WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 12, Issue 1, 312-319. Review Article ISSN 2277– 7105

ROLE OF NUTRACEUTICAL INGREDIENTS IN GASTROINTESTINAL DISORDER

Dr. Md. Wasiullah[1], Piyush Yadav[2]*, Shivam Yadav[3] and Pooja Yadav[4]

[1]Principal Dept. of Pharmacy – Prasad Institute of Technology, Jaunpur -222001 (U.P.), India.

[2]Principal Dept. of Pharmacy – Prasad Polytechnic, Jaunpur -222001 (U.P.), India.

[3]Dept. of Pharmacy – Prasad Institute of Technology, Jaunpur -222001 (U.P.), India.

[4]Assistant Professor Dept. of Pharmacy – Prasad Polytechnic, Jaunpur -222001 (U.P.), India.

Article Received on
12 Nov. 2022,
Revised on 02 Dec. 2022,
Accepted on 22 Dec. 2022
DOI: 10.20959/wjpr20231-26646

***Corresponding Author**
Piyush Yadav
Principal Dept. of Pharmacy – Prasad Polytechnic, Jaunpur -222001 (U.P.), India.

ABSTRACT

The dietary result on destroy by fire health has extended been documented through the empirical put into practice of soothing gastric discomfort with certain sorts of food, and recently the association between exact diets with lower incidences of several gastrointestinal diseases has been revealed. Ingredients from those measured beneficial foods are isolated and studied, and a few of them have already been put into the supplement market. During this review, we specialize in latest studies of these food-derived ingredients for their proposed preventive and therapeutic roles in gastrointestinal disorders, with the attempt of sketch evidence-based suggestions on intense these products.

KEYWORDS: Functional gastrointestinal disorders; structura gastrointestinal disorders; nutraceuticals; clinical trial.

INTRODUCTION

The significance of diet in disease avoidance has long been noticed. From the jingle saying ‘An apple each day keeps doctor away’, to modern science supported studies, people’s opinions are shaped about what a healthy eating should be look like. As an example, limited sugar and salt intake may be a key to help with universal good health.[1,2] As for the well-being of the gut, fruit, vegetable and yogurt intake are suggested for gut health promotion.[3,4,5] Now, dietary supplements became a fast-growing market, which incorporates a range of kinds of products from vitamins to single ingredients from botanic extracts, to

blends of extracts and ingredient from plants and food. Nutraceutical, as a term mixed from 'nutrition' and 'pharmaceutical', has been defined as "a food (or a part of a food) that provides medical or health benefits, including the prevention and/or dealing of a disease".[6] In terms of nutraceuticals being categorized as dietary supplements within the US, there has been a long-lasting debate about the meagerness of their bylaw. Unlike a drug, a nutraceutical product can skip the trial phase before it hits the market, from which era point, under the regulation of Dietary Supplement Health and Education Act (DSHEA) of 1994, the FDA may intervene on any apprehension about the product's safety and promotional claims.[7] Hence controversy persists that specialize in product efficacy and safety, as they'll be compromise under several circumstances, like limited thoughtful of interaction between ingredients from a whole botanic extract, or lack of sufficient tests and trials, or maybe the tainting of drug ingredients.

Gastrointestinal (GI) disorders are often practical or structural, with practical GI disorders because the more common type among the two[8], and both sorts of disorders may cause severe impairment of life quality and psychological wellbeing, and even shortened anticipation.[9,10,11] Many nutraceutical products have appeared on the market planned as beneficial for gastrointestinal disorders. During this review, we make our try and evaluate several commonly seen foodstuffs based on a standard established from the strength of available confirmation (**Figure 1**).

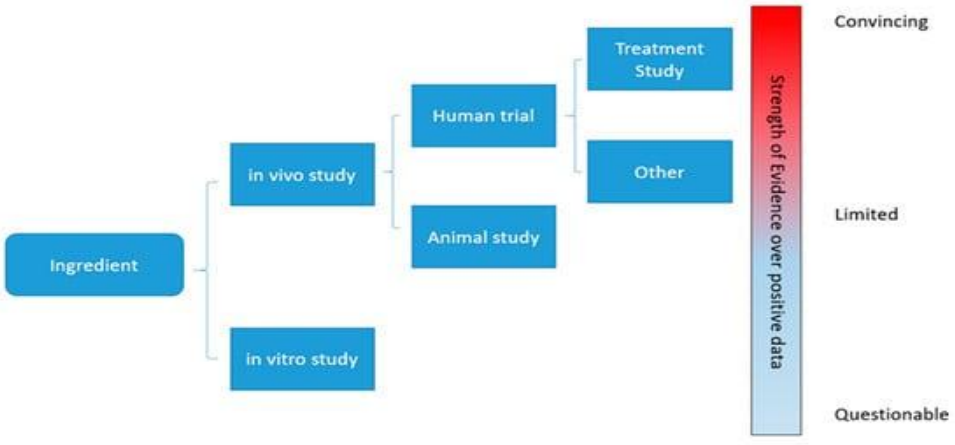

Figure 1. Strength of evidence levels for evaluation.

2. Role of Nutraceutical Ingredients in Gastrointestinal Disorders

Functional Gastrointestinal Disorders

Functional gastrointestinal disorders ask situation of normal body behavior such as the compassion of the nerves in the intestines, the movement of the intestines and therefore the way that the brain joystick the intestines, which are impaired while no structural abnormalities are often observed by endoscopy, x-ray, or other tests.[12] They're the most common problems affecting the GI tract. About one quarter of individuals in the U.S. have one among the functional gastrointestinal disorders.[13]

Functional GI disorders are a gaggle of disorders of gut-brain contact related to altered mucosal and immune function, altered gut micro biota, motility disturbance, and visceral hypersensitivity. Constipation, touchy bowel syndrome (IBS) and functional acid stomach are the familiar examples. Nutraceutical ingredients for various GI disorders are summarized in Table 1.

S No.	Nutraceuticals	Categories	Gastrointestinal Disorders	Study Object	Outcomes
1	Senna	TCM/Anthraquinone	Constipation	human	Anti-constipation effect
2	Curcumin	Flavonoid	IBD	human	Improved clinical activity index
3	Aloe vera gel	TCM	Acid reflux	human	Effective for reducing the symptoms of GERD
4	GABA	Amino acid	Colon cancer	Animal (mouse)	Anti-proliferative effect
5	Apiaceae	TCM	FD	human	Relieve the symptoms of FD

Constipation

Constipation is a familiar gastrointestinal complaint that refers to shy coliseum movement or hardness of passing intestinal contents.[17] Difficulty in defecation is one of the generally seen symptoms associated with hard and dry coprolite.[18] Continuity of constipation can last for weeks or indeed longer, which may raise the requisite of medical intervention. Substances that either loosen droppings or stimulate a bowel movement are called laxatives. For occasional constipation, laxatives are generally recommended for helping defecation. Lots of botanic products can promote this salutary effect, and have been used indeed from ancient times.

Senna is one of the substantially used curatives which come from a main set of botanic laxatives, anthraquinone medicines. The class also has cascara, frangula, aloe, and rhubarb included, and is amended in corresponding shops and sauces in forms of glucoside derivations of anthracene, i.e., the anthraquinones.[15] Theanti-constipation effect of anthraquinone medicines comes from revision of motility patterns and adding of colonic fluid volume.[14] As some anthraquinone derivations approved by FDA, the efficacity of senna or other anthraquinone containing botanic excerpts can be anticipated.

It was misdoubted whether the consumption of senna might associate with an adding threat of colon cancer[19], though studies on rodents are in disagreement.[20] Cascara, like senna, is a type of anthranoid containing laxative. Cascara contains anthraquinone glycosides(similar as cascarosides A, B, C, and D) and a small quantum of anthraquinone glycosides. quite a few clinical trials have reported that cascara can ameliorate coprolite frequence and thickness(). Psyllium is a frequent bulk laxative for constipation.

Psyllium was confirmed to increase coprolite frequence and ameliorate coprolite thickness.[21] Still, psyllium has its disadvantages. For case, cases may lose appetite and have a of detention gastric evacuating if taking psyllium before refections. In totaling its texture influences the compliance.[22] A randomized clinical trial with 72 subjects has shown that mixed fiber from fiber supplements is inversely efficient in perfecting constipation compared with psyllium. Mixed string is well permitted and further effective in let-up flatulence and bloating.[16]

Irritable Bowel Syndrome (IBS)

IBS is a functional bowl condition that manifests as disruptions in urination and faeces.[23] in comparison to other G.I. IBS is unique among gastrointestinal disorders in that it frequently co-occurs with mental health issues such anxiety, sadness, and somatization. While the cause of this illness is yet unknown, it is believed that 60% of IBS patients experience serious psychological issues.[24,25,26] Despite the fact that the cause of IBS is still unclear, altering the gut microbiota has been shown to reduce symptoms and enhance patient well-being.[27]

Conclusions and Future Directions

GI diseases remain current and delicate- to- manage complaint situation. The nutraceuticals have demonstrated natural goods by linking the biochemical responses as substrates, cofactors and impediments of precise enzymes or receptors. There's increasing interest in the use of these nutraceuticals to administer gastrointestinal diseases. Generally, nutraceuticals

are considered to be safer than conservative pharmaceutical curatives, which encourage the cases to relate indispensable options to palliate symptoms of GI diseases.

In this evaluation, we looked at more than a few nutraceutical constituents, and rather on the fine characterized, single element products. Reasons for being skeptical on constituents, especially composites or whole factory excerpts, are associated to recognition of the active pharmaceutical component and the yet to be understand onset mechanisms. For illustration, soy protein can inferior blood cholesterol in the mortal body[28], though the debate was on whether it was the protein itself, or the fiber contained, or some other constituents that were responsible for the effect. Different suggestions were made, like saponins or isoflavone[29,30], both supported by studies, which indicates a fact that active constituents from food may, and could be veritably probably; cooperate to deliver those good goods as we're waiting. A thorough chemical and natural description of active constituents that may interrelate is hard and generally yet to be completed for a clear construal of using a certain component, indeed if it's formerly on the request. Although mounting substantiation showing nutraceuticals may help to treat conditions like GI diseases, there's still an extended way to go before putting nutraceuticals as considerable differences or complementation of medicines, and sweats should be made pivotally in the organization of artificial standardization and acceptable, more active product directive.

REFERENCE

1. Asaria, P.; Chisholm, D.; Mathers, C.; Ezzati, M.; Beaglehole, R. Chronic disease prevention: Health effects and financial costs of strategies to reduce salt intake and control tobacco use. *Lancet,* 2007; *370:* 2044–2053. [Google Scholar] [CrossRef]
2. Lustig, R.H.; Schmidt, L.A.; Brindis, C.D. The toxic truth about sugar. *Nature,* 2012; *482:* 27–29. [Google Scholar] [CrossRef] [PubMed]
3. Adolfsson, O.; Meydani, S.N.; Russell, R.M. Yogurt and gut function. *Am. J. Clin. Nutr.*, 2004; *80:* 245–256. [Google Scholar] [CrossRef] [PubMed]
4. Morelli, L. Yogurt, living cultures, and gut health. *Am. J. Clin. Nutr.*, 2014; *99:* 1248S–1250S. [Google Scholar] [CrossRef][Green Version]
5. Michels, K.B.; Giovannucci, E.; Chan, A.T.; Singhania, R.; Fuchs, C.S.; Willett, W.C. Fruit and vegetable consumption and colorectal adenomas in the nurses' health study. *Cancer Res.,* 2006; *66*: 3942–3953. [Google Scholar] [CrossRef][Green Version]

6. Brower, V. Nutraceuticals: Poised for a healthy slice of the healthcare market? *Nat. Biotechnol*, 1998; *16:* 728–731. [Google Scholar] [CrossRef]
7. Kalra, E.K. Nutraceutical—Definition and introduction. *AAPS Pharmsci*, 2003; *5:* 27–28. [Google Scholar] [CrossRef][Green Version]
8. Mitchell, C.M.; Drossman, D.A. Survey of the Aga Membership Relating to Patients with Functional Gastrointestinal Disorders. *Gastroenterology*, 1987; *92*: 1282–1284. [Google Scholar] [CrossRef]
9. Schonberg, M.A.; Breslau, E.S.; Hamel, M.B.; Bellizzi, K.M.; McCarthy, E.P. Colon cancer screening in U.S. adults aged 65 and older according to life expectancy and age. *J. Am. Geriatr. Soc.*, 2015; *63*: 750–756. [Google Scholar] [CrossRef]
10. Chang, L. Review article: Epidemiology and quality of life in functional gastrointestinal disorders. *Aliment. Pharmacol. Ther.*, 2004; *20:* 31–39. [Google Scholar] [CrossRef]
11. Mason, H.J.; Serrano-Ikkos, E.; Kamm, M.A. Psychological morbidity in women with idiopathic constipation. *Am. J. Gastroenterol*, 2000; *95:* 2852–2857. [Google Scholar] [CrossRef] [PubMed]
12. Drossman, D.A. Functional Gastrointestinal Disorders: History, Pathophysiology, Clinical Features and Rome IV. *Gastroenterology*, 2016; *150:* 1262–1279. [Google Scholar] [CrossRef][Green Version]
13. Lewis, M.L.; Palsson, O.S.; Whitehead, W.E.; van Tilburg, M.A.L. Prevalence of Functional Gastrointestinal Disorders in Children and Adolescents. *J. Pediatr*, 2016; *177:* 39–43. [Google Scholar] [CrossRef] [PubMed]
14. Mao, H.Y.; Wang, C.X.; Wang, Y.J. Synthesis of polymeric dyes based on waterborne polyurethane for improved color stability. *New J. Chem.*, 2015; *39:* 3543–3550. [Google Scholar] [CrossRef]
15. Cirillo, C.; Capasso, R. Constipation and Botanical Medicines: An Overview. *Phytother. Res.*, 2015; *29:* 1488–1493. [Google Scholar] [CrossRef]
16. Erdogan, A.; Rao, S.S.C.; Thiruvaiyaru, D.; Lee, Y.Y.; Adame, E.C.; Valestin, J.; O'Banion, M. Randomised clinical trial: Mixed soluble/insoluble fibre vs. psyllium for chronic constipation. *Aliment. Pharm. Ther.*, 2016; *44:* 35–44. [Google Scholar] [CrossRef][Green Version]
17. Chatoor, D.; Emmnauel, A. Constipation and evacuation disorders. *Best Pract. Res. Clin. Gastroenterol*, 2009; *23:* 517–530. [Google Scholar] [CrossRef] [PubMed]
18. Morgan, R.D.; Stamatopoulou, S.; Mescallado, N.; Saunders, G.; Welch, R.; Mitchell, C.; Hasan, J.; Clamp, A.R.; Jayson, G.C. Screening tool for malignant bowel obstruction in

relapsed, metastatic ovarian cancer. *ESMO Open*, 2019; *4:* e000463. [Google Scholar] [CrossRef] [PubMed][Green Version]

19. Brusick, D.; Mengs, U. Assessment of the genotoxic risk from laxative senna products. *Environ. Mol. Mutagen*, 1997; *29:* 1–9. [Google Scholar] [CrossRef]
20. Mitchell, J.M.; Mengs, U.; McPherson, S.; Zijlstra, J.; Dettmar, P.; Gregson, R.; Tigner, J.C. An oral carcinogenicity and toxicity study of senna (Tinnevelly senna fruits) in the rat. *Arch. Toxicol*, 2006; *80:* 34–44. [Google Scholar] [CrossRef]
21. Soltanian, N.; Janghorbani, M.; Adibib, P. Effects of psyllium vs. placebo on constipation, weight, glycemia, and lipids: A randomized trial in patients with type 2 diabetes and chronic constipation. *Complement. Ther. Med.*, 2018; *40:* 1–7. [Google Scholar] [CrossRef]
22. Rao, M.R.P.; Sadaphule, P.; Khembete, M.; Lunawat, H.; Thanki, K.; Gabhe, N. Characterization of Psyllium (*Plantago ovata*) Polysaccharide and its Use as a Binder in Tablets. *Indian J. Pharm. Educ.*, 2013; *47:* 154–159. [Google Scholar]
23. Thompson, W.G.; Longstreth, G.F.; Drossman, D.A.; Heaton, K.W.; Irvine, E.J.; Muller-Lissner, S.A. Functional bowel disorders and functional abdominal pain. *Gut.*, 1999; *45:* 43–47. [Google Scholar] [CrossRef]
24. Levy, R.L.; Olden, K.W.; Naliboff, B.D.; Bradley, L.A.; Francisconi, C.; Drossman, D.A.; Creed, F. Psychosocial aspects of the functional gastrointestinal disorders. *Gastroenterology*, 2006; *130:* 1447–1458. [Google Scholar] [CrossRef][Green Version]
25. Kennedy, P.J.; Clarke, G.; Quigley, E.M.M.; Groeger, J.A.; Dinan, T.G.; Cryan, J.F. Gut memories: Towards a cognitive neurobiology of irritable bowel syndrome. *Neurosci. Biobehav. Rev.*, 2012; *36:* 310–340. [Google Scholar] [CrossRef]
26. Fond, G.; Loundou, A.; Hamdani, N.; Boukouaci, W.; Dargel, A.; Oliveira, J.; Roger, M.; Tamouza, R.; Leboyer, M.; Boyer, L. Anxiety and depression comorbidities in irritable bowel syndrome (IBS): A systematic review and meta-analysis. *Eur. Arch. Psychiatry Clin. Neurosci*, 2014; *264:* 651–660. [Google Scholar] [CrossRef] [PubMed]
27. Collins, S.M. A role for the gut microbiota in IBS. *Nat. Rev. Gastroenterol. Hepatol*, 2014; *11:* 497–505. [Google Scholar] [CrossRef] [PubMed]
28. Anderson, J.W.; Johnstone, B.M.; Cooknewell, M.E. Metaanalysis of the Effects of Soy Protein-Intake on Serum-Lipids. *N. Engl. J. Med.*, 1995; *333:* 276–282. [Google Scholar] [CrossRef]

29. Malinow, M.R.; Mclaughlin, P.; Papworth, L.; Stafford, C.; Kohler, G.O.; Livingston, A.L.; Cheeke, P.R. Effect of Alfalfa Saponins on Intestinal Cholesterol Absorption in Rats. *Am. J. Clin. Nutr.*, 1977; *30:* 2061–2067. [Google Scholar] [CrossRef] [PubMed]
30. Arai, Y.; Watanabe, S.; Kimira, M.; Shimoi, K.; Mochizuki, R.; Kinae, N. Dietary intakes of flavonols, flavones and isoflavones by Japanese women and the inverse correlation between quercetin intake and plasma LDL cholesterol concentration. *J. Nutr.*, 2000; *130:* 2243–2250. [Google Scholar] [CrossRef] [PubMed][Green Version]