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Original Research Paper

Ayurveda

UNDERSTANDING CHOLELITHIASIS AS PER AYURVEDIC TEXT

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ABSTRACT Ayurveda has been the philosophy of creation. At that time, maximum populations are free of disease, but health will decline over time and the manifestation of diseases will increase. In their Ayurvedic text, different authors explained clinical results and disease management.. Cholelithiasis (gallstone formation) forms a combination of multiple factors, including super saturation of bile with cholesterol, accelerated nucleation of cholesterol monohydrate in bile, and bile stasis or delayed gallbladder emptying due to impaired gallbladder function. A charyas had some idea about the calculi in the gallbladder of cow which may have some relation to gallbladder and its symptomatology in human. The word Ashmari in Ayurveda stands for stone which is described only in the context of Bastigat Ashmari (urinary calculi). 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. The article deals with the explanation from the Ayurvedic perspective of the creation of gall stone.

KEYWORDS : Cholelithiasis, Gall bladder, Kloma, Pittashaya and Pittashaya ashmari,

INTRODUCTION:

There are several diseases which arise in gall bladder and one among them is gall stones. The prevalence of gall stone disease is more common in the western society. In India it is more common in women in north, north-east and east as compared to other zones in the country. In children the gall bladder stone found in approximately 5%, between 30 - 69years of age the prevalence is up to 10% in male and 19% in females and increase in 70 - 80 year old people to 30 - 40%.¹

The word Ashmari in Ayurveda stands for stone which is described only in the context of Bastigat Ashmari (urinary calculi).²None 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).³

Anatomical consideration being formation of gall stones:

Bile is produce by liver & stored in gall bladder ,Gall stones are formed in gall bladder.

Acharya Sushruta explained Pittashaya as one of the Sapta Ashayas⁴:-

(Vatashaya,Pttashaya,Saleshmashaya,Raktashaya,Aamash aya,Pakkvashaya and mutrashaya.) Gall bladder stores Pitta *i.e. bile*, hence stone formed in it can be considered as *Pittashaya ashmari*. Hence the present study was undertaken with the aim to understand the concept of *Pittashaya ashmari* as per Ayurveda.

The position of *Pittashya* is not clearly mention in Ayurvedic text but classical Ayurvedic literature have got many references which probably indicates that gallbladder can be taken as "*Kloma*" in Ayurvedic classical text. The position of "*Kloma*" in Ayurvedic text may be correlated by different author.

- According to *Dalhana Kloma* as *Tila* like structure situated in the right side of the abdomen below the liver that can be consider as gallbladder.⁵
- In commentary of Sharangdhar samhita, Aachaya Adhmal described the Anatomical and Physiological concept of kloma. According to him "Kloma" is situated

near the liver and it is full of waste product of blood (Bile). He has also mentioned *Kloma* is *Tila* like structure.

- Sharangdhar described that "Kloma" develops from the waste product of blood". $^{\rm 6}$
- Kashyap also described the position of Kloma which is just below the liver while describing various Kosthtang in Sharir Sthan of his Samhita.⁷
- According to Ashtanga Samgrah liver and Kloma have been described in right side, below to liver which also suggests the nomenclature of gallbladder.⁸

Thus we can conclude the facts presented above that the concept of *Pittashaya* is already laid in Ayurveda but morphologically it is described along with the liver. However, *Kloma* may be taken as gall bladder. In Ayurvedic Samhita gall bladder i.e. *Kloma* would have been considered along with the liver that is why no separate description is available. A better appreciation of the concept obtained by referring the liver spleen diseases i.e. "Yakrit pleeha roga". Particularly Shakhashrita Kamala may be correlated with extra hepatic biliary diseases, where some obstruction in the biliary tract has been considered as the primary cause of disease. Again no description of *Ashmari* and other diseases pertaining to *Pittashaya* is available in the classical text.

Cholelithiasis(*Pittashaya ashmari*) is a commonest surgical problem in India as well as world. In Vedic & Samhita period clinical manifestations of *Pittajudar Shool Sanipatodar*, *Yakrittdalyodar* and *Shakhasrita kamala* are somewhat similar to the Chronic Cholecystitis and Cholelithiasis.

Nidana OF PITTASHAYA ASHMARI :-

The formation of the Ashmari in pittashaya corresponds to the formation of gorochana in cattle mentioned above. The *Pittashaya ashmari nidanas* can be considered according to doshik niadana.

The following Doshika Nidanas for Pittashaya Ashmari can be considered in Ayurveda.

• Kaphakara nidana:[°]

Avyayama, Diwaswapna, Snigdha, Madhura, Picchila, Guru Ahara Sevana, Dadhi, Ghrita, Mamsa, Pishta, Tila Vikriti Sevana, Abhishyandi Ahara Sevana, Adhyashana, Samashana.

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Pittakara Nidana:¹⁰

Upavasa, Katu, Amla, Lavana Ahara Sevana, Tila Sevana.

• Pandu and Kamala Roga Nidana:¹¹

Kshara, Amla, Lavana, Ushna Ahara, Tila tail sevana, Kama, Krodha,Bhay,Shock.

According to Moderen science:-

- Causes of gall stone formation :¹²
- 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.

According to ayurveda	According to Moderen science			
 Madhura, Picchila, Guru Ahara Sevana, 	• High caloric and high fat diet			
Ghrita, Mamsa, Snigdha • Avyayama,	• Obesity - normal bile acid pool and secretion but increased biliary secretion of			
• Upavasa Katu, Amla, Lavana Ahara Sevana	 cholesterol.) Weight loss - prolonged fasting causes gall stone formation.(Mobilization of tissue cholesterol leads to 			
• Tila Vikriti Sevana(one study found that the consumption of sesame seed powder	increased biliary cholesterol secretion while enterohepatic circulation of bile acids is decreased			
 sesame seed powder may affect estrogen levels in postmenopausal women. This not only increases estrogen activity but also omproved blood cholestrole).¹³ Shoka Upavasa Coitus 	 Female sex hormones Estrogen stimulates hepatic lipoprotein receptors, increased uptake of dietary cholesterol and increased biliary cholesterol secretion. Natural estrogens, other estrogens and oral contraceptives lead to decreased bile salt secretion and decreased conversion of cholesterol to cholesterol esters. Gallbladder hypo motility leading to stasis and formation of sludge, which is due to: Prolonged parenteral nutrition b. Fasting Pregnancy 			

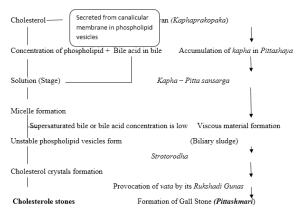
Probable Samprapti as per Ayurveda:

According to Ayurvedic view, the probable pathogenesis of gall stone, it can be said that kaphaprakopaka Nidanasevan with pittakarak nidana sevan (causative factors) initially leads to Kapha accumulation, and then produces symptoms such as Alasya (lethargy), Gaurav (heaviness), Mandoshmata (decreased digestive fire).

The Kapha and Pitta mix together which already present 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 Pittashmari (gall stone).

Probable Samprapti of Pittashmari:-According to Modern scince¹⁴ According to Ayurveda

According to Modern scince¹⁴ According to Ayurveda



Ashmari vis via Pittashaya Ashmari and its reason:

Dalhana while commenting on the Samprapti of Ashmari, explained that person who does not undergo purification regularly and who indulge in unhealthy foods and activities, Kapha gets aggravated and united with urine and forms Ashmari²⁴.Dalhana makes a comment that Ashmari will be Na Eka Desha that means Ashmari will not be present in only one place where ever it forms it is called as Ashmari only. In this context instead of combining with urine it gets combine with Pitta with the help of Vata it forms Ashmari in Pittashaya. So this can be considered as Pittashaya Ashmari.

Acharya Sushruta explains Ashmari will start forming from the childhood itself and gave the reason also²⁵. Likewise we can correlated with the same for *Pittashaya i.e.Alpa Mukha*, Anupachith Mamsa. Color of the *Pittashaya Ashamri* can be compared with *Pittaja Ashmari* in which *Sa Rakta* Peetavabhasa krushna^a has been said²⁶ Where the colour of the cholesterol stones will be yellowish whereas pigmented stone will be in blackish in colour.

BILE IN AYURVEDIC TEXT:-

The Physical characteristics and qualities of *Pitta* described in the ancient Ayurvedic texts striking resemblance to hepatic bile. The pigments of bile i.e. the bilirubin and biliverdin are the constituents of hemoglobin. While in Ayurvedic references *Pitta* as the *Vikriti* or by product of *Rakta* (i.e. blood is equally significant as above). Bile is generally thought to be the modern analogue or representative of *Pitta*. It will be appreciated from the physiological description of *Pitta*, though there is much similarity between the two, yet *Pitta* is much wider term in Ayurveda.

Accha pitta :

The Accha Pitta produced in the second stage of digestion bears striking similarity with bile which is stored in gall bladder. Hence the gall bladder can be named as 'Pittashaya'. The daily secretion of hepatic bile is around 500 – 600 ml.¹⁵ which promotes digestion and absorption of dietary fat, emulsification of fat soluble vitamins to enable their absorption, acts as bactericides'. According to Ayurveda, all these functions are similar to *Pachan Karma* of *Accha Pitta*. The two enzymes produced from bile viz. stercobilin and urobilin gives the normal colour to the faeces and urine respectively. According to ayurveda the function is nothing but the *Ranjan Karma* of *Pitta* i.e. to give the *Prakrit Varna* to *Purisha* and *Mutra*.¹⁶

Acharya Sushruta has mentioned 'Pitavabhasata' as one of the symptom of Pittasanchaya (abnormal accumulation of Pitta).¹⁷ Pitavabhasata indicates the yellowish appearance of the body which according to modern science is due to the obstructon of biliary tract and increased seceration of bile.

Hence the Achha Pitta can be considered as bile on the basis of similarity in location, functions and abnormality. Achha Pitta i.e. bile is produced form liver and stored in gall bladder; hence the gall bladder is considered as Pittashaya.

Classification of types of Pittashmari²⁷:

Type of Ashmari	Varna/ Colour		Akriti/ Structure Like	Sadrista/ Resemblence with
Kaphaj	Sweta	Snigdha	Mahan kukkut-anda	Madhuk pushpa varna
Pittaj	Pittavbhasa	Smooth	Bhallatakasthi	Madhu varna
Vataj	Syava	Kathina	Visam, khara, like kantak	Kadamba pushpa

Classification of types of Gallstones²⁷-

Type of Stone	Colour	Surface	Structure	Size	Number	Component
Cholest erol	Yellow- white	Shiny	Round	Big	Single	Cholesterol
Mixed	Brown	Faceted	Round	Small	-	Cholesterol, pigment
Pigmen t	Black	Dull, spiky	Irregular	Small	Many	Ca bilirubinates , Pigment polymer

Probable gall stone formation according to Ayurveda:

According to ayurveda all the disease is produced by Shatkriyakala. According to modern science there are 3 stages of gall stone formation which can be explained from Ayurvedic point of view as below:

1ST Stage:

Cholesterol saturated in gall bladder with the bile and its pigments (Vikrita Kaphasanchiti).

In the human body all the process of metabolism and catabolism doing regularly due to the concept of Agni. Jatharagni Is the prime agni which cause proper digestion of food and its function can be correlated with chemical processes involved in gastrointestinal diagestion. In Ayurvedic view, the digestion of food materials in the gastric and intestine, such as Aamashya and Pachyamanashaya. The most essential and special digestion site in duodenum. When the chyme is reached in duodenum, it is responsible for stimulating the digestive juice-hepatic and pancreatic juice seceration. which necessary for the diagestion of food materials This correlation would become an assumption of concern produced by the digestion phase of Charaka as Awasthapaka.¹⁸

 The food becomes Madhura, which triggers the relaxation and development of Kapha, according to Awasthapak, the first stage of digestion. Ultimately, if a person has Agnimandh and consumes more Kaphaprakopak Ahara, then in the first stage the development of *kapha* is more quantity and abnormal consistency, which can be regarded as *Aam Kapha* (abnormal Kapha). This *Aam Kapha*, developed in *Awasthapak*, mixes with the *Ahararasa* and circulates throughout the body with the aid of *Vyana Vayu*.¹⁹

 Because of the existence of Aam Kapha in it, created for illness, such Ahararasa creates obstacle (sanga) in the Srotasas. This Aam kapha gets trapped (chaya) in it if there is Khavaigunya in Pittashaya. One of the symptoms of Kaphasanchaya (assembly of Kapha) has been stated by Acharya Sushruta as 'Mandoshmata'²⁰. The Mandoshmata suggests that at both stages, i.e., decreased digestive function Dhatwagni and Jatharagni. Therefore, it suggests the poor metabolism of fat in the biliary system due to which there is saturation of cholesterolin gall bladder.

2nd Stage:

- Cholesterol nucleation with consequent retention of crystals and growth of stones (Kaphapitta sansarga).
- Super cholesterol bile saturation is an important condition for the development of gall stone, most people with super saturated bile do not develop stones because the time required for nucleating and developing cholesterol crystals is longer than the time bile spends in the gall bladder.²¹ The normal cholesterol and bile acid ratio is 25:1. But when this ratio falls to 13:1 the cholesterol pecipitate and thus gall stone forms.

According to *kalasamprapti*²²mentioned in Ayurvedic text, if the first stage is prolonged than the second stage diagestion is abnormal (*Dwitiya Avasthapaka*) accelerate the nucleation of cholesterol monohydrate crystal because the bile is staying in gall bladder more time allowing the *Aam Kapha* to concentrate, super saturate and leading to the cholesterol crystal formation.

In human lithogenic Bile, The cholesterol monohydrate crystals nucleation is greatly accelerated. If the antinucleating factors are deficient in bile than acceleration of cholestrole monohydrate is more. As mentioned earlier, as there is a formation of *Aam kapha* in the first stage of digestion, subsequently the second stage is also affected so the *Pitta* produced, which is unable to perform its normal function and it comes under the direct contect with *Aam Kapha*. This phenomenon of *kapha pitta sansarga* is similar to the deficiency of anti nucleating factors, and accelerated of Cholesterol monohydrate crystal.

3rd Stage:

- Abnormal gall bladder function with delayed emptying and stasis (Margavarodhajanya Vataprakopa).
- Third most important mechanism in gall stone formation is hypo motility of gall bladder. The stone not able to grow, if the gall bladder empties all crystal containing bile and cholesterol crystals. The hypomotility of gall bladder is due to the Vataprakopa.
- At the end of the second stage Pittasansargita Kapha which is abnormal consistency similar to biliary sludge. This Pittasansargita Kapha become obstacle in the passage of vayu, leads its provocation. Vayu gets vitiated and provocated and produced the Symptoms like Sransa, Vyasa, Vyadha, Sanga etc.²³
- The term Sransa can be taken as functional lethargy of gall bladder, Vyasa can be correlates with 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.
- According to above pathogenesis when the gall bladder residual volume is increased, *Vayu* gets provoked due to

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the obstruction in its passage.so Ruksha, Khara, Vishad and Laghu Gunas of vitiated Vayu convert the sludge into Varta swarup (dry form) called as gall stone.

CONCLUSION:

In the Ayurveda description, we may conclude that the Gall bladder is Kloma. On the basis of similarity in position, feature and abnormality, the Accha Pitta can be regarded as bile. This Accha Pitta is made from the liver and stored in the gall bladder, so the Pittashaya is considered to be the gall bladder. Bile super saturation with cholesterol, which can be associated with Vikrit Kaphasanchiti in Pittashaya as per Ayurveda, is the most significant factor in gall stone formation. The cholesterol monohydrate crystal phenomenon of deficiency of anti-nucleating factors and accelerated nucleation is very similar to Kaphapitta Samsarga. Margavarodhajanya Vataprakopa can be associated with the third mechanism, i.e., gall bladder hypo motility.

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