

GLOBAL INTERSTITIAL CYSTITIS, BLADDER PAIN SOCIETY

VOLUME 4, ISSUE 4 (SUPPL) (APRIL 2022)

NewsLetter

GIBS EXECUTIVE BOARD

- Dr. Rajesh Taneja (Chairman-GIBS)
- Dr. Sanjay Pandey (Secretary-GIBS)
- Dr. Rajeev Sood
- Dr. Uttam Mete
- Dr. Shivam Priyadarshi
- Dr. Apul Goel
- Dr. Ranjana Sharma
- Dr. Navita Purohit
- Dr. Amita Jain

CALL FOR NEWSLETTER ARTICLES

Be the

EX Author!

Please send your contributions to info@gibsociety.com

FOR ANY ASSISTANCE CONTACT US

- ➤ info@gibsociety.com
- +91 8169746459
- www.gibsociety.com

FOUNDER PATRON

SWATI SPENTOSE PVT. LTD.

JOIN US! BECOME A MEMBER OF GIBS https://gibsociety.com/become-a-lifetime-member/

⁶⁶The Gut Microbiome-A Necessity for GOOD HEALTH⁹⁹



Well... Let's nurture the Gut Microbiome too...

It's Spring (Vasant season) in India, and I have been these days feeling awesome and energetic. As if the love hormones, the dopamine, oxytocin gushing through my blood with full energy making me enthusiastic about writing this article. Feeling the positivity all around me, as if it is a new beginning. Yes! indeed... spring is all about a new beginning, blossoming of fresh buds, the dawn chorus of finches and that's when I felt, the most hated, the most cursed life on the planet earth; "the microbes"too needs to be loved, nurtured, and cherished.What provoked me to feel this way?... Last night while I was watching this video by Dr.Shivam Privadarshi, Core Member GIBS (Global Interstitial Cystitis Bladder Pain Society) and Senior Professor and Head of the Department of Urology, S.M.S Medical College & Hospital in Jaipur, India; He emphasized how some micro-organisms help us, support us and nurture us to overcome our health problems. Not all microorganisms are bad, there are good ones too; just the way it is said.

"Don't forget that the flavors of wine and cheese depend upon the types of infecting Micro-organisms"

-By Martin Fischer

"

Since time immemorial our spiritual masters and saints preached, that we are not just physical body that can be seen with naked eyes or the mind and brain that feels and thinks, but we have microbes residing in and on our body that are 10 times more than the total number of human cells. The genetic composition of microbes amounts to a stupendous 3 million genes which is 300 times more than the human genome. There are more than 1,000 species of bacteria which controls almostall the bodily functions. Around 80% of our immune system is in microbiome and 90% of chemicals like serotonin which is responsible for a sense of well-being come from micro-organisms. Our body isonly 10% human cells while the rest 90% is microorganisms. And... "when the Gut Microbiome is balanced, one feels healthy, happy, and energetic". Suddenly, I realized that the reason for my happiness, romantic and energetic feeling... lies in my gut microbiome which is playing a crucial role in my body. Thanks to my gut microbiome...

Wonder... How do these microbes enter the human body???

The entry of these microbes in the human body (skin, mucous membranes, upper respiratory tract, the GI tract, the urinary bladder, the urethra the external genitalia, vagina, ear canal and external eyes) is via. four stages of development from the foetal stage to the adult stage. During the foetal stage of development, the gut is usually sterile, but during a normal delivery the baby acquires bacteria from the vagina of the mother, the faeces and the hospital environment. Later in the developmental stage, the human body (baby) acquires different microbiome fromdifferent modes of feeding. i.e. breastfeeding or bottle-feeding. Breastfeeding gives more of Bifido bacteria, while bottle-feeding gives Bacteroides and Clostridial species. The flora changes as weaning starts with solid food and gradually it acquires the adult flora.

After the Human Genome Project in 1990, the Human Microbial Genome Projectis the new study where samples taken from the different sites of the human bodyi.e., the nasal passages, oral cavity, skin, GI tract and urogenital tract have shown their contribution to survival of humans, more than the human's own genes. The bacterial protein coding genes are 360 times more abundant than human genes and provides support in almost all functions of the body. They enhanceability to harvest nutrients, help in digestion, absorption, fermentation of carbohydrates, break up the pectin and starch into butyrate and acetate which helps to keep the intestinal epithelial lining and prevent inflammatory bowel disease. They produce vitamins like folic acid and biotin, produce additional energy, provide resistance to development of tumours and cancer. They assist in developing a mature immune system and prevent allergies. They prevent colonization of pathogens and antagonize other pathogenic bacteria by producing short chain fatty acids, bacteriocins and peroxidases which kills or inhibits pathogenic species.

Gut microbes also stimulate development of intestinal epithelial cells, lymphatics and capillary density. They prevent infection by producing cross-reactive antibodies.

Gut microbes also helps to reduce stress. It impacts the nervous system by triggering the HPA Axis (Hypothalamus Pituitary and Adrenal Axis). A neurotransmitter known as GABA is produced by these gut microbes such as *Lactobacillus* and *Bifido* bacterium. Gaba neutralizes the over excited neurons and present a state of relaxation in the body.

Generally, we consider the colon to be metabolically inactive, but the colonic microbiome has mass almost equal to one kidney, and is metabolically as active as the liver. It produces 20 to 70 g of carbons, 5 to 20 g of protein per day and over 100 kilocalories per day. A skewed gut microbiome i.e. dysbiosis influences various disorders associated with the nervous system like autism, depression, anxiety, allergic problems like asthma, causeshypertension, ischemic heart disease, peripheral vascular disease and a major contributor of obesity, metabolic syndrome, inflammatory bowel disease and colon cancer.

A diet high in processed food and sugar, conventionally raised meat and dairy products which are full of hormones and excessive amounts of antibiotics, antacids along with chronic stress are the common sources of dysbiosis (imbalance in microflora) leading to impaired gut health. The increasing number of Caesarean-sections, the present trend of formula feeding instead of breastfeeding are an add on..contributing to an impaired gut microbiome state in new born and children .Hence, a healthy gut microbiome plays vital role in preventing various diseased conditions of the human body.

In a study of the role of gut microbiome in Interstitial cystitis/Bladder pain syndrome(IC/BPS)the large gut wasfound to influence the urinary bladder. Both the visceral organs are embryologically same in origin, developing from the cloaca, positioned close to each other in the pelvis on the same pelvic floor muscles and a joint peripheral innervation co-ordinate their function of storage and excretion of faeces and urine. Hence, urinary bladder and large bowel interacts via various cross reflexes. The cross talk and cross sensitization of the triad of brain, bowel and bladder may result in a multiple bladder bowel dysfunction and gut microbiome is considered to play a major role.

Few case-studies discussed here, emphasize the role of gut microbiome in the treatment and management of IC/BPS. On studying the class of microbiomes in IC/BPS and control samples, 26 significant features of microbiome were found in IC/BPS patients compared to controls and were more frequent in IC patients versus the control. As a corollary to this studyanother study showed thatthe stool-based biomarkers can be used for diagnosis of IC/BPS.

It is not just the gut microbiome, but the urinary microbiome also has a role to play and the dogma that urine is sterile in healthy individuals, no more holds true. The "Next Generation Sequencing" and extended quantitative cultures are the tools to prove that even the normal healthy urine has hundreds of species of bacteria of which 2/3rd is shared from the gut and 1/3rd from the vagina in females. Alterations and variations in the urine microbiome (abundant *Lactobacillus*) was noted in patients with IC/BPS compared to normal controls. Besides, the urinary microbiome, it is the vaginal microbiome which affects the symptoms of women with interstitial cystitis. Increased level of proinflammatory cytokine in women with IC/BPS was also a factor for developing IC/BPS.

In post menopausal women change in the vaginal environment causes symptoms of IC/BPS and use of exogenous estrogen cause changes in this vaginal environment by promoting Lactobacillus in vaginaA study showing the relation between interstitial cystitis and recurrent urinary tract infection (RUTI), chronic use of antibiotics (may change the natural vaginal microflora and may exert adverse effect) exhibited the potential role of the urinary microbiome in the pathogenesis of IC/BPS. It has been shown that alterations in the natural microflora may contribute to pain and voiding dysfunction in IC/BPS patients.Such alterations in vaginal microbiome may foster uropathogen reservoir expansion and may result in recurrent infections in these patients.

MAP research network which is a multidisciplinary approach to pelvic pain is a flagship study of N.I.D.D.K. In this study ,on analysis of patients of interstitial cystitis with their microbiome, overabundance *Lactobacillusgasseri* and low prevalence of *Corynebacterium*was seen. The study also showed the difference in microbiome in uncomplicated cystitis and interstitial cystitis patients. The study suggested that direct sampling of the bladder tissues would be more helpful than taking samples from the bladder surface or from the urine in diagnosis of IC.

One of the latest studies published in June 2021, showed that the bacterial microbiota of the inflammatory subtype of IC (Hunner's Lesions) is likely to be more associated with a specific bacterial species or amicrobial pattern rather than the non-hunner's variety of IC/BPS.

In spite ofstrenuous work afloat in this field, there remains many unanswered questions.

What is the impact of the bacterial flora during the flares of IC? Do they change or achieve normalcy during period of remission?

We know that *F.prausnitzii*, the good bacteria in colon that producebutyrate is useful to prevent inflammatory bowel diseases.Does the bladder lacking such good bacteria leads to breakage of the uro-epithelial barrier resulting in interstitial cystitis.

If diagnosis of IC is possible with a simple stool test by estimation of bacterial and fatty acid metabolite levels and if excessive use of antibiotics can be a contributing factor in IC, whether the restoration of existing bacterial levelsimprove the symptoms in IC patients...

In one such study, intravesical instillation of *Lactobacillus rhamnosus* was found to be a very safe and well tolerated particularly in adults and pediatric patients with neurogenic lower urinary tract dysfunction and IC/BPS. Faecal microbiota transplantation is now a highly proven effective treatment for patients suffering from Clostridium difficile infection led pseudomembranous colitisand liver disease.

Along with all the above-mentioned techniques, there exist agencies which actually analyze the gut microbiome of an individual to recommend a personalized prebiotic, probiotic and a dietary regimen for management of dysbiosis.

So, to conclude, it is just the beginning of Gut microbial research .Microbiomes contribute to the pathogenesis of IC/BPS directly by supplying uro- pathogens or indirectly through organ crosstalk dysfunction. The extended research and studies may have very far-fetched results which can radicallychange the way IC/BPS is dealt with. The gut microflora by their genes, by-products and metabolic activities influence human metabolism, immunity, health and diseases. Manipulation of the gut flora may be an integral part of different disease treatments in future.

Knowing the IC microbiome is essential may help us to accurately diagnose IC/BPS and might lead to new treatments that are directly targeted at organisms known to be prevalent in IC microbiome.

Thanks to the millions of microbes present in the gut and the body, which take care of ourselves in health and disease. So, hereafter I will definitely take care of my gut microbiome to keep me healthy and infuse happiness and energy in me.



Presenter

Dr. Shivam Priyadarshi

Sr. Professor and HOD Urology, S.M.S. Medical College & Hosp, Jaipur, India President, NZ Urological Society of India

Latest Announcement

