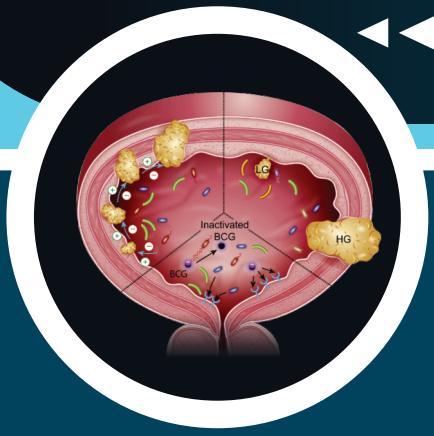
GLOBAL INTERSTITIAL CYSTITIS, BLADDER PAIN SOCIETY

VOLUME 4, ISSUE 1 (JANUARY 2022)

NewsLetter



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Understanding the Human Urinary Microbiome

1. Human microbiome

Microbiome are a community of microorganisms (such as bacteria, fungi and viruses) that live in a particular environment. The human microbiome is the set of genes of microorganism present in a given habitat or environment. The human microbiome matures from birth to adulthood and is critical in the development and maintenance of immune system.

The Human Microbiome project (HMP) included 300 samples, collected from the 15 - 18 specific body sites such as nasal areas, skin, oral cavity, gastrointestinal tract and urogenital tract. The urinary tract was excluded from the Human Microbiome Project. HMP found that each body site appears to have a unique microbiota, and no microbial taxa are universally present across all sites & individuals.[1]

Urobiome or Urinary microbiome

The theory that urine is sterile has been proved wrong with the identification of urinary microbiome in the healthy bladder. The female urinary microbiome (FUM) was discovered in 2011 by assessing the diversity through 16S rRNA gene sequencing.[2]

Wolfe et al used urine specimens of healthy adult women from voiding, transurethral catheterisation and suprapubic catheterisation and assessed the presence of bacteria using bacterial cultures, light microscopy and 16S RNA gene sequencing, and described uncultivated bacteria in women.[3]

It was found that each individual may have a core microbiome. The bacterial genera in women are more heterogenous and it changes with age. Conventional microbiological testing is inadequate to identify more than two - thirds of the bacteria.[4]

This healthy microbiome is thought to maintain the bladder homeostasis, by protecting against infection, promote normal immune function, neurotransmitter regulation and maintain the urothelial integrity[5].

Dysbiosis is defined as an imbalance between the healthy microbiota and the microbiota communities without the above mentioned functions[6].

This spectrum of urinary dysbiosis may help us understand the risk of clinical conditions, such as urinary tract infection (UTI), urinary incontinence (UI) and, some forms of bladder pain syndromes.

The most common urotype in the female bladder is Lactobacillus. The next most common urotypes are Streptococcus, Gardnerella, Corynebacterium and Staphylococcus. The host's hormonal status, body mass index and certain clinical conditions appear to have an influence on the FUM.[7]Urine was found to share 23.6% of species in the human gut microbiota.(8) This may be useful to understand the aetiology of some clinical conditions such as chronic pelvic pain, bladder pain syndrome.

Genitourinary microbiome(GUM) is the combination of vaginal and urinary microbiome, which is obtained from the voided urinary samples in women. It includes more than 100 species from 50 genera. The focus is to understand the relationship between GUM and lower urinary tract symptoms.[9]

Cultures methods :

Since 60 years, the Kass criterion is in use, which consists of the counting of bacteria cultured from fresh urine. Thus, the number of bacteria superior or equal to 105 CFU/ml was predictive of urinary tract infection (UTI). Therefore, the study of the urinary microbiota was unheard for a long time.[10]

Later, 562 bacteria were identified in the urinary tract, 322 were described only by culture, 139 by metagenomics &101 by both culture and metagenomics. The 8 more commonly found species in the literature wereChlamydia trachomatis, Neisseria gonorrhoeae, Escherichia coli, Staphylococcus aureus, Pseudomonas aeruginosa, Klebsiella pneumoniae, Proteus mirabilis, and Enterococcus faecalis . All are considered pathogenic.

As said before, standard culture techniques do not detect most species of FUM, including many uropathogens.[8]

Expanded quantitative urinary culture (EQUC) is the solution to detecting microbial species not detected by conventional urine cultures. The EQUC protocol could cultivate 80 % of the bacterial species found by 16S rRNA , majority (92%) showing no growth on bacterial cultures. The most prevalent genera isolated were Lactobacillus (15%), followed by Corynebacterium (14.2%), Streptococcus (11.9%), Staphylococcus (6.9%) and Actinomyces (6.9%). Other genera commonly isolated include Bifidobacterium, Aerococcus, Gardnerellaand Actinobaculum, which comprise the resident female urinary microbiota.[11]

Metagenentics

The whole genome sequencing can be performed as a form of next generation sequencing (NGS), DNA NGS is generally performed using polymerase chain reaction amplification and 16S rRNA gene high-throughput sequencing, which allows the entire genome to be sequenced. Limitations of NSG are - 1. expensive 2. not widely available 3. inability to distinguish closely related bacterial taxa, confirm bacterial viability, and link the genotypic resistance to a specific organism.[12,13]

Ideal technique to collect urine sample Transurethral catheterisation is considered an optimal technique to collect urine as it lowers contamination of clean catch voided sample, and is less invasive than the suprapubic technique of urine sample collection[8]

Impact of urine microbiome in Bladder pain syndrome A recent review found that research regarding the impact of urinary microbiome on interstitial cystitis/ BPS and lower urinary tract function is in the preliminary stages, with four out of five studies finding no association between the urinary microbiota and IC/BPS. Evidence on the role of lactobacilli on bladder homeostasis are inconclusive, and need further research. In patients with IC/BPS, it is found that lactobacilli urotype is present in mainly premenopausal age and absent in the postmenopausal age.[13]

Testing for IC/BPS is unfortunately extremely limited because 16S NGS is unable to detect eukaryotic microbes, and EQUC cannot identify several types of fungi, resulting in many negative tests using the current diagnostic standards due to culture testing inconsistency.[14,15]

Our understanding of the urinary microbiome The urinary and vaginal microbiome are related and most likely to influence each other. The urinary microbiome has a low biomass. Similar strains of uropathogens are found in the urine and the vagina of females. The presence of healthy microbiome is associated with lower use of anti - cholinergic in women with LUTS and presence of certain bacteria such as Lactobacillus crispatus is associated with absence of LUTS, owing to the healthy bladder.

Current research shows that the microbiome of the bladder does not impact on IC/BPS.[16]

Antibiotic therapy affects the inherent urinary microbiome. Dietary and lifestyle changes influence the microbiome.

Conclusion

Further research is warranted in understanding the urinary microbiome in Indian subcontinent, as our lifestyle and dietary habits are different from the western counterpart.

The upcoming research on the microbiome and the use of probiotics is exciting. With WHO declaring antimicrobial resistance(AMR) as a global threat, the commonest indication to use antibiotics is a UTI. The understanding of urinary microbiome may help to decrease the burden of AMR.

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LATEST ANNOUNCEMENT

18th HUNA [Ho Chi Minh City Association of Urology-Nephrology]

GIBS - HUNA Symposium on IC/BPS

Date : 8th January 2022

Time : 13:35-15:05 Vietnamese Time / 12:00-13:30 IST

Watch us live on : live.huna18.com
ID:huna18@gmail.com Password : huna2021

Hall No. 2

Theme: Everything about Bladder on Fire

SCIENTIFIC PROGRAM

13:35 - 15:05	**Phiên TIẾT NIỆU 10B: Everything about Bladder on Fire - GIBS HUNA Symposium on IC/BPS** **CHỦ TỌA:** *Assoc/Prof. Vu Le Chuyen, Dr. Rajesh Taneja (Introduction to the topic by Dr. Rajesh Taneja)*
13:35 - 13:50 (15')	1. The attitudes of Gynecologist about overactive bladder *Dr. Nguyen Ba My Nhi*
13:50 - 14:05 (15')	2. Clinical diagnosis of BPS/IC *Dr. Sanjay Pandey*
14:05 - 14:20 (15')	3. The role of traditional medicine in managing Chronic Pelvic Pain *Assoc/Prof. Nguyen Thi Bay*
14:20 - 14:35 (15')	4. Treatment of BPS/IC *Dr. Shivam Priyadarshi*
14:35 - 14:50 (15')	5. Acupuncture for the Treatment of Interstitial Cystitis Symptoms *Dr. Nguyen Van Dan*
14:50 - 15:05	6. Discussions & Closing Remarks *Assoc/Prof. Vu Le Chuyen*

Announcing

GIBS 2022

7th Annual Conference [Virtual] on IC/BPS

Theme

'Save a Bladder - Save a Family'

Date

27th & 28th August 2022

Registrations Will Open Soon

Kindly send us your query in advance
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GIBS ON THE GO

LIVE WEBINAR

Highlights of the Year 2021

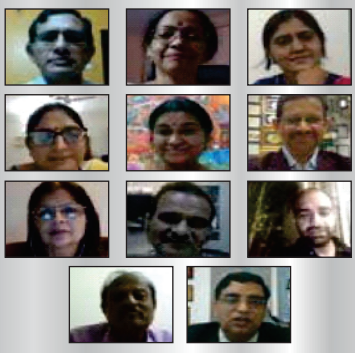
GIBS has successfully conducted WEBINAR on IC/BPS with

Jawaharlal Institute of Postgraduate Medical Education & Research (GIBS – Pondy)

January 16th 2021

Theme : Pelivc Pain An Enigma

Participant : 220 Plus

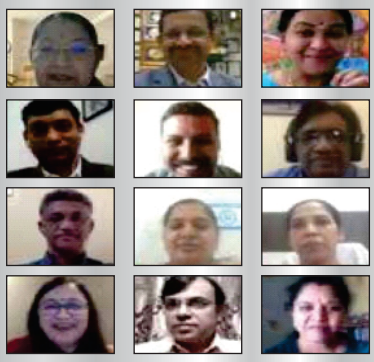


Obstetrician & Gynecology Society of Salem [OGSOS] (GIBS – Salem)

January 24th 2021

Topic : Bladder Pain A Conundrum

Participant : 170 Plus

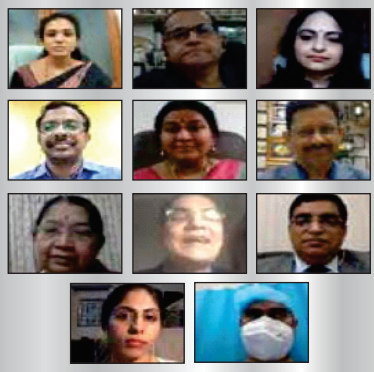


Trichy Obstertric and Gynaecological Society (TRIOGS) & Trichy Chapter of Urology Society of India & Urogynae Committee of FOGSI (GIBS-Trichy)

November 27th 2021

Topic : The Bladder Pain Tria How to Conquer

Participant : 250 Plus



Menopause Society Vadodara GIBS- Vadodara

March 13rd 2021

THEME: "Bladder Pain A Conundrum"

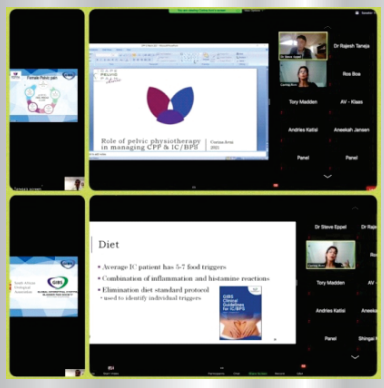
Participant : 380 Plus

Inaugural Symposium on CPPS/Interstitial Cystitis by the South African Urology Association

March 20th & 21rd 2021

In association with the GIBS

Participant : 250 Plus



Urogynecology Pelvic Floor Dysfunction & Incontinence Association (UPIA) on "AN UPDATE ON UTI"

April 22nd 2021

Topic : "Candida Auris Urinary Tract Infections and Possible Treatment"

GIBS International IC/BPS Patient Day

March 7th 2021

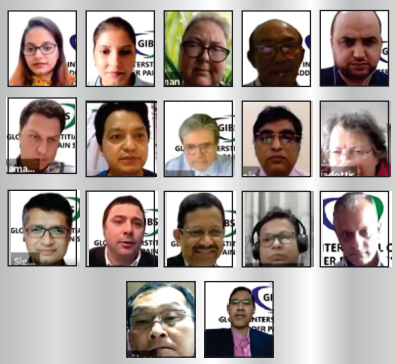
GIBS celebrated the very first - International IC/BPS Patient Day

GLOBAL ROUND TABLE

May 26th 2021

Theme

Urologists Forum on IC/BPS



Kurdistan Urological Association [KUA] & Iraqi Urology Association [IUA] GIBS – Kurdistan – Iraq 2021

December 3rd 2021

THEME: Fire in Bladder – The little known Interstitial Cystitis

Participants: 100Plus

GLOBAL INTERSTITIAL CYSTITIS, BLADDER PAIN SOCIETY

VIRTUAL GIBS 2021

An Educational Initiative – Supported by

SWATI SPENTOSE

6th Annual Meeting [Virtual] on Interstitial Cystitis / Bladder Pain Syndrome

EDUCATE, IDENTIFY & TREAT

28th & 29th Aug. 2021

REPORT

"Let's trouble the Trouble before the Trouble troubles us... Anymore!"

It is immense pleasure to state that **GIBS 2021 is a grand success** through virtual with its
"Theme: Educate, Identify & Treat"

The aim of the GIBS is to disseminate the knowledge of IC to spread awareness about the science behind it. A short video on GIBS milestones was discussed. All these years, it took us great hard work and dedication to reach the place where we are today. As it is rightly said, "Nothing comes easy; it takes dedication and hard work".

The meeting's major highlights were diagnosis, treatment, management, diet, and disease scoring system for IC/BPS. For ages, many have been troubled by this condition of IC/BPS and it's time now to get over it for a good quality of life which hadn't been successfully done till now.

This year's meeting received over 400 registrations from 37 countries all over the globe.

The journey has peeked! GIBS is determined to disseminate the evolving science of IC/BPS in all the seven continents, hopefully by the end of next year, to reach out to all those patients suffering from this disease and their physicians.

The planning for the further GIBS events & the 7th GIBS (2022) Annual Conference has already started coining the theme: ***"Save a Bladder – Save a Family!"***

Information about the other details would follow through emails, as the program evolves through the various planning stages. Looking forward to another exciting year full of educational activities on the subject of IC/BPS.

Stay Safe!!! Stay Healthy!!!