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Review Article

ASSOCIATION OF VITAMIN B12 DEFICIENCY WITH *JEERNA AMLAPITTA* AND ITS AYURVEDIC MANAGEMENT

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ABSTRACT

Vitamin B12 deficiency is a growing concern in today's era, as it can lead to fatigue, neurological problems, and increased risk of chronic diseases if left untreated. It is required for the development, myelination, and function of the central nervous system, healthy RBC formation, and DNA synthesis. Vit B12 deficiency is silent health crisis in India, affecting approximately 51% of the general population. *Amlapitta,* a condition characterized by hyperacidity and digestive issues in Ayurveda, contribute to Vitamin B12 deficiency due to impaired nutrient absorption. In *Jeerna Amlapitta* impaired digestion disrupts the conversion of *Ahara Rasa* to *Rasa Dhatu,* compromising nutrient formation and distribution**.** The pathogenesis and symptoms of the *Amlapitta* are directly governed by the imbalance of *Samana Vayu, Kledaka Kapha, Pachaka Pitta* and delayed gastric emptying. Slow motility allows food to ferment and acidify (*Vidagdha*) increasing *Pitta* and provoking *Vata*. As *Rasa Dhatu* plays a crucial role in nourishing the body, deficiencies in essential nutrients like Vitamin B12 can arise. Therefore, treating *Amlapitta* is vital for enhancing the absorption and metabolism of Vitamin B12, highlighting the importance of digestive health in maintaining optimal nutrition. Ayurveda offers effective management strategies for *Amlapitta*, which can, in turn, help alleviate Vitamin B12 deficiency by enhancing digestive health and nutrient absorption.

INTRODUCTION

Vitamin B12 deficiency is a common nutritional disorder which occurs due to inadequate intake, impaired absorption, or chronic gastrointestinal disturbances. Vitamin B12 is required for the development, myelination, and function of the central nervous system; healthy red blood cell formation; and DNA synthesis. [1,2,3]

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The average daily requirement for vitamin B12 is about 2.4µg for adults, which is easily met through animal products like meat, eggs, and dairy. The liver stores 2 to 5 mg of B12, which can last anywhere from 3 to 5 years. Thus, a deficiency takes years to manifest if intake stops. [4] Vit B12 deficiency is silent health crisis in India, affecting approximately 51% of the general population.[5] Long-standing digestive disorders can interfere with the normal absorption of Vitamin B12 in the stomach and ileum, leading to symptoms such as weakness, fatigue, giddiness, numbness, loss of appetite, and anaemia.[6] From an Ayurvedic perspective, this condition can be understood as a result of *Agnimandya, Ama* formation, and *Rasadhatu Dushti* leading to generalized weakness and deficient nourishment.

In Ayurveda, *Jeerna Amlapitta* can be correlated with chronic hyperacidity and long-standing impairment of *Agni.* Due to continuous vitiation of *Pachaka Pitta, Kledaka Kapha*, and *Samana Vayu,* there is improper digestion and assimilation of nutrients. *Mandagni* and chronic irritation of the gastrointestinal tract gradually affect the absorption of essential nutrients, including Vitamin B12.

Classical Vedic texts do not mention *Amlapitta* specifically, but in the Samhita period, *Acharya Kashyapa* was the first to identify it as a distinct condition, providing detailed explanations and treatment approaches.[7]

Amlapitta is a term composed of two Sanskrit words: *Amla* and *Pitta*. *"Amla"* refers to a sour taste, known to stimulate increased salivary secretion.

"Pitta" signifies a vital biological entity responsible for digestion, metabolism, and transformation within the body. When *Pitta* becomes *Vidagdha* due to improper dietary and lifestyle changes, it leads to the formation of *Amlapitta.*

AIM AND OBJECTIVE

1) Association of B12 deficiency with *Jeerna Amlapitta.*
2) Its effective management in Ayurveda.

MATERIAL AND METHODS

The core concepts and foundational knowledge were sourced from Ayurvedic classical texts including research papers, and journal articles about *Amlapitta* and B12 absorption.

***Nidaan* of *Amalapitta* [8,9]**

Amlapitta is caused due to vitiation of *Pitta dosha* associated with *Agnimandya*. Continuous indulgence in improper *Ahara* and *Vihara* leads to *Vidagdha Pitta* and manifestation of *Amlapitta*.

Category	Causes	Examples
1. *Aharaja*	• *Adhyasana* and *Ajeerna*	*Nindit Vyadhikaranaam*
	• *Fanita* (fermented foods)	Bread, bakery products, alcohol
	• *Kulatha*	*Amlapitta Jananaam*
	• *Usha Tikshna Vidahi anna*	Vitiated the *Drava* and *Amla guna* of *Pitta*
	• *Paryushita Anna*	Refrigerated and frozen foods, leftover meals.
	• *Viruddha Ahara*	Milk shake, cold drinks and junk food.
	• *Snigdha guru Ruksha anna*	Vitiation of *Agni*
2. *Viharaja*	• *Vegdharana* • *Divaswapana*	*Jatharagni Mandata*
	• Excessive physical work leading to *Dhatu Kshaya.* • *Ratrijagarana*	*Pitta and Vata Prakopa*
3. *Mansika*	• *Atichinta, Bhaya, Irshaya-dwesh*	➢ Directly plays a role in A*ma* formation. ➢ Impact overall well being.
4. *Anya*	• Excessive intake of alcohol, smoking, tobacco.	➢ Stomach mucosal lining gets irritated leading to impaired gastric acid secretion. ➢ *Kledaka Kapha Dushti*
	• Living in *Anoop desha*	
	• *Sharad Ritu*	*Pitta Prakopaka Ritu*
	• Long term use of NSAIDS and PPI [10,11]	

***Lakshana* of *Amlapitta* [12]**

According to *Acharya Madhava*, the symptoms of *Amlapitta* include:

Avipaka (impaired digestion), *Kanthadaha* (burning sensation in the throat), *Klama* (fatigue), *Tikta Amla Udgara* (bitter, sour regurgitation), *Gaurava* (heaviness in the body), *Aruchi* (loss of appetite), *Utklesha* (nausea), *Hritdaha* (burning sensation in the chest)

Types

1) *Urdhvaga* & *Adhoga*
2) *Vatanubandhi, Kaphanubandhi, Vatkaphanubandhi*.

***Samprapti* of *Amlapitta* [13]**

In *Amlapitta, Nidana Sevana* causes *Agnimandya* leading to vitiation of *Pachaka Pitta,* aggravation of *Kledaka Kapha*, and dysfunction of *Samaan Vayu*. Vitiated *Pachaka Pitta* causes excessive *Amla Bhava* and improper digestion, while aggravated *Kledaka Kapha* produces heaviness and obstruction in the *Amashaya*. Disturbed *Samaan Vayu* impairs gastric motility and digestion, resulting in delayed gastric emptying and formation of *Vidagdha Ahara.* These pathological changes manifest as *Amlodgara, Hritkantha Daha*, *Avipaka, Chhardi,* and *Gaurava.*

Vitamin B12 Metabolism [14]

Ingestion

↓

Vitamin B12 is consumed through food

↓

Stomach

• Gastric enzymes release B12 from food
•B12 binds to R protein
• Parietal cells secrete intrinsic factor (IF)

↓

Gastric Emptying → Duodenum

↓

• Pancreatic enzymes degrade R protein
• B12 is released and binds to intrinsic factor

↓

Ileum (Terminal Small Intestine)

↓

• B12–IF complex binds to specific receptors
• B12 is absorbed into enterocytes

↓

Transport in Blood

• Inside enterocytes, B12 binds to transcobalamin II
• B12–Transcobalamin II complex enters plasma
• Transported to liver and other tissues

***Amlapitta* Association with Vitamin B12 Deficiency**

- **Role of *Pachaka Pitta*-** Chronic vitiation of *Pachaka Pitta* alters the normal gastric environment and impairs proper digestion and transformation of *Ahara,* thereby reducing the availability and absorption of Vitamin B12.
- **Role of *Kledaka Kapha*-** Aggravation of *Kledaka Kapha* causes prolonged retention of food in the *Amashaya* and disturbs gastric secretory functions, indirectly hampering the release and absorption of Vitamin B12.
- **Role of *Samana Vayu*-** Dysfunction of *Samana Vayu* delays gastric emptying and impairs the coordination of digestive and absorptive mechanisms necessary for proper Vitamin B12 uptake.
- **Role of *Agnimandya*-** Persistent *Agnimandya* in *Jeerna Amlapitta* leads to incomplete digestion, malabsorption, and nutritional deficiencies, among which Vitamin B12 deficiency becomes clinically significant. Long-standing *Amlapitta* with persistent *Agnimandya* may produce nutritional deficiencies due to malabsorption, among which Vitamin B12 deficiency can be clinically significant.
- From a modern perspective, chronic gastric dysfunction and altered acid balance in *Amlapitta* may impair intrinsic factor-mediated absorption of Vitamin B12.
- Vitamin B12 insufficiency may be linked to PPIs, although there is still a lot of debate regarding how to monitor this relationship in recent years. Long-term usage of PPIs may raise the risk of vitamin B12 insufficiency because of vitamin B12 malabsorption and bacterial overgrowth in the digestive tract. [15]

Comparative Flowchart in *Amlapitta* with special reference to Vitamin B12 Deficiency

Ayurvedic perspective	Modern corelation
Nidana sevana (Amla, Lavana, Katu, Adhyasana) ↓ *Jatharagnimandya* ↓ *Dushti* of *Pachaka Pitta* ↓ Aggravation of *Kledaka Kapha* ↓ Dysfunction of *Samaan Vayu* ↓ *Vidagdha Ahara* formation ↓ Delayed movement of *Ahara in* Amashaya ↓ *Amla Bhava* and *Utklesha* ↓ *Amlapitta Lakshana* ↓ *Amlodgara* *Avipaka*	Dietary irritation and gastric mucosal dysfunction ↓ Impaired gastric digestive function ↓ Altered gastric acid regulation ↓ Excess mucus, heaviness, gastric stasis ↓ Impaired gastric motility ↓ Incomplete digestion and fermentation ↓ Delayed gastric emptying ↓ Acid reflux, bloating, nausea ↓ Dyspeptic symptoms ↓ Sour belching, indigestion heartburn, post-prandial heaviness ↓

Hritkantha Daha, Gaurava ↓ Chronic *Agni Dushti* ↓ *Grahni dushti* and impaired absorption ↓ Defective *Dhatu Poshana* ↓ *Rasadhatu Kshaya* ↓ *Panduta, Daurbalya*	Chronic gastric dysfunction ↓ Damage to gastric parietal cells which produces intrinsic factor which is required to absorb vit B12 in small intestines ↓ Malabsorption ↓ Nutritional deficiency ↓ Vitamin B12 deficiency, fatigue, weakness

Treatment of *Amlapitta* with Respect to Vitamin B12 Deficiency

In *Jeerna Amlapitta* there is chronic impairment in the normal functioning of *Pachaka Pitta, Samaana Vayu, Kleda Kapha* and *Jathargani* which leads to defective digestion and poor absorption of nutrients including vit B12. Therefore, the ayurvedic management of vit B12 deficiency due to *Jeerna Amlapitta* should include the following principles-

1) *Nidaan Parivarjana*

Nidana Parivarjana involves avoiding the dietary and lifestyle factors that aggravate *Doshas* and contribute to disease. *Viruddha Ahara, Adhyasana*, excessive tea, coffee, stress, suppression of natural urges should be avoided.

2) *Agni Deepana* and *Amapachana*

Weak *Jatharagni* forms *Ama* which causes *Srotorodha* and leads to malabsorption and *Dhatu Kshaya.* So, if digestion remains weak, giving supplements may not fully correct the deficiency of vitamin B12 because there will be defective *Ahara Rasa* formation and absorption remains compromised. *Ama Pachana* helps clear metabolic obstruction and improve gut functional integrity and *Agni Deepana* restores digestive and absorptive capacity. Together they improve the *Jatharagni* and *Grahni's* function and there will be better bioavailability of nutrients and *Dhatu* nourishment.

Examples- *Shunthi, Yavani, Ajmoda, Chitraka, Musta, Hingvastak Churna, Dhanyaka, Jeeraka.*

3) *Pachaka Pitta Samayata* (Gastric mucosal health and gastric acid secretion)

In *Jeerna Amlapitta,* the aim of Ayurvedic management is not complete suppression of gastric acid secretion but normalization of *Pachaka Pitta* and *Agni*. Vit B12 absorption depends upon the healthy gastric mucosa, intrinsic factor secretion, proper ileal absorption.[16] Drugs and formulation like *Shatavari, Amalaki, Mulethi. Guduchi, Avipattikara Churna, Kaamdudha Rasa* will combat this condition.

Gastric acid secretion can be managed with the help of *Tikta Rasa pradhana dravyas* as *Tikta Rasa* is composed of *Aakash* and *Vayu Mahabhuta* possessing properties like *Deepana, Pachana, Pittashamna* and *Amahara.*[17] So *Tikta Rasa* regulates *Pachaka Pitta*, reduces *Vidagdha Pitta*, improves *Agni* thus inducing mucosal protective action.

Examples- *Guduchi, Nimba, Patola, Bhunimba.*

4) *Vataanulomaka Chikitsa* (increased gastric emptying)

In *Jeerna Amlapitta Samaan Vayu Dushti* leads to delayed gastric emptying, altered gastric secretions and defective absorption of nutrients. *Vata-Anulomaka Chikitsa* thus restores the normal direction and movement of *Vata* reducing symptoms like *Adhmana, Avipaka, Utklesha*. In modern aspect also improvement in gastric emptying helps in prolonged food retention thus reducing acid fermentation enhancing intestinal delivery and absorption. [18]

Examples- *Haritaki, Avipattikara Churna, Takra Prayoga, Mridu Virechana*

5) Management of Malabsorption

In modern physiology, vit b12 is absorbed from the terminal ileum after binding with intrinsic factor. From Ayurvedic perspective, this absorptive mechanism in terminal ileum can be corelated with healthy *Grahni* and healthy *Pittadhara Kala.*

When *Grahni* becomes weak due to *Jeerna Amlapitta*, it leads to defective nutrients assimilation, disturbed *Sara-Kitta Vibhajana* and decrease in micronutrients uptake.[19] After absorption, vitamin B12 is stored and metabolically processed in liver. In Ayurveda, liver functions can be corelated with *Ranjaka Pitta* and *Yakrit* function in *Rasa-Rakta* metabolism. If *Agni* and *Pitta* remain chronically disturbed nutrients transformation becomes defective and *Rasa* to *Rakta* conversion is impaired leading to *Panduta* and *Daurbalya* which is similar to symptoms found in vitamin B12 deficiency. Treatment here includes *Chikitsa* to improve *Grahni* to improve the absorption of vitamin B12 from terminal ileum and *Pitta Shamana* to restore healthy *Pachaka* and *Ranjaka Pitta.*

6) *Vamana*

Vamana helps by expelling the accumulated *Doshas,* reducing *Kapha-Pitta* or *Sama Pitta*

aggravation, clearing *Amashaya* thus improving *Agni* and *Grahni* function. [20] Thus, it may help in conditions where vitamin B12 deficiency is secondary to chronic gastrointestinal dysfunction.

7) *Virechana*

Virechana helps in eliminating vitiated *Pachaka Pitta* from the body and helps in restoring normal digestive balance. *Jeerna Amlapitta* also leads to *Grahni Dushti* leading to malabsorption. So *Virechana* also helps in clearing *Srotoavarodha* and improves intestinal function which supports nutrients absorption from the ileum.

8) *Basti* [21]

The mesenteric plexus acts as gut's second brain regulating peristalsis, local immunity and GIT secretions. In *Jeerna Amlapitta* the mesenteric plexus is in a state of hyperactivity. Serotonin acts as a chemical messenger that stimulates the muscles of the GI tract. Gut serotonin relays information directly to the central nervous system via the Vagus nerve, communicating feelings of fullness or signalling distress in the form of nausea or cramps. Because gut motility is compromised without adequate serotonin, digestion slows down. This can cause a breakdown in gut health, reducing the mucosal absorption of micronutrients, including Vitamin B12 itself. Chronic stress and *Ama* create sustained sympathetic tone which weakens the mucosal barrier and disrupts gastric emptying. It also triggers uncontrolled motility causing GERD. In Ayurveda *Basti* is described as *Ardha Chikitsa* and because of its profound action it plays an important role when chronic digestive function is associated with *Vata* predominance, *Grahni Dushti* and *Dhatu Kshaya*. Here *Basti* helps in regulating *Samaan Vayu, Apana Vayu* modulation of gut brain axis via parasympathetic activation.

Vitamin B12 deficiency causes *Daurbalya, Panduta*, neurological symptoms, so *Shodhana Basti* followed by *Brimhana Basti* can be considered for management which nourishes *Rasa Rakta* and *Majja Dhatu* and supports systemic strength and recovery.

Certain *Basti* such as *Ksheer Basti* and *Yapana Basti* have *Snigdha, Brimhana* and mucosal supportive properties which may help in maintaining intestinal integrity and favourable gut microbial balance**.**

9) *Rasayana, Balya and Brimhana Chikitsa*

Using *Rasayana* after proper *Deepana* and *Ama Pachana* can improve *Dhatvagni* which is responsible for converting food into plasma *(Rasa)* and *Rakta* (RBC).

Vitamin B12 deficiency manifests physically and neurologically as fatigue, muscles weakness, tingling, numbness (peripheral neuropathy) due to demyelination. *Balya* therapies restore the physical and neurological strength with the help of nervine tonics such as *Ashwagandha* and *Brahmi* which possess neuroprotective properties. They promote axonal regeneration, support myelin sheath repair and calm the hyperactive nervous system *(Vata Shamana).*[22] *Balya* Dravya also restores mitochondrial function and oxygen carrying capacity in blood, quickly relieving the physical exertion symptom associated with vit b12 deficiency. Ghrita preparations such as *Shatavari Ghrita, Dadhim Ghrita*, Brahmi Ghrita or *Ashwagandha Ghrita* can easily cross the blood brain barrier providing essential fatty acids to rebuild the myelin sheaths.[23]

10) Use of *Medhya Dravya*

Chronic stress and anxiety (*Bhaya, Chinta)* hyperactivate the sympathetic nervous system, and body enters sustained fight or flight mode. This diverts blood flow away from the gut, causing *Agnimandya. Medhya Dravya* fixes the hyperactivity of HPA axis lowering cortisol and adrenaline.[24] The restored vagal signal directly stimulates the stomach's parietal cells to secrete HCL and intrinsic factors. This directly resolves *Agnimandya* and provides favourable condition to cleave and bind dietary vitamin B12. By targeting the *Manas* and *Annavaha Srotas* at the same time, *Medhya Dravya* fixes the neuro-gastroenterological loop that drives stress induced nutritional deficiencies.

Example- *Shankhpushpi, Brahmi, Yasthimadhu, Guduchi*

11) *Shirodhara*

Vitamin B12 deficiency causing neurological manifestations can be corelated with *Vata Prakopa, Majja Dhatu Kshaya* and *Dhatu Alpata* due to *Agnimandya* and malabsorption. *Shirodhara* acts as a *Vata Shamaka* by stabilizing *Manovaha Srotas*. By promoting relaxation, it indirectly improves digestive coordination, *Agni* status and gastrointestinal function.[25] Though it doesn't directly increase vitamin B12 levels, it supports nervous system balance and digestive health.

Example- *Ksheerbala Taila, Brahmi Taila*

12) Yoga and Pranayama for *Jeerna Amlapitta* (gut health) [26]

Managing *Jeerna Amlapitta* requires restoring *Agni* and pacifying aggravated *Pachaka pitta*. Some *Asana* which are helpful in improving digestion, enhances gastric emptying and supports *Vata-Anulomana* are- *Vajrasana, Pavanamuktasana, Shashankasana, Bhujangasana.*

Some useful pranayama which reduces *Pitta* aggravated symptoms are *Sheetali* and *Sheetkari Pranayama* which reduces symptoms like burning sensation and gives mental relaxation. *Bhramari Pranayama* is helpful in stress induced gastric symptoms.

13)*Pathya-apathya* [27]

Pathya ahara (Beneficial diet)- *Puranshali, Mudga, Harenuk* are beneficial for *Amlapitta. Goghrit, Godugdha, Jangala Mansa* are also suitable for *Amlapitta. Kalaya Shaka, Pautik, Vasa Pushp, Vastuka* are good choices for *Amlapitta.*

Apathya Ahara (Harmful diet)- *Til, Urad, Kulthi* should be avoided in *Amlapitta. Aavi Dugdha, Dhanyamla* are not suitable for *Amlapitta. Lavana, Amla, Katu Rasa dravya* should be avoided in *Amlapitta. Guru Anna, Dadhi, Madya* are not recommended for *Amlapitta.*

DISCUSSION

In *Amlapitta, Amla rasa Vruddhi* with *Drava Guna Vruddhi* leads to *Kledaka Kapha Dushti.* This can cause delayed gastric emptying preventing degradation of R-protein and release of B12 in duodenum.

Saman Vayu Dushti in *Amlapitta* cause *Agnimandya* and increase acidity *(Shuktatva)* of *Pitta* causing degradation of R- protein and intrinsic factor in stomach.

Rasdhatu Dushti during *Amla Avasthapa* causes impaired B12 absorption.

Treatment protocol

- *Deepana* and *Pachana* for *Sama Pitta* and *Agnimandya.*
- As *Jeerna Avastha* is there, we have to work on *Saman Vayu* to regulate acid secretion.
- Also, a balanced *Kledaka Kapha* ensures proper absorption of B12.
- *Tikta Rasatmaka* drugs reduce *Shuktatva* of *Pitta.*
- *Deepana* and *Pachana Dravya* like *Lavana* and *Ksharaa kalpa* reduce this acidity.
- In *Tridoshaja* condition S*uvarnakalpa* can be used.
- For *Vata* and *Pitta* associated conditions, *Ghrita* can be the best option that can regulate gastric secretions as *Ghrutam pitta anilharam.*
- *Anulomana* for gastric emptying that can help B12 absorption

CONCLUSION

Hence, proper evaluation of *Amlapitta avastha*, accordingly selection of treatment with proper choice of *Panchakarma* will definitely regulate acid secretion and thus absorption of B12.

So, it is found that with use of *Panchakarma* and internal medicines *Jeerna Amlapitta* and recurrent B12 deficiency without takin any extra supplements but with proper diet can be treated. For this further study should be done with adequate clinical data.

However, in cases of severe vitamin B12 deficiency, supplementation with vitamin B12 is necessary to rapidly correct the deficiency and prevent neurological and hematological complications.

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