INTERNATIONAL JOURNAL OF AYURVEDA360

ISSN
PRINT:
3048-7382
ONLINE:
3048-7390

AYURVEDA 360

PEER-REVIEWED BIMONTHLY JOURNAL

2025
VOLUME 2
ISSUE 1
JULY-
AUGUST

www.ayurveda360.in/journal

REVIEW ARTICLE

CELIAC DISEASE

INTERNATIONAL JOURNAL OF AYURVEDA360

E-ISSN : 3048-7390
PRINT ISSN : 3048-7382
VOLUME 2 ISSUE 1 JULY-AUGUST 2025

Publisher

www.ayurveda360.in

DOI: 10.63247/3048-7390.vol.2.issue1.5

Integrating Ayurveda in the Management of Celiac Disease: A Comprehensive Review

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ABSTRACT

Introduction:

Celiac disease (CD) is an autoimmune condition triggered by the ingestion of gluten, resulting in inflammation and damage to the small intestine in genetically predisposed individuals. Ayurveda, an ancient holistic system of medicine, offers an integrative approach to managing CD. In India, the prevalence of CD varies across regions, with an estimated rate of 1.04% in northern India. While there is no direct mention of CD in Ayurvedic texts, the concept of *Asatmyata* (intolerance or incompatibility) can be correlated with the condition.

Methods:

Information was compiled from classical Ayurvedic texts, online pediatric journals, research papers, and databases such as Medline and PubMed. Relevant studies and Ayurvedic recommendations were reviewed to assess the management of celiac disease through Ayurvedic principles.

Results:

Ayurveda approaches CD management by focusing on *Nidan Parivarjan* (elimination of causative factors such as gluten), immune modulation, rejuvenation, correction of anemia, and *Aam Pachana* (detoxification). Key Ayurvedic remedies like *Rasayana* therapies, *Triphala*, *Guduchi*, and *Shatavari* have shown promise in restoring digestive health and improving immunity.

Discussion:

Ayurveda provides a personalized and comprehensive strategy for managing celiac disease by addressing its root causes, balancing the doshas, and promoting digestion. It offers a complementary approach to the conventional gluten-free diet.

Conclusion:

This paper highlights the holistic Ayurvedic management of celiac disease and underscores its potential in supporting conventional treatment for enhanced patient outcomes.

Keywords: Celiac Disease, *Asatmyata*, Ayurveda, *Rasayana*, Immune Modulation, *Aam Pachana*

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CORRESPONDING AUTHOR	HOW TO CITE THIS ARTICLE?	TO BROWSE
Dr. Ankita, M.D. Scholar, Department of Kaumarabhritya, National Institute of Ayurveda (Deemed to be University), Jaipur (Rajasthan) Email ID: silluankita@gmail.com	Ankita, Kumar S.K., & Qadari A.A.J. Integrating Ayurveda in the Management of Celiac Disease: A Comprehensive Review. International Journal of Ayurveda360, 2(1), 596–608. https://doi.org/10.63247/3048-7390.vol.2.issue1.5	

Manuscript Received	Review Round 1	Review Round 2	Review Round 3	Final Updated Received
18/06/2025	26/08/2025	03/07/2025	21/07/2025	24/07/2025
Accepted	**Conflict of Interest**	**Funding**	**Ethical Approval**	**Plagiarism Checker**
25/07/2025	NIL	NIL	NIL	9%

Introduction

Celiac disease is an immune-mediated systemic disorder triggered by the consumption of gluten, characterized by small intestinal damage, the presence of celiac-specific antibodies, and the association with human leukocyte antigen (HLA)-DQ2 or HLA-DQ8. The clinical manifestations are often gluten-dependent.[1] In northern India, the prevalence of HLA-DQ2 and HLA-DQ8 in the general population is reported to be 9.9% and 15.6%, respectively, while in southern, Dravidian-speaking populations, the prevalence of HLA-DQ2 and HLA-DQ8 is 4.4-7.3% and 4.7-5.1%, respectively. Wheat consumption is higher in the so-called "celiac belt" of northwestern India, where it is a staple part of the diet. This dietary pattern may explain the higher occurrence of celiac disease in northern India.[2]

Between 1966 and 2000, 130 cases of celiac disease were reported in India, while from 2001 to 2005, the number rose to 517. The increase in reported cases can be attributed to the introduction of serologic testing, such as EMA and anti-tTG testing, which helped distinguish celiac disease from other conditions such as tropical sprue, tuberculosis, and small bowel bacterial overgrowth. A study by Sood et al. found a prevalence rate of one in 310 children diagnosed with celiac disease from a sample of 4347 school-age children in Punjab, India, using a case-finding approach based on anti-tTG testing.[3]

Clinical manifestations of celiac disease in India typically present as chronic diarrhea, anemia, and stunting in children. However, atypical cases have been increasingly recognized, with symptoms such as short stature, anemia, abdominal distention, rickets, constipation, diabetes mellitus, and delayed puberty. These atypical cases are more commonly seen in older children, highlighting the evolving clinical presentation of the disease.[4]

Celiac disease results from the ingestion of gluten, a protein found in wheat, barley, and rye. Gluten is rich in glutamine and proline, which are difficult to digest in the human gastrointestinal tract. Gliadin, the alcohol-soluble fraction of gluten, contains the most toxic components. Undigested gliadin molecules, including a peptide composed of 33 amino acids from the α-gliadin fraction, are resistant to degradation by gastric, pancreatic, and intestinal brush-border membrane proteases. These peptides remain in the intestinal lumen after gluten ingestion, where they can pass through the epithelial barrier and interact with antigen-presenting cells in the

lamina propria, potentially triggering an autoimmune response.[5]

The disease classically presents with gastrointestinal symptoms such as diarrhea, bloating, weight loss, and abdominal pain, though it can also include extra-intestinal symptoms such as iron-deficiency anemia, stunted growth, delayed puberty, and mouth ulcers. Certain groups, such as children with a strong family history of celiac disease, certain genetic disorders, and other autoimmune conditions, are at higher risk for developing the disease.[6] Feeding patterns in the first year of life and viral infections, such as rotavirus, have been implicated in the development of celiac disease.[7] A study has suggested that increased frequency of rotavirus infection in early childhood may predict a higher risk of celiac disease autoimmunity.[8]

Ayurvedic Perspective

In Ayurveda, Asatmyata (imbalance) can be correlated with celiac disease. Ayurveda emphasizes the concept of Satmya Ahar, where Ahar (food) suitable for the individual is termed Satmya, and it is considered to cause comfort to the body and is accepted by the Atma (self). In contrast, Asatmya Ahar refers to food that is not suitable for the body and causes discomfort. Satmya is divided into two types: one achieved through artificial methods (kritimasatmya) and one through natural means (akrtima satmya). Asatmya is the opposite of Satmya, leading to discomfort and potential harm to the body, which could contribute to autoimmune diseases.

Autoimmune diseases occur due to failure in the mechanisms of immunological tolerance, resulting in reactions against the body's cells and tissues.[9] In celiac disease, Th1-type cytokines promote pro-inflammatory responses, and an excess of these responses can lead to tissue damage and autoimmune reactions. On the other hand, Th2-type cytokines promote IgE and eosinophilic responses. The ideal immune response would balance both Th1 and Th2 mechanisms, thus preventing excessive inflammation while protecting the body.[10]

In Ayurveda, the disturbance of Satmya and exposure to factors that are Viruddha (opposing or contradictory) to the body's natural balance can result in disorders like autoimmune diseases. The immune system's failure to maintain a balanced response can exacerbate inflammatory and hypersensitivity conditions. Thus, Satmya Viruddha and Atma Satmya Viruddha may contribute to the development of autoimmune disorders, including celiac disease.

Aim and Objective

1. To identify the key Ayurvedic principles and concepts that

underpin the treatment of celiac disease.

2. To analyze the literature on Ayurvedic management of celiac disease.

Materials and Methods

The study's primary materials were collected from Ayurvedic classics such as the Charaka Samhita and Sushruta Samhita, as well as contemporary textbooks and digital media resources, including the A.Y.U.S.H. Research Portal, PubMed, Google Scholar, and other subject-specific websites.

Management

Dhatri Lauha: Its ingredients are nutritional, Rasayana (rejuvenating), and PittaShamaka (pacifying Pitta) in property. It consists of Dhatri (Amalaki – *Emblica officinalis Gaertn.*), Yasthimadhu (*Glycyrrhiza glabra Linn.*), Guduchi (*Tinospora cordifolia (Willd) Miers. ex Hook. f. and Thoms.*), and Lauha Bhasma (oxide of iron). All ingredients have Rasayana properties. Dhatri is Tridoshahara, especially PittaShamaka; Yasthimadhu is Madhura, promotes strength and complexion, pacifies Pitta, Rakta, and has mild purgative properties; Guduchi has Tridoshahara (pacifies Vata, Pitta, and Kapha), Balya (strength-promoting), PanduNashaka (cures anemia), Deepana (appetizer), Pachana (digestive), Krimighna (anthelmintic), and RaktaVardhaka (hematinic) properties. Lauha Bhasma (Lauha Rajas) is considered one of the best Pandu Roga Nashaka, Tridoshahara, and is found in many formulations for the treatment of Pandu and Pitta Roga. The presence of ascorbic acid (vitamin C) in Amalaki has a significant effect on iron bioavailability from cereals and pulses in vitro. Lauha Bhasma also has significant hematinic and cytoprotective activity, supporting hemoglobin regeneration efficacy.[11]

The aqueous extract of P. emblica fruit exhibited dose-dependent immunomodulatory activity in albino rats with a dose of 100 and 200 mg/kg for 19 days. The fruit extracts significantly increased the hemagglutination antibody titer, leukocyte count, the percentage of lymphocytes distribution, and delayed hypersensitivity in mice.[12] Phyllanthus emblica enhanced the effectiveness of the immunomodulatory system by raising blood levels of CD4, CD8, CD16, CD19, IgM, IgG, albumin, and globulin levels in the serum. The P. emblica group, at a dose of 250 mg/kg b.wt., exhibited the most appreciable outcomes in increasing immunity.[13]

Punarnava Mandura: Punarnava Mandura is Kashaya (astringent), Laghu (light), Ruksha (dry), Shita (cold), Katu, and Pittakapha Shamaka. Triphala, an

Ayurvedic Rasayana, is antianemic and anti-oxidant. It contains Amalaki (*Emblica officinalis Gaertn.*), which is Rochana, Deepana, and Anulomana, contributing to digestion, absorption, and motility of digestive materials in the gut. As Hridya, Yakrututtejaka, and Shonita Sthapana, it has a direct action on Rasavaha and Raktavaha Srotas. It is considered a potent Rasayana, enhancing the essence of all the Dhatus. Amalaki is a rich source of iron and Vitamin C. Trikatu is a known bioavailability enhancer. Gomutra (cow urine) is an important ingredient of the drug and has been proven for its antimicrobial, antioxidant, and antianemic effects due to its erythropoietin stimulating factor. The use of buttermilk as an Anupana aids digestion due to the presence of probiotics and is a rich source of minerals and Vitamin B12.[14]

Chitrakadi Vati: The ingredients of Chitrakadi Vati, including Chitraka (*Plumbago zeylanica*), Pippali (*Piper longum*), Chavya (*Piper retrofractum Vahl.*), Shunthi (*Zingiber officinale*), Maricha (*Piper nigrum*), Ajamoda (*Carum roxburghianum*), along with various salts like Yava Kshara, Sarji Kshara, Saurvachala Lavana, Saindhava Lavana, Vida Lavana, Samudra Lavan, and Audbhida Lavan, collectively possess potent digestion-enhancing properties. The chemical composition of these ingredients reveals a rich array of bioactive compounds such as piperine, gingerols, plumbagin, and alkaloids, contributing to their pharmacological actions. These actions include anti-inflammatory, immunomodulatory, analgesic, antioxidant, antimicrobial, and lipid-lowering effects.[15] The immunoregulatory potential of P. longum and piperinic acid, one of its active constituents, in Balb/C mice (in vivo) and human PBMCs (in vitro) models showed a dose-dependent decrease in lymphocytes (CD4+ and CD8+ T cells) and cytokine levels in sensitized Balb/C mice with a marked inhibition.[16] The alcoholic extract of P. longum and its component piperine has been studied for their immunomodulatory properties.

Mustakarishta: The main ingredient of Mustakarista is Musta (*Cyperus rotundus L.*), which is known for its Agrya karma (foremost substances) as Sangrahika (constipative), Deepana (appetizers), and Pachana (digestive). The Katu rasa, Laghu Ruksha guna, and Ushna veerya of other ingredients help in attaining Deepana (appetizers) and Pachana (digestive) karma, as well as dravashoshaka (dries up the moisture) karma. Ingredients like Shunti (*Zingiber officinale Roscoe*), Maricha (*Piper nigrum Linn.*), Chitraka (*Plumbago zeylanica Linn.*), and Pippali

(*Piper longum Linn.*) belong to Deepaneeya (group of appetizers) and Shoolaprashamana Mahakashaya (group of anti-spasmodics), while Dhataki (*Woodfordia fruticosa Kurz.*) belongs to the Purishasangraganeeya Mahakashaya (group of bowel binders). Previous studies on the phytochemical analysis of alcoholic extracts of Mustakarista have shown the presence of tannins, flavonoids, alkaloids, glycosides, and volatile oils. All these phytoconstituents are responsible for achieving the anti-diarrheal activity.[17] The release of histamine and β-hexosaminidase during allergic reactions can be used as biomarkers for allergic responses in mast cells. Furthermore, inhibition of the 5-LOX (lipoxygenase) enzyme, which produces mediators of allergic reactions like leukotrienes, is a measure of antiallergic action. In vitro studies have demonstrated the inhibitory effects on β-hexosaminidase and 5-LOX, as well as in vivo studies examining delayed-type hypersensitivity (DTH).[18]

Jeerakarista: Jeerakarishta is Katu-Tikta-Madhura pradhana in Rasa, Laghu Ruksha in guna, Ushna virya, and has Katu Vipaka. The Katu rasa, Ushna virya of Jeerakarishta acts as Deepana and Pachana, thereby improving the Agni (digestive fire). This helps in the elimination of Amadosha (toxins). Once digestion is improved, it aids in proper uttarottara dhatu formation, thus improving overall strength.[19] Jeerakarishta helps improve the digestion process, addressing problems like flatulence, gas formation, heartburn, nausea, abdominal pain, bloating, excessive thirst, loose stools, and mucus in stools. It is very effective in managing Malabsorption syndrome and malnutrition. This medicine helps in increasing the absorption of nutrients, fulfilling nutritional deficiencies in the body.[20]

The anti-ulcer activity of the aqueous extracts of Cuminum cyminum seeds against diclofenac sodium-induced stomach ulceration has been studied in rats, with results showing accelerated healing compared to omeprazole. Cumin extract also enhances gastric mucin protection and regeneration.[21] Additionally, the aqueous extract of Cuminum cyminum seeds was studied for its effects on diarrhea in albino rats.[22]

Management

Ksheerpaka Kalpana: It is a unique preparation in Ayurvedic pharmaceutics. With the help of milk, it promotes health and treats various diseases. Milk is a rich source of vitamins and minerals. It is Ajanmasatmya, easily accepted by children.

Ashwagandha (*Withania somnifera*) belongs to the genus Withania

and the family Solanaceae. Ras is Katu, Tikta, Kashaya, Guna, Snigdha, Laghu Veerya and Vipaka, and Ushna and Katu. It balances Tridoshas, especially Kapha and Vata.[23] Ashwagandha promotes better digestive health, and it is essential to comprehend the connection between gut health and overall well-being. The digestive system handles food digestion, nutrient absorption, waste removal, and the preservation of a balanced gut microbiota. An unbalanced digestive system can lead to bloating, constipation, diarrhea, and inflammation. Ashwagandha may help regulate stomach acid production, reducing symptoms of acid reflux and ulcers, as well as enhancing digestion and nutritional absorption by promoting the growth of beneficial gut flora.[24] Withaferin A and Withanolide E showed specific immunosuppressive effects on human B and T lymphocytes and on mouse thymocytes. Withanolide E had a specific effect on T lymphocytes, while Withaferin A affected both B and T lymphocytes.[25]

Shatavari has Tikta, Madhura Rasa, Sheeta Virya, and Madhura Vipaka.[26] The immunomodulatory property of Asparagus racemosus has been proven to protect rats and mice against experimentally induced abdominal sepsis. The percentage mortality in A. racemosus treated animals was significantly reduced, while the survival rate was comparable to the group treated with a combination of metronidazole and gentamicin. A. racemosus also shows antibacterial activity, supporting its immunomodulatory properties.[27]

The powdered dried roots of Asparagus racemosus promote gastric emptying in healthy volunteers, with effects comparable to the synthetic dopamine antagonist metoclopramide (Dalvi et al., 1990). It has been reported that A. racemosus, along with Terminalia chebula, protects the gastric mucosa against pentagastrin and carbachol-induced ulcers by significantly reducing both ulcer severity and ulcer index (Dahanukar et al., 1983).[28] Asparagus racemosus is an effective anti-ulcerogenic agent whose activity can be compared to that of ranitidine hydrochloride. A. racemosus inhibits the release of gastric hydrochloric acid and protects gastric mucosal damage. Therefore, the roots of the Shatavari plant in powdered form can be administered to chronic ulcer patients and others (Anil Mangal et al., 2004).[29]

Guduchi is an Ayurvedic drug used for Rasayan Chikitsa. Rasayan drugs act essentially on nutritional dynamics, rejuvenating the body and psyche. Rasayan denotes medicinal nutrition, rejuvenation, longevity, and immune enhancement.[30] Isolated chemical

compounds such as cordifolioside A and syringin from Guduchi are reported as immunomodulating agents in clinical studies. T. cordifolia stem alters the levels of enzymes such as catalase and stimulates lymphocyte cells, maintaining immune strength, highlighting the immunoprotective role of this shrub.[31] Guduchi compounds, including alkaloids, steroids, and aliphatic compounds, have shown potent immunoprotective activity in preclinical rat models.[32]

Bala is Madhura in Rasa and Vipaka, Laghu, Snigdha, Picchila in Guna, and Sita Virya. It is Vata Pitta hara, Balya, Brmhana, and Vrishya.[33] Methanolic extract of S. cordifolia aerial parts revealed antipyretic and anti-ulcerogenic properties in rats. The extract showed a reduction in pyrexia induced by TAB vaccine and an anti-ulcerogenic effect.[34]

Vidarikanda: Acharya Bhava Prakash mentioned the Brahniya and Rasayan properties of Vidarikanda. The intake of these drugs helps malnourished children improve their Bala and Varnya, leading to increased body weight, immunity, and overall health.[35] The ethanolic extract of the tuber increased the phagocytic activity of macrophages in a mice model. The extract also inhibited both cell-mediated and humoral immunity, supporting its potent immunomodulatory activity.[36]

Punarnava: Ethanolic extract of roots of Boerhaavia diffusa was evaluated for antistress and adaptogenic activity in albino mice, using swim endurance tests and cold restraint stress. The extract improved stress tolerance by significantly increasing swim duration and reducing elevated WBC, blood glucose, and plasma cortisol. Immunomodulatory activity was evaluated by carbon clearance assay and delayed hypersensitivity test. The extract significantly increased carbon clearance, indicating stimulation of the reticuloendothelial system. The extract also increased DTH response to SRBC in mice, comparable to Levamisole, indicating stimulatory effects on lymphocytes and accessory cell types required for the expression of reactions.[37]

Discussion

Celiac disease is a modern biomedical condition defined as an autoimmune disorder where ingestion of gluten—a protein found in wheat, barley, and rye—triggers an immune response that damages the lining of the small intestine in genetically susceptible individuals. This leads to malabsorption and a variety of symptoms such as diarrhea, fatigue, bloating, anemia, and skin rashes. Diagnosis typically involves serological tests (like anti-tTG or anti-EMA antibodies) and confirmation

through intestinal biopsy. The only current treatment is strict, lifelong avoidance of gluten.

In contrast, Ayurveda conceptualizes Asatmyata as a state of intolerance or incompatibility—either to food, behavior, or environment—arising from disturbed balance in the body's internal systems. It is not focused on a specific protein like gluten, but rather on the body's inability to tolerate certain substances due to impaired Agni (digestive fire), accumulation of Ama (toxins), weakened Ojas (vitality), or imbalances in the doshas (Vata, Pitta, Kapha). The manifestation of Asatmyata varies according to an individual's constitution (Prakriti) and can present with similar symptoms, including indigestion, bloating, fatigue, skin issues, and chronic gastrointestinal disturbances.

While celiac disease is considered an autoimmune disorder, Ayurveda interprets similar pathology as a result of consuming Asatmya ahara (incompatible foods), leading to doshic disturbances and impaired digestion. In the Ayurvedic framework, wheat or gluten could be seen as Asatmya for certain individuals whose systems are unable to adapt or digest it properly—especially if digestive strength is weak or if Agni is impaired.

Biomedicine focuses primarily on the strict elimination of gluten, while Ayurveda aims to remove the incompatible food, restore Agni, detoxify the system, and rebuild strength using Rasayana therapies.

Celiac disease has a triad of anemia, malabsorption, and failure to thrive. Guduchi, lauha bhasma, amalaki, triphala, and gomutra have an antianemic effect. Triphala, Punarnava, Shatavari, and Guduchi have immunomodulatory effects; these act as rasayana. Musta, jeerak, ashwagandha, shatavari, and bala have anti-ulcer effects. Punarnava and musta have the property of delayed hypersensitivity.

In celiac disease, Nidan parivarjan, immune modulation, rejuvenation, correction of anemia, and Aam pachan should be done. Nidan parivarjana—wheat, rye, and barley contain gliadin, which celiac disease patients cannot digest, so these food items should be avoided. Anemia—due to malabsorption of food—leads to anemia. Ayurvedic drugs like Dhatri Lauha and Punarnava Mandura can be given for anemia.

Aam pachan—indigestion leads to symptoms like diarrhea, nausea, vomiting, and poor weight gain, so aam pachan should be done. For that, many medicines mentioned in Ayurveda, like Chitrakadi Vati, Mustakaristha, and Jeerakaristha, Ksheerpaka can be given with ashwagandha, shatavari, amrita, musta,

punarnava, bala, or vidari churna. These complex brinhan, vaysthapna, and pachan dravyas are included.

Conclusion

Celiac disease is a complex autoimmune disorder that requires a comprehensive treatment approach. While conventional treatments focus on gluten avoidance and symptom management, Ayurveda offers a holistic perspective on managing celiac disease. By addressing the root causes of the disease, incorporating dietary modifications, herbal remedies, and lifestyle changes, individuals with celiac disease can experience improved digestive health, reduced inflammation, and enhanced overall well-being.

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