From Ama and Agni To Leaky Gut Syndrome: Integrating Ayurvedic and Allopathic Concepts to Heal the Digestive System

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Outline

• Introduction to microbiome and leaky gut syndrome
• Imbalances in Agni leading to Ama
• My hypothesis connecting the two
• Overview of the 5R protocol
• Integrating Ayurvedic and allopathic concepts to heal digestion using the 5R approach
Importance of gut health in Ayurveda and allopathy

• A properly functioning Agni and digestive system is critical to good health
• 60–80% of our immune system is located in our gut
• Critically important gut bacteria – microbiome
• If your bacteria were lined up end-to-end, they would stretch all the way to the moon
• Gut-skin axis
• Gut-brain axis
Gut – The Second Brain

• A complex, independent nervous system called the enteric nervous system (ENS) lines the gastrointestinal tract.
• ENS contains many of the major neurotransmitters that are found in the brain, including serotonin, dopamine, glutamate, norepinephrine, and nitric oxide.
• >80% of our body’s neurotransmitters are made in the gut
• Intimate 2-way communication between gut and brain, mediated by many pathways including the vagus nerve
The Microbiome

• 100 trillion microorganisms from >1000 species
• 10 times more microbes than human cells in the body
• Provide crucial functions
  – Regulate metabolism
  – Protect against infections
  – Promote normal GI function/digestion
  – Synthesize certain essential nutrients
  – Regulate immune system
Leaky Gut Syndrome

• Leaky gut is defined as **increased intestinal permeability**
• Tight junctions in the gut, which control what passes through the lining of the intestine, don't work properly.
• That could let substances leak into the bloodstream that normally would not be allowed into the blood
Leaky Gut Syndrome Pathophysiology

• Once these tight junctions get broken apart, you have a leaky gut.
• When your gut is leaky, things like toxins, microbes, undigested food particles, and more can escape from your intestines and travel throughout your body via your bloodstream.
• Your immune system marks these "foreign invaders" as pathogens and attacks them.
Leaky gut syndrome causes

- Food sensitivities – e.g. gluten
- Excessive sugar and processed foods
- Too much alcohol
- Infections – bacterial, viral, fungal, parasitic
- Medications – ibuprofen or NSAIDs, steroids, antibiotics, aspirin, long-term oral contraceptives, acid-reducing drugs
- Toxins – heavy metals, pesticides, BPA, phthalates, etc.
- Chronic stress
Leaky Gut Progression

- Stress
- Toxins
- Food Particles
- Drugs
- Pathogens
- Organ Malfunction

GI Inflammation

Food Intolerances

Immune System Issues
Symptoms of leaky gut syndrome

• Digestive symptoms – bloating, gas, indigestion, nausea
• Food sensitivities
• Fatigue
• Aches and pains, muscle or joint pain
• Headaches
• Skin issues like eczema, acne, or other rashes
• Elimination problems – constipation, loose stools, diarrhea
• Weight gain
Symptoms of Ama in Ayurveda

• “The signs and symptoms of ama are clogging of channels, sense of heaviness, low energy, restlessness, lethargy, indigestion, congestion/expectoration, accumulation of waste, loss of taste and sexual debility.”

– Ashtanga Hridaya Su. 30.23
Conditions linked with Intestinal Permeability

- Food allergies and sensitivities
- Atopic conditions
- Arthritis
- Rheumatoid Arthritis
- Asthma
- Chronic fatigue
- Chronic urticaria
- Crohn's disease
- Diabetes mellitus
- Ulcerative colitis
- Irritable bowel syndrome
- Thyroiditis
- Raynaud’s syndrome
- Cystic fibrosis

- Multiple sclerosis
- Spondyloarthropathies
- Acne
- Eczema
- Dermatitis herpetiformis
- Psoriasis
- AIDS, HIV
- Autism
- ADD/ADHD
- Environmental illness
- Exocrine pancreatic defects
- Poor digestion
- Iron deficiency
- Bowel cancers
- Vitiligo
- Vaculitis

(Galland 1995)
Leaky Gut Syndrome Cycle

1. Intestinal Inflammation of the Gut Lining
2. Autoimmune Disease
3. GI Issues and Multiple Food Intolerances
4. Immune Response
5. Nutrient Malabsorption (Vitamin B12 - Magnesium, Iron)
Ayurvedic concepts – Ama and Agni

• All disease begins in the gut
• Ama is the root cause of all disease
• Problems with Agni, such as weakening, vitiation or imbalance, predispose to creation of Ama
• Sama Agni, optimal metabolism and balanced digestion, can degenerate into one of the 3 imbalanced forms of Agni.
The 3 vitiated forms of Agni

• **Vishama Agni**, irregular metabolism and variable digestion, leading to Vatagenic Ama and vata disorders

• **Tikshna Agni**, sharp hot metabolism and quick digestion, producing Pittagenic Ama and predisposing to pitta diseases

• **Manda Agni**, slow weak metabolism and inefficient digestion, leading to Kaphagenic Ama and development of Kapha disorders
Ayurvedic Samprapti (pathogenesis)

• Ama is formed in the gastrointestinal tract and then enters the general circulation
• From here, it can affect Agni in the liver, impairing liver function
• Systemic ama can then enter and penetrate into the dhatuṣ, depending on the khavaigunya (defects or weak areas in the tissues which are likely to be first affected)
  – E.g. rheumatoid arthritis, where the khavaigunya is in the joints
Amavata (rheumatoid arthritis)

• Agni is vitiated, and develops into **Vishama Agni**, characterized by irregular metabolism and variable digestion
• Vatagenic Ama is produced
• Ama leaves the G.I. tract and travels to the dhatus, where the khavaigunya is in the joints
• Vatagenic Ama penetrates the khavaigunya (defective space) and covers the cells that line the joints
• Immune system fails to recognize these Ama-covered joint lining cells and attacks them
Amavata (rheumatoid arthritis)

- Initially, inflammation causes swelling and painful joints
- Continued inflammation can eventually lead to joint erosions and permanent deformity
Leaky gut leading to autoimmune disease

- In Ayurveda, most autoimmune disease results from overactive tejas burning ojas
- Vata and pitta prakrutis are especially prone to autoimmune disease because tejas is similar in qualities to vata and pitta
- Systemic ama can cover and obscure the cell membranes, preventing normal cellular communication
- This leads to cells failing to recognize neighboring cells and triggering the immune system to produce antibodies (specialized form of tejas) to destroy those cells
Antigen-Antibody Complex aka Immune Complex

- Antigen – protein markers on cell surface that immune system recognizes, on either human or microbial cells like bacteria
- Antibodies, or immunoglobulins – proteins produced by the immune system in response to antigens, identifying and binding to them.
- Part of normal immune response, & certain autoimmune diseases
Immune complex-mediated glomerulonephritis

Immune Complex Deposition

- e.g. post-streptococcal glomerulonephritis
  - streptococcal infection
    - usually group A
      - (S. pyogenes)
  - anti-strep antibody formation
  - immune complex formation
    - (antibody + strep fragments or products + complement)
  - immune complex deposition in glomeruli, leading to inflammation, kidney dysfunction

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SLE / Lupus

- Result in abnormal immune responses
- Generate pathogenic autoantibodies and immune complexes that deposit in tissue, activate complement
- Cause inflammation
- Lead to irreversible organ damage
Ayurveda pathogenesis – correlation with Allopathy

- **Agni Imbalance**
  - Sanchaya
  - Vyakti

- **GI Ama**
  - Prasara

- **Systemic Ama**
  - Khavaigunya

- **Chronic Inflammation**
  - Sthana Samshraya
  - Immune Activation

- **Tissue Damage**

- **Leaky Gut Syndrome**
  - Antigen-Antibody Complex
  - Toxin Translocates

- **Immune Complex Deposition**
  - Circulates through blood
Healing Imbalanced Agni/Leaky Gut Syndrome

• My approach – The 5R protocol
• Restore, remove, replace, reinoculate, and repair.
• Incorporates elements of Ayurveda and functional medicine, a branch of integrative medicine that seeks to diagnose and treat imbalances in the function of different body systems
1. Restore

• It’s imperative to restore optimal liver function to enhance detoxification and correct enzymatic production
• During the 2\textsuperscript{nd} step, when you are removing pathogenic organisms, the die-off will produce toxins that need to be cleared by the liver and intestines
• If body’s detoxification capacity gets overloaded you can have a Herxheimer reaction (die-off reaction)
2. Remove.

• Remove the bad. The goal is to get rid of things that negatively affect the environment of the GI tract, such as inflammatory and toxic foods that one has developed sensitivities to
• Remove pathogenic microbes, including harmful bacteria, viruses, fungi, and parasites
3. Replace.

- Replace the good. Add back the essential ingredients for proper digestion and absorption
- This includes digestive enzymes, hydrochloric acid and bile acids
4. Reinoculate.

- It’s critical to restore beneficial bacteria to reestablish a healthy balance of good bacteria
- Combination of dietary fiber, prebiotics, probiotics, and fermented foods works the best
5. Repair.

• Provide the nutrients necessary to help the gut repair itself, including substances that will help reverse increased intestinal permeability and heal leaky gut syndrome
• Reduce and reverse inflammation in the small and large intestine
1. Restore

• It’s imperative to restore optimal liver and intestinal function to enhance detoxification and correct enzymatic production.

• During the 2\textsuperscript{nd} step, when you are removing pathogenic organisms, the die-off will produce toxins that need to be cleared by the liver and intestines.

• If body’s detoxification capacity gets overloaded you can have a Herxheimer reaction.
Support Liver Function and Enhance Detoxification

• The importance of liver function in regards to overall health cannot be stressed enough. The liver is responsible for the detoxification of environmental toxins and pollutants.

• Reduce toxin exposure
  – Encourage eating organic
  – Sweating regularly
  – Updating household chemicals, cosmetics, etc.
Support Liver Function

• Incorporate cooked cruciferous vegetables (excessive raw crucifers can dampen Agni and also affect thyroid function)
• BEETS: Rich source of trimethylglycine (TMG), which supports methylation and healthy liver function
• Betalains ↑ activity of glutathione-S-transferase – Phase 2 liver detox
Support Liver Function and Enhance Detoxification

• Botanical options include:
  – bhumyamalaki
  – turmeric
  – bhringaraj
  – barberry
  – guduchi
  – manjista
  – milk thistle
Support Optimal Elimination

• Goal is 1-2 normal bowel movements daily
• Triphala – add a half teaspoon of triphala powder to a cup of hot water. Stir and allow the tea to cool, and drink at bedtime.
• Ensure adequate systemic lubrication with enough oil
• If constipation worsens add oral and topical sesame oil
• Sat isabgol (1 teaspoon mixed in water nightly) is a natural source of both soluble and insoluble fiber and serves as an effective demulcent and bulking agent for the colon
2. Remove.

• Remove the bad. The goal is to get rid of things that negatively affect the environment of the GI tract, such as inflammatory and toxic foods, and intestinal infections.
Remove offending foods

• Remove white sugar, trans fats, hydrogenated oils, and excessive processed foods
• Remove any foods that are known sensitivities
• Increase intake of fruits and vegetables
• Follow a diet appropriate for one’s prakruti/vikruti
Antibacterial and antiviral herbs

• Determine if there is any microbial overgrowth – virus, bacteria, fungi, or parasite – and treat accordingly

• Antivirals: Garlic (Allium sativum), St. John’s Wort (Hypericum perforatum), Lemon Balm (Melissa officinalis), and Neem (Azadirachta indica)

• Antibacterials: Barberry (Berberis vulgaris), Guggulu (Commiphora mukul), Purple Coneflower (Echinacea angustifolia), Uva-Ursi or Bearberry (Arctostaphylos Uva-Ursi) and Goldenseal (Hydrastis canadensis)
Antiparasitic and antifungal herbs

- **Antiparasitics:** Garlic (*Allium sativum*), Sweet Annie (*Artemisia annua*), Neem (*Azadirachta indica*), and Kutaji or bitter oleander (*Holarrhena antidysenterica*)
- **Fungicidals:** Sweet Annie (*Artemisia annua*), Neem (*Azadirachta indica*), Bhringaraj (*Eclipta alba*), Haritaki (*Terminalia chebula*), and Bibhitaki (*Terminalia bellerica*).
3. Replace.

- Replace the good. Add back the essential ingredients for proper digestion and absorption, such as hydrochloric acid, digestive enzymes, and bile acids.
- Low stomach acid, or hypochlorhydria, is recognized as a contributing factor to leaky gut syndrome
- Deficiencies in digestive enzymes and bile acids further impair digestion
Hypochlorhydria

- Hypochlorhydria can be inferred by the presence of pernicious anemia, chronic constipation, heartburn, persistent gas and bloating right after meals, and indigestion
- Sometimes seen in the iris as a darkish area around the pupil
- Other common nutrient deficiencies contributing to hypochlorhydria include mineral deficiencies such as chromium, copper, iron, magnesium, manganese, molybdenum, selenium and zinc, and of course, **chronic stress**
Hypochlorhydria

• Low stomach acid is treated by dealing with chronic stress issues and addressing mineral deficiencies
• Chew a piece of ginger dipped in lemon juice before meals
• Bitter herbs such as Gentian (Gentiana luteum) and Barberry (Berberis vulgaris) or digestive bitters before meals
• Digestive enzymes that include HCl and pancreatin
• Taking apple cider vinegar, 1-2 tablespoons in 4 ounces of water before meals, can be helpful
Digestive Enzymes

• Digestive enzymes are critical to properly breaking down the foods we eat. They are found naturally in the raw form of foods to help break them down

• Plant based enzymes will break down food into small particles before it leaves the stomach, preventing large undigested molecules from irritating the intestinal lining

• Pancreatin (animal source) or bromelain and papain enzymes (plant-based) are shown to reduce inflammation in the gut lining and throughout other tissues in the body
4. Reinoculate.

• It’s critical to restore beneficial bacteria to reestablish a healthy balance of good bacteria.
• Combination of dietary fiber, prebiotics, probiotics, and fermented foods works the best
Practical Tips To Improve Your Gut Flora

• avoid foods and chemicals which irritate the gut mucosal lining
• eat plenty of fermentable fibers [i.e. starches like sweet potato, yam, legumes, etc.]
• eat fermented items like kefir, yogurt, sauerkraut, kim chi, etc.
• consider taking a probiotic and prebiotic supplement
5. Repair.

• Provide the nutrients necessary to help the gut repair itself.
• Beneficial foods
  1. Bone Broth, rich in amino acids like glycine and gelatin
  2. Kefir or fermented yogurt
  3. Fermented vegetables like sauerkraut, kimchi, etc.
  4. Coconut oil
  5. Wild caught fish like Salmon, sardines
  6. Flax seeds and Chia seeds
Vegetarian options for repairing the gut lining

• L-glutamine
• Demulcent herbs are considered to be helpful in improving the integrity of the lining of the gut
• Demulcents include:
  – aloe vera
  – marshmallow root
  – slippery elm
  – licorice root
Chronic stress is a factor

- Mind-body stress reduction techniques are crucial
- Meditation
- Pranayama
- Yoga
- Visualization
Conclusion

- Digestive health is the foundation for overall health
- When in doubt, start treatment with the gut
- Cleanse Ama, determine status of Agni and work to rebalance Agni
- Combining Ayurvedic and Western medical understanding can provide tools to optimize gut healing
- Always customize to prakruti and vikruti
Remember: Healthy eating should be fun!

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