

UNDERSTANDING THE CONCEPT OF CHOLELITHIASIS AS PER AYURVEDIC TEXT-- A REVIEW

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ABSTRACT

Gallstones are formed from the constituents of the bile (viz. cholesterol, bile pigments and calcium salts) along with other organic components. They are formed in the gallbladder, but sometimes may develop within extra hepatic biliary passages, and rarely in the larger intrahepatic bile duct. Gallstone disease caused by cholesterol is a frequent clinical illness impacted by hereditary factors, advancing age, female gender, and metabolic factors. The details of 'Cholelithiasis' is not mentioned in *Ayurvedic* classics directly, but the term *Pittashaya ashmari* can be coined for it, as *Vagbhata* while explaining the *Samprapti* of *ashmari* says that *Ashmari* is formed in *Basti* as *Rochana* is formed in *Pittashaya* of cow. So the *Ashmari* formed in *Pittashaya* of humans, similar to *Gorachana* can be considered as *Pittashaya ashmari*. *Sushruta* explained *Pittashaya* as one of the *Sapta Ashayas* in *Shareerastana* which actively participate in digestion. Gallstones happens when excess *Kapha dosha* combines with the *Pitta* characteristics of the viscous fluid bile, causing it to become dry and hardened. Based on the involvement of *doshas chikitsa* can be given according to the *yukti*. This always causes symptoms such as "Alasya" or lethargy, "Gaurava" or abdominal heaviness, and "Mandagni". After analysing the *Ayurvedic* texts, it was found that due to the similarity in location and function, the bile secreted from the gall bladder can be correlated with the *Accha Pitta* described in *Ayurveda*. Owing to the irregular shape of *Kapha* during the course of digestion and its vitiation owing to *Vata* and *Pitta*, the pathogenesis of gall stone disease takes place.

KEYWORDS: Cholelithiasis, Gallbladder, Pittashaya and Pittashaya ashmari.

INTRODUCTION

Gall stones are one of numerous disorders that can develop in the gallbladder (cholelithiasis). Cholelithiasis (gallstone development) is influenced by a mixture of causes, including excess cholesterol saturation of bile, rapid nucleation of cholesterol monohydrate in bile, and bile stasis or delayed gallbladder emptying due to decreased gallbladder motility. Among India, it is more frequent in women in the north, north-east, and east as compared to other zones in the country.

There are two types of gallstones, among them approximately 80 percent of gallstones contain cholesterol and the remaining 20 percent are pigment stones, which consist mainly of calcium bilirubinate. Cholesterol-containing gallstones are divided into two subtypes: cholesterol stones (which contain 90 to 100 percent cholesterol) and mixed stones (which contain 50 to 90 percent cholesterol).^[1]

Gall Stone ailment is not directly mentioned in *Ayurvedic* texts. In *Ayurveda*, the term *Ashmari* is only

mentioned in the context of *Bastigata Ashmari* (urinary calculi). Due to the similarities in location and function, it was discovered that bile released by the gallbladder can be connected with *Accha Pitta* described in *Ayurveda* after examining the *Ayurvedic* literature. The pathophysiology of the disease arises as a result of improper *Kapha* production during digestion and subsequent vitiation as a result of *Vata*.^[2]

In *Ayurveda*, clinical manifestations explained in *Pittaja udarashoola*, *yakritodara*, *shakhashrita kamala* represent different hepato-biliary diseases including cholecystitis, but there lies hardly any direct reference of a disease which can be correlated to Cholelithiasis. The term *Pittashaya ashmari* can be coined for it as *Vagbhata* while explaining the *Samprapti* of *mootrashmari* says that *ashmari* is formed in *basti* *Rochana* in *Pittashaya* of cow. Hence the *ashmari* (stones) formed in *Pittashaya* of humans resembling the (*go*)*rochana* can be considered as *Pittashaya ashmari*.

Presence of stones in gallbladder, either symptomatic or asymptomatic may lead to acute or chronic cholecystitis and presence of stones in other parts of biliary tract can cause obstruction in bile ducts leading to ascending cholangitis or pancreatitis. Any of these conditions can be life threatening and are considered to be surgical emergencies requiring cholecystectomy.

Ayurvedic concept of Pittashmari

Pittashaya Ashmari has not been mentioned in both *Vedic* and *Samhita Kalas*. Rather than that, a scattered indirect references can be seen which can be correlated. Establishment of *pittashaya* in *Ayurveda* is a challenging task where two different concepts has been used. Some of the glimpse in ancient texts are as follows. According to *Sushruta*, there are *Sapta Ashayas* in which *Pittashaya* is one among them. According to *Sharangadhara Samhita*, instead of *pittashaya* he has mentioned *agnyashaya* which is inside the *pakwashaya*.^[3] The exact location of *pittashaya* is quiet controversial. According to *Astanga sangraha* while describing the *garbhasaya* mentions that it is situated between *pittasaya* and *pakwashaya*. So from the above references the location of gallbladder can be taken as *pittashaya*. Synonyms for *pittashaya* are *pittakosha*, *kloma*, *tila*.

Sushruta has mentioned that *kloma* is situated below *kalakhanda* on the right side and it is popularly known as *tilaka*. According to *Adhamala kloma* is situated near the *yakrit* and it is known as *tila*. According to *Kasyapa Samhita*, *kloma* is present right to the *hrudaya*.^[4]

The *Accha pitta* generated in the second stage of digestion bears striking similarity with bile which is stored in gallbladder. Hence gallbladder can be named as *pittashaya*. From the above points, we can conclude the fact presented above that the notion of *pittashaya* is already laid in *Ayurveda* but it is labelled morphologically with *yakrit*. So *kloma*, *tilaka* may be considered as gallbladder. *Kloma* would be considered along with the *yakrit* that might be the probable reason that's why it has not been mentioned separately.^[5]

None of the authors of *Ayurveda* mentioned *Pittashaya Ashmari* on human being but the word *Gorochana* (gall-stone of cow) is formed in bile inside the gallbladder of the cattle. It is said that *Ashmari* is formed when *Go pitta* (bile of cow) dries up by *Vayu* and forms *Gorochana* (gall stone of cow).

According to *Sushruta*, *Peetavabhasata* as one of the symptom of *Pitta sanchaya*. Here it indicates the yellowishness of body. Hence can be considered as a bile on the basis of similarity in location, function, and abnormality. This *Accha pitta* is generated from liver and stored in gallbladder. So that it is clear that Gallbladder stores *pitta* (Bile), hence the organ can be considered as *pittashaya* and stone formed can be considered as *Pittashaya Ashmari*.^[6]

Acharya Sushruta while discussing about the *Samprapti* of *kukshi shoola* due to the *nidanans* like *atibhojanath*, *aayasa*, *viruddhanna upasevanath* and *ajeerna* the *vata dosha* gets aggravated vitiates *agni* leading to *ama* formation. The person breaths with difficulty, and troubled greatly with pain and does not find comfort in any position. So when you compare it with the pain in right upper quadrant of abdomen this *kukshi shoola* can be considered because of its symptom. *Acharya Sushruta* has not mentioned it as a major form of disease.^[7]

Cholelithiasis (gall stones) are crystalline concretion formed within the gall bladder by accretion of bile components. The clinical presentations are pain in right upper quadrant of abdomen, flatulent dyspepsia, nausea.

Gallstones found more in Females, Forty, Fertile and Fatty people.

This signifies commonly that there should be a pathology involving impaired Cholesterol metabolism for manifestation of Gallstones. So, the *Nidanans* which help to alter the cholesterol metabolism (*kaphakara nidana*) or favour the hemolysis leading to increased bilirubin production (*Pittakara nidana*) can be considered in *Ayurveda*.^[8]

No specific *nidana* has been mentioned in case of *Pittashaya ashmari*. So a try has been made to attempt with *doshas* related.

Due to various *nidana sevana*, especially *kaphakara ahara*, *vihara*, there will be *agnimandya* causing *ama* or *kapha vriddhi* (Hyper secretion of cholesterol in bile/impairing bile acid and cholesterol ratio) and *Vatakarmahani* (Hypomotility of gallbladder causing stasis and impaired function of cholecystokinin --*samana vata vikriti*) which in turn causes formation of *ashmari* in *pittashaya*. Adding to this *Charaka* while explaining *Shakhashrita kamala*, says *Kamala* is produced due to obstruction of *Shleshma* (*Ruddhabaddha kamala*) which can be correlated with obstructive jaundice manifested especially due to Gallstone obstructing CBD. Hence *pittashaya ashmari* can be considered as *Poorva roopa avastha* of *Shakashrita kamala* when it is co related with Obstructive jaundice.^[9]

Causes of gall stone formation^[5]

- High caloric and high fat diet
- Obesity - normal bile acid pool and secretion but increased biliary secretion of cholesterol.
- Weight loss - prolonged fasting causes gall stone formation. Mobilization of tissue cholesterol leads to increased biliary cholesterol secretion while enterohepatic circulation of bile acids is decreased.
- Female sex hormones – a. Estrogen stimulates hepatic lipoprotein receptors, increased uptake of dietary cholesterol and increased biliary cholesterol secretion. b. Natural estrogens, other estrogens and oral contraceptives lead to decreased bile salt

secretion and decreased conversion of cholesterol to cholesterol esters.

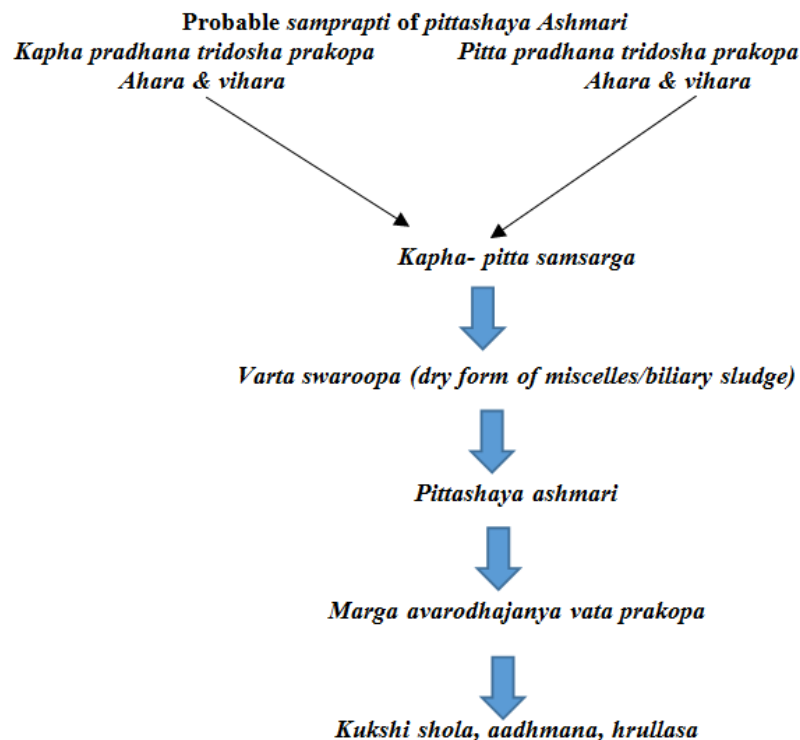
- Increasing age – increased biliary secretion of cholesterol, decreased size of bile acid pool, decreased secretion of bile salt.
- Gallbladder hypo motility leading to stasis and formation of sludge, which is due to a. Prolonged parenteral nutrition b. Fasting c. Pregnancy d. Drug such as Otreotide

- Drug induced - Increased biliary secretion of cholesterol due to Clofibrate therapy.
- Genetic factors - as per modern science genetic factors accounted for 25%.

Signs and Symptoms of cholelithiasis

- Pain in right upper quadrant of abdomen
- Flatulent dyspepsia
- Nausea/ Vomitting

Probable *Samprapti* as per Ayurveda



While considering the pathogenesis of gall stone on Ayurvedic perspective, it can be said that the *kapha prakopaka Nidana sevana* (causative factors) leads to accumulation of *Kapha* at first, which produces the symptoms like *Alasya* (lethargy), *Gaurava* (heaviness), *Mandoshmata* (decreased digestive fire). In *Pittashaya* (gall bladder) quantitatively accumulated *Kapha* mixes with the *Pitta* already present in it. The mixture of *Kapha* and *Pitta* in *Pittashaya* leads to the formation of viscous material (biliary sludge) causing obstruction in the passage of *Vayu*. Hence the *Vayu* gets vitiated by its *Rukshadi gunas* and converts the viscous material into dry and solid form called as *Pittashaya ashmari* (gall stone).

Pathogenesis

Factors associated with gall stone formation are impaired gall bladder function, Cholesterol nucleating factors, Super saturated bile, Absorption / Entero hepatic circulation of bile acids.

Clinical manifestation

Two thirds of Gall stones are asymptomatic. The most common presenting symptom is pain in right upper quadrant of abdomen, pain might radiate to the back, and to the inferior angle of scapula. Nausea, with or without vomiting, flatulent dyspepsia might be present. Certain foods, especially those with high fat content, can provoke symptoms.

Mechanism of gall stone formation

According to modern science there are 3 stages of gall stone formation which can be explained from Ayurvedic point of view as below.

Bile Super Saturation with cholesterol (*Vikrita Kaphasanchiti*) The most important factor in gall stone formation is increased biliary secretion of cholesterol. This may occur in association with

- Obesity
- High caloric and cholesterol rich diets
- Increased hepatic uptake of cholesterol from blood.^[6]

Nucleation of cholesterol monohydrate with subsequent crystal retention and stone growth (*Kaphapitta samsarga*). While super saturation of bile with cholesterol is an important prerequisite for gall stone formation, it is generally not sufficient by itself to produce cholesterol precipitation in vivo. Most people with super saturated bile do not develop stones because the time required for cholesterol crystals to nucleate and grow is longer than the time bile spends in the gall bladder.^[7]

As per *kala samprapti* mentioned in *Ayurvedic* texts, a prolonged and abnormal second stage of digestion (*Dwitiya Avasthapaka*)^[15] accelerate the nucleation of cholesterol monohydrate crystal due to which bile spends more time in gall bladder allowing the *Ama Kapha* to concentrate, supersaturate and nucleate leading to the cholesterol crystal formation.^[8]

In human lithogenic Bile, the nucleation of cholesterol monohydrate crystals is greatly accelerated. This acceleration of cholesterol monohydrate in bile may be due to deficiency of anti-nucleating factors.^[9]

As mentioned earlier, as there is a formation of *Ama kapha* in the first stage of digestion, subsequently the second stage is also affected in which the pitta produced is unable to perform its normal functions as it comes direct in contact with *Ama kapha*. This phenomenon is somewhat similar to the deficiency of anti-nucleating factors and accelerated nucleation of cholesterol monohydrate crystal.

Abnormal gall bladder motor function with delayed emptying and stasis (*Margavarodhajanya Vataprakopa*)

A third important mechanism in cholesterol gall stone formation is gall bladder hypo motility. The stone will not be able to grow, if the gall bladder empties all super saturated or crystal containing bile. A high percentage of patients with gall stones exhibit abnormalities of gall bladder emptying. It correlates with *Vataprakopa*.^[10]

At the end of second mechanism *Pittasansargita Kapha* which is in abnormal consistency is similar to biliary sludge. This sludge becomes obstacle in the passage of *vayu* leads it's provocation. When *Vayu* gets vitiated and provoked, it produces the symptoms like *Sramsas*, *Vyasa*, *Vyadha*, *Sanga* etc.^[11] In the present context of gall stone the term *Sramsas* can be taken as functional lethargy of gall bladder whereas *Vyasa* can be considered as dilatation of gall bladder leading to increased gall bladder volume. *Vyadha* and *Sanga* can be correlated with pain and obstruction causing improper emptying of gall bladder respectively. All these lead to increase in the residual volume.

As pathogenesis goes on, because of increased residual volume, *Vayu* gets provoked due to the obstruction in its passage. Hence the *Ruksha*, *Khara*, *Vishada* and *Laghu*

Gunas of vitiated *Vayu* convert the sludge into *Varta swarupa* (dry form) called as gall stone.^[12]

DISCUSSION

Pittashaya ashmari, as described in *Ayurveda*, refers to cholelithiasis, which affects people of all ages and is the most prevalent gastrointestinal illness. There is *vikriti* of *pitta* or *rakta* byproduct in *Pittashaya ashmari*, and *Ashmari* denotes stone/calculus. The calculi in the gallbladder of cow may have some link to the gallbladder of humans and its symptomatology according to *Acharyas*. Gallstones are documented in ancient and current literature, despite the fact that cholelithiasis has a complex aetiology with no unifying explanation concerning nucleating agents. *Acharyas* categorised *Pittashaya ashmari* as *vataja*, *pittaja*, and *kaphaja* based on its composition and characteristics, which are comparable to *Mutrashmari's doshika* status.

CONCLUSION

- Cholelithiasis (Gall stones) refers to crystalline concretions of bile components formed within the gall bladder.
- The incidence gradually increases after 21 years and it reaches the peak in the 5th & 6th decades.
- The most important factor in gall stone formation is super saturation of bile with cholesterol which can be correlated with *Vikrita Kaphasanchiti* in *Pittashaya* as per *Ayurveda*. The phenomenon of deficiency of anti-nucleating factors and accelerated nucleation of cholesterol monohydrate crystal is somewhat similar to *Kapha-pitta Samsarga*. The third mechanism i.e. gall bladder hypomotility can be correlated with *Margavarodhajanya Vataprakopa*.
- Cholelithiasis even though exclusively tackled with surgical assistance possess different problems post operatively in terms of metabolic disturbances. Hence an *Ayurvedic* principle of management which mainly targets on metabolic correction is to be applied for better patient compliance.
- So there is definite scope for *Ayurveda* in the area of non-surgical management of Cholelithiasis.

REFERENCES

1. Alan R. Gaby et al, Nutritional approaches to prevention and treatment of Gallstones, *Alternative medicine review*, 2009; 14(3): 258.
2. The Concept of Cholelithiasis as Per *Ayurvedic Text*, Londhe P D, *International Journal of Ayurvedic Medicine*, 2016; 7(1): 6-9. ISSN: 0976-5921.
3. Acharaya Yadavaji Trivikramji. *Charaka Samhita of Charaka with Ayurvedadeepika commentary of Chakrapanidutta*. Chikitsa sthana verse 25-26. Varanasi: Choukambha Surabharathi Prakashan; Edition, 2010; 435.

4. Acharya Yadavji Trivikamji. Sushruta Sahmita of Sushruta with Nibandhasangraha commentary of Dalhanacharya and Nyayachandrika Panjika of Gayadasacharya on Nidana Sthana. Varanasi: Choukambha Orientalia; Reprint, 2019; 303.
5. Kasper DL, Braunwald E, Fauci AS, Hauser SL, Longo DL, Jameson JL, Loscalzo J. (2008). Harrison's principles of internal medicine (17th ed.). New York: McGraw-Hill Medical Publishing Division, 1993.
6. Ravidatta Tripathi, Charakasamhita with Vidyamanorama Hindi commentary, Chaukhamba Sanskrit Pratishthan, delhi, Sutrasthana, 2009; 118/44-46: 281.
7. Kasper DL, Braunwald E, Fauci AS, Hauser SL, Longo DL, Jameson JL, Loscalzo J. Harrison's principles of internal medicine (17th ed.). New York: McGraw-Hill Medical Publishing Division. 2008; 1991.
8. Ravidatta Tripathi, Charakasamhita with Vidyamanorama Hindi commentary, Chaukhamba Sanskrit Pratishthan, delhi, Chikitsasthana, 2009; 16/131: 412.
9. Anantram Sharma, Sushruta Samhita with Sushrutavimarshini Hindi commentary, Chaukhamba Surabharati Prakashan, Varanasi, Sutrasthana, 2009; 21/18: 183.
10. Kasper DL, Braunwald E, Fauci AS, Hauser SL, Longo DL, Jameson JL, Loscalzo J. Harrison's principles of internal medicine (17th ed.). New York: Mc, 2008.
11. Ravidatta Tripathi, Charakasamhita with Vidyamanorama Hindi commentary, Chaukhamba Sanskrit Pratishthan, delhi. Chikitsasthana, 2009; 15/9: 359.
12. Ravidatta Tripathi, Charakasamhita with Vidyamanorama Hindi commentary, Chaukhamba Sanskrit Pratishthan, delhi, Chikitsasthana, 2009; 15/36: 366.