disease has been explained as the buildup of fat in the liver in the absence of recent or ongoing intake of significant amount of alcohol. Non alcoholic steato hepatitis is the more severe form of NAFLD becoming not only cause for liver related mortality and morbidity but also responsible for increased susceptibility of atherosclerosis, cardiovascular disease and type 2 diabetes mellitus. A non- alcoholic patient is defined as either total abstainer or with alcohol intake of less than 20g/day (approximately 30ml of whisky=100ml of wine=240ml of Beer=10g of alcohol)^[1]. NASH is strongly associated with histological findings of liver inflammation, cellular ballooning, focal necrosis and fibrosis^[2].

Global prevalence of NAFLD is as high as 1 billion as per current estimation^[3]. In India the prevalence of NAFLD is 9 to 32% in general population and it found to be of higher prevalence in those with obesity or overweight and those with diabetes and prediabetes^[4]. The prevalence of NAFLD is 59.67% in type 2 DM⁵.

Approximately 25% of NASH patients Over a period of 10 to 15 years may progress to cirrhosis. Up to 70% of cryptogenic cirrhosis have NASH is the underlying cause⁶. In the name of Urbanization the changes made in our

life style, fat rich diet and higher inherited tendency for diabetes mellitus makes the Indian population to more prone for metabolic syndrome or insulin resistance and its manifestation such as NAFLD and NASH^[7].

NASH is emerging as the second leading cause for liver transplantation^[8]. The current annual medical and societal costs of NAFLD are estimated at \$292 billion in the United States. The projected cost of caring for patients is expected to increase by 18% from 2000 to 2035 and health related quality of life of NAFLD patients is described as declining^[9].

Currently, treatment options for NASH are limited. Despite the significant burden to the public health system, there are no current FDA (Food and Drug Administrative Agency) approved pharmacologic treatment options for NASH. In the initial stage of NAFLD it is reversible. Thus there is a need for effective treatment that manages the complex pathophysiologic process of NASH and protect the liver from further consequences.

The NASH can be correlated to *Yakrit Roga* in Ayurveda. No detailed description regarding the disease is available in classics. So here unique attempt has been made to understand the *hetu* (cause), *samprapthi*(pathogenesis) of NASH on the basis of risk factors associated with NAFLD/NASH like obesity, hyperlipidemia, type 2 diabetes mellitus and other metabolic syndrome. It can be considered that the *nidana* of *Santarpanajanya*

Vyadhi, medho roga(atishoulya) and *Prameha* may be the *nidana* for NAFLD/NASH and *samprapthi* is build. *Apatarpana chikitsa* may be useful.

Description of Yakrit:

According to *Sharangadhara Samhita* *yakrit* is the seat of *ranjaka pitta*^[10] and also seat for *rakta dhatu* “*Agni reva shareere pittantar gata kupitakupita shuba ashubani karoti ca.*”^[11]

According to above reference *agni* and *pitta* are one and the same. Both *Sushruta* and *Vagbhata* have also stated that the main venue of *rakta*(blood)is *yakrit*(liver) and *pliha*(spleen)^[12]. The term *sthana* (place) may mean a storage depot or place of production or both. *Yakrit* and *pliha* is stated as *moola* for *raktavaha srotas*.

The *jataragni* residing in *amashaya* held responsible for *sanghata bheda* (complex to simpler form), *bhutagni* present in *yakrit* is held responsible for the conversion of respective *bhautika* form of *aahararasa* by respective *bhutagni*^[13]. The above concept is well supported by contemporary science that liver is responsible for metabolism of carbohydrate, protein, fat.

Nidana(cause)

The knowledge of *Hetu*(cause), *Linga*(symptoms) and *Oushada*(medicine) stands first for deciding Health and Disease condition called as *Trisutra*^[14]. NASH can't be compared directly with single disease entity in *Ayurveda* so here attempt has been made to

understand the *nidaana, samprapthi* of NASH by considering the prevalence and risk factors of the NASH like obesity, hyperlipidemia, type 2 diabetes mellitus and other metabolic syndrome. It can be considered that the *nidana* of *Santarpanajanya Vyadhi, medho roga(atishoulya)* and *Prameha* may be the *nidana* for NAFLD/NASH.

Santarpanajanya vyadhi nidana:

The diseases which manifest because of *ati samporna*(over nourishment) are called as *santarpanajanya vyadhi*. Excessive intake of *atisnigdha*(unctuous), *atimadhura*(sweet), *atiguru*(heavy), *atipichila aahara*(sticky), *navaanna*(newly harvested rice), *navamadhya* (new vine), *anupamamsa sevana* (flesh of animals of marshy inhabitants) other products like milk, curd etc, *guda* (jaggary) and its derivatives for long duration^[15].

Prameha *nidana*:

Aasya sukha(comfortably sitting for long duration), *swapna sukha*(sleeping for long duration) , *dadhi* (curd)*sevana guda*(jaggary) and its derivatives, *navannapana*(newly harvested rice) , *ksheeranna sevana* ,*avyayama*(lack of physical exercise) these are the *nidana* for *prameha*^[16].

Atishoulya nidana:

Guru(heavy),*madhura*(sweet),*sheeta*(cold),*sni gdha*(unctuous),*avyayama*(lack of physical exercise),*divaswapna*(day sleep),*amaituna*(lack of intercourse),*harsha*

nitya(always happy),*achinta*(no worries),*beejaswabha* (heredity) these are the *nidanas* of *atisthoulya* ^[17].

Samprapthi:

Samprapthi it is the path taken by *dosha* and *dushya* for the genesis of disease. Most of the above said *aaharas* are *guru*, *snigdha*, *madhura*, *picchila*, *manda*, *sheeta guna yukta* and having *prutvi* ,*jala mahabhuta* predominance and may leads to *dravyata* and *gunata vruddi* of *kapha dosha* and *viharas* will leads to *karmata vruddi* of *kapha* and *agnimandyata* because *agni*(*pitta*) and *kapha* are having mutually opposite *gunas*. This *prakupita kapha dosha* may cause *dravyata vruddi* of *medho dhatu* in the body because *kapha* and *medho dhatu* ^[18] share similar *panchaboutika* composition that is *prutvi* and *jala mahabhuta* ^[19]. *Ashrayashraya bhava sambhanda* may be considered here ^[20]. Here formed *medho dhatu* is not *prakruta* it is called *abadha medho dhatu*.

The *aahara rasa* carries the *abadha medhodhatu* which is *abhishtayandi*(obstructing), *Pichila*(sticky) and *guru guna*(heavy) *yukta* starts circulating in the body. Because of *pichila*, *manda*(stagnating,slow moving) *guna* etc may leads to *srotorodha*(obstruction) in *dhamanias* may leads to atherosclerosis, *kapha dusta rakta* may be presented with hyperlipidemia etc. Here formed *abaddha*

medhodhatu will starts circulate in *rakta* as it reaches to *yakrut* starts getting accumulated in the *Yakrut* as liver plays central role in fat metabolism ^[21] upto 5% weight of liver accumulation of fat in the cells of liver will be normal more than 5% is considered as hepatocellular steatosis ^[22]. As the fat gets infiltrated into hepatocytes it causes obstruction. Further the functions of the *yakrit* is hampered. So *pitta* and *vata* gets obstructed in *Yakrut* itself can't flow out so further leads to *paka* (inflammation) of *Yakrut* ,the obstructed *Pitta* and *Vata* dosha causes *shoshana* in *yakrut* so soft liver cells which are derived from *matruja bhava* are replaced by hard fibrotic cells presenting with non alcoholic steatohepatitis. This non alcoholic steatohepatitis better to call as metabolic steatohepatitis.

Samprapthi ghatakas

1. *Dosha: kapha(kledaka) pitta(pachaka and ranjaka),vata(samana vata,vyanavata, apanavata)*
2. *Dushya : Rasa Rakta Medodhatu.*
3. *Agni: Jataragni and Dhatvagni*
4. *Amaa: Jataragni mandhya ,Dhatvagnimandya janya ama*
5. *Srotas: Rasavaha Raktavaha Medovaha Srotas*
6. *Srotodusti prakara: Sanga*
7. *Udbhava sthana: Amashaya*
8. *Sanchara sthana: Rasayani*

9. *Vyakta sthana: Yakrit*

11. *Sadhyasdhya:*

Kashtasadhya

10. *Vyadhi swabhava: Chirakari*

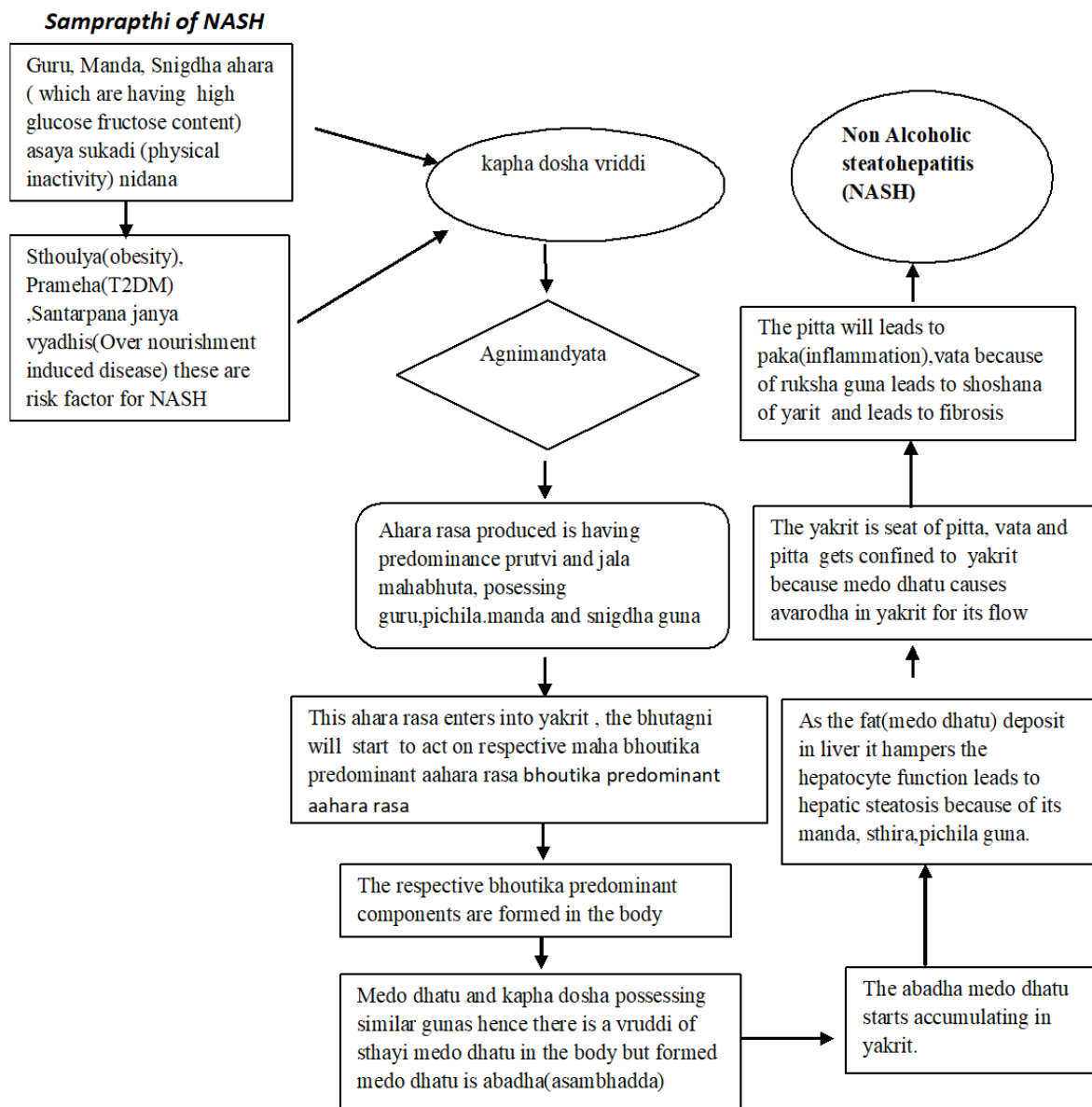


Figure showing the etio-pathogenesis of NASH

Symptoms of NASH

Most of the time the NASH is asymptomatic and incidentally detected with elevated transaminase (AST/ALT) or GGT, or fatty liver changes in ultra sonography^[23]. These

abnormalities some time detected while doing evaluation for dyspepsia, malaise, prior to medical procedure like organ donation or routine health checkups. Few patients may complain of pain in right upper quadrant and fatigue^[24].

Direct comparison of clinical features of NASH is not available so *mlana (sluggish) yakrit lakshana* of *Madava Nidana* can be considered here they are Shakrit apravritti (obstructed stool), pittalpata (reduced bile secretion), atitrushna (excessive thirst), avilamutrata (dense urine), kardama dehasya (body with dirt/waste materials), paandutva (pallor), admana (distension of abdomen), avasada (tiredness) vamana (vomiting), agnimandyata (reduced digestion capacity), tiktamukhata (bitter taste in mouth), maladyata in jiwha (coating on tongue), udgara (belching), Katina naadi (feeble pulse) [25].

Chikitsa:

According to chikitsa siddanta Santarpanajanya vyadi are treated with apatarpana chikitsa. Langhana, Rukshana and Swedana chikitsa are elaborated under apatarpana chikitsa [26]. As in case of NASH

bahudoshavasta is present *Shodana* is necessary as it also relieves the *srotoavarodha*.

Langana "yat kinchit lagavakare dehe tat langhanam" that which induces lightness in the body is called as *langhana*.

Among four *samshuddi* procedure of *langhana*, *virecana* can be selected here as yakrit is affected which is the seat of *pitta* and *moola* for *rakatavaha srotas* it will also eliminate not only *dushita pitta* but *dushita*

kapha is also eliminated out of the body. *Ruksha virecana* may be helpful here because already more *snigdhatva* is available in the body. *Rukshana chikitsa* is indicated in *abhishyandi*, *mahadosha avasta*, *marmasthanagata vyadhi*, *urusthamba roga* [27]. *Niragni swedana* may be helpful in NASH because it is *sthamba* and *gourava nigraha*.

Tikta rasa pradana dravya may be more helpful here as they will do *shoshana* which is very much essential here in present condition.

Discussion:

NASH cases are gradually increasing in nature because of its strong association with T2DM, Obesity, Hyperlipidemia, metabolic disorders so there is a need of strong reversible treatment at initial stage of NAFLD.

Sampkepat kriya yogo nidana parivarjana

First and foremost avoiding the cause of disease is important in treating the any disease so here *nidana parivarjana* is mandatory. Avoiding *Asya sukha*, *swapna sukha*, *madhura snigdha guru pichilla ahara* in excess in high risk peoples. *Vyayama* according to the strength of the body.

In contemporary science also non pharmacological treatment comprises of life style interventions to promote weight loss and also improve the insulin sensitivity through diet changes and physical exercise. Currently licensed pharmacological agents for NASH are

not available. Treatment is directed towards coexisting metabolic disorders^[28].

Samprapthi vighatana eva chikitsa |

All the *nidanas* having predominance *guru, manda, snigha and pichila guna madhura rasa* so there is need of using the *oushada* and *aahara* possessing the *gunas* like *laghu, ushna, teekshna, vishada, ruksha, sukshma, khara, sara, and khatina gunas* and also *katu, tikta, kashaya rasa pradana and ushna veerya*. These may help in relieving *srotorodha* and also act on *kapha medha*. *Pittasarana dravya* may also help here as there is *srotorodha*. *Anulomana dravya* may also help as *yakrit* is said to be related with *pureeshadara kala* so *anulomana* do eliminates *pakva* and *apakva mala*.

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