



**Dedicated Issue:**  
**"Urogynaecology"**



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<sup>#</sup> Mirza F, et al. Dydrogesterone use in early pregnancy. Gynecol Endocrinol. 2016;32(2):97-106. <sup>†</sup> Schindler AE. Progestational effects of dydrogesterone in vitro, in vivo and on human endometrium. Maturitas. 2009;65(1):S3-S11.  
<sup>~</sup> Novel-Estradiol hemihydrate first time in India. <sup>+</sup> Safer-As compared to conjugated equine estrogens. Smith NL et al Lower risk of cardiovascular events in postmenopausal women taking oral estradiol compared with oral conjugated equine estrogens. JAMA Intern Med. 2014; 174(1):25-31. <sup>\*</sup> As Prescribing Information of Solfe, version 1; Dated: 25th July 2013

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## Foreword



It gives me great pleasure to write the foreword for this month's issue. With number of COVID cases rising and falling, we have made our peace with going forward with the ongoing COVID waves with only focus on learning and becoming a little bit better than yesterday. AOGD as an organization has evolved so quickly over time keeping in pace with the need of the hour. The array of online webinars, CMEs, virtual meets and the latest interacting feature of online quiz with monthly meets keeps the audience engaged the entire month and an updated source of information to keep on revisiting the old and the new advances. The AOGD bulletins serve as powerhouse of information needed on every topic with new topics being touched every month.

The current bulletin is also formulated following the theme of year 2021-2022, "**Promoting Women's Health by Strong Will and Quality Skill**". This bulletin is touching the important untouched topics of Urogynaecology.

**Urogynaecology** has forever been a part of gynaecological practice and slowly and steadily being recognised as a gynaecological speciality. Despite being associated with gynaecology for quite a long time, it still is an enigma for many with doubtful areas in basics of anatomy and physiology along with management of common complaints encountered in gynaecological out patient department. This bulletin highlights important topics pertaining to urogynaecology with basics, evaluation as well as management of controversial topics along with recent advances in the field. Untouched topic like sexual dysfunction in women has also been brought to light with the motto of promoting women's health. I feel extremely honoured to be presenting to you a bulletin with much needed understanding hoping it will be appreciated by our learning residents as well as faculty alike.

Last but not the least, I congratulate the committee members and editorial board for the amazing work they are doing and wish them all the best for the time ahead.

A handwritten signature in black ink, reading "Dr. Neera Agarwal".

**Dr Neera Agarwal**  
Advisor, AOGD



## From the President's Pen



Greetings to all!

Teachers are the guiding lamps, who show us the right path and enlighten us with worldly knowledge. We started this month with the celebration of Teacher's day. 5<sup>th</sup> September is celebrated as teacher's day as it embarks the birth anniversary of Dr Sarvepalli Radhakrishnan, who was an Indian philosopher and the second President of India. I would like to extend my gratitude to every teacher for their dynamic support and motivating us to bring about positive change in the society. We will forever be grateful to them.

We have put together very interesting and informative topics for the upcoming **Annual AOGD Conference** to be held on 19<sup>th</sup> -21<sup>st</sup> November 2021. All of you must attend it to make it successful.

Urogynecology is one of the most evolving Sub-specialty branches of Obstetrics & Gynaecology and in this bulletin dedicated to "**Urogynaecology**" all the contributors have done a great job. Hope all AOGDians are empowered by reading this and it helps them in increasing their knowledge and practice in Urogynaecology.

***"Teaching is more than imparting knowledge; it is inspiring change. Learning is more than absorbing facts; it is acquiring understanding."***- William Arthur Ward

**Dr Achla Batra**

President, AOGD (2021-2022)

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## From the Vice-President's Pen



Dear Friends

Warm Greetings to all our dear AOGD Members!

The most awaited academic event for all of us in Delhi is just around the corner. The Annual AOGD Conference from 19-21 November 2021 and the pre Conference and post Conference events are going to take Academics to a new height. We hope that all of you will actively participate in all these activities. Please do submit your valuable research for competition and free papers in time and encourage your Post Graduate Students to take

part in the Quiz.

This issue brings for all of you a very important albeit neglected topic, which is issues related to Urogynaecology. We are all familiar with the silent suffering of our patient be it due to leaking of urine or utero-vaginal prolapse or even sexual dysfunctions, which though not life threatening, but make the quality of life for her so poor. This issue has dealt with many such important issues through the experience of stalwarts in the field, for the benefit of all our members. Hope you all will find it useful in your daily practice.

Requesting you all do attend the monthly AOGD Meeting and take part in the Quiz based exclusively on this issue.

Happy Reading and Best Wishes

**Dr Jyotsna Suri**

Vice President, AOGD (2021-2022)

### Starting Soon

Hands-on Practical Workshop (3 hours)  
on **"Obstetrics Critical Care"** from October 2021.

Interested candidates to contact

**Ms Sarita**, AOGD Office: Mobile No- 9211656757

## From the Secretary's Desk



Warm greetings to all !

Amidst the wonderful rainy season when our Delhi has witnessed the record rainfall in past many-many years, we continue in our endeavours to work towards our motto this year '**Strong Will and Quality Skills- For Woman's Health**'. We have collaborated with various national and state level organisations to bring out the best of programs for our members and masses serving both academic and social purpose.

We have geared up for the preparation of our **43<sup>rd</sup> Annual AOGD Conference** from **19<sup>th</sup>-21<sup>st</sup> November**. We request all our members to participate in this academic bonanza which will be filled with wonderful thought provoking scientific sessions presented by state, national and international faculty, topic dedicated pre- and post-conference workshops, scientific paper and poster presentations, quiz competition for our YUVA members and also a unique talent-hunt competition open to all our AOGD members. We have worked out a simple online registration and abstract submission portal. Also, we have eased out the facility to become AOGD member online itself, from the convenience of your home. So, please make the most of these facilities and be part of all academics and fun during this most awaited annual event.

As regards this month's bulletin, I congratulate the editorial team for yet another interesting and useful issue on "**Urogynaecology**". It aptly covers all the important aspects viz. applied anatomy and physiological basis of continence, evaluation of pelvic floor dysfunction, advances in management of pelvic organ prolapse, stress urinary Incontinence, recurrent UTI, bladder pain syndrome and sexual dysfunction in women. I am sure these evidence based articles with practical tips and recent advances in field of urogynaecology will be thoroughly useful for our readers.

Happy reading,

**Dr Monika Gupta**  
Secretary, AOGD (2021-2022)

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## From the Editor's Desk



Greetings from the editorial board!

Welcome to the 5<sup>th</sup> issue of AOGD bulletin. We are grateful to AOGD Advisor, Dr Neera Aggarwal for sparing her precious time to write foreword for the September issue of AOGD bulletin.

This issue has been Co-edited by **Dr Karishma Thariani**, one of our beloved Safdarjung Hospital alumnae. After pursuing post graduation and senior residency from VMMC & Safdarjung Hospital she did fellowship in Urogynaecology and Pelvic Reconstructive Surgery from AIIMS, Delhi and is currently Consultant, Urogynecology and Pelvic reconstructive surgery at Center for Urogynecology and Pelvic Health, New Delhi.

**Urogynaecology** is a sub-specialty that deals with Female Pelvic floor dysfunction. Gynaecologists are the first contacts of the women presenting with urogenital symptoms and play a vital role in the preliminary diagnosis and management of these conditions.

The knowledge of **Anatomy and Physiological Basis of Continence** is important to understand the pathophysiology of urogenital conditions. Systematic and detailed **Evaluation of Pelvic Floor Dysfunction** is crucial for planning appropriate treatment strategy. **Recent Advances in Management of Pelvic Organ Prolapse** has improved the patient satisfaction to a great extent. All women with **Stress Urinary incontinence** do not need surgery and can be managed by medical treatment. Management of **Recurrent Urinary Tract Infections** and **Bladder Pain Syndrome** can be challenging for the treating physicians and distressing for both patients and Gynaecologists. **Sexual Dysfunction in Women** can affect quality of life of a woman but this area has not received due importance in India. In this bulletin we have tried to cover these basic topics of Urogynaecology to assist the readers in managing the common pelvic floor dysfunctions.

Wish you all a happy learning!

**Dr Rekha Bharti**

Editor, AOGD (2021-2022)  
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# Anatomy and Physiology of Urinary Incontinence

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## Introduction

The basic function of lower urinary tract (LUT) is to store and empty urine in a coordinated manner. This depends on the activity of two functional units of the lower urinary tract: (1) a reservoir (the urinary bladder) and (2) an outlet consisting of the bladder neck, urethra, urethral sphincter, pelvic floor muscles and connective tissue. The coordination between these two basic functional units is orchestrated by the neuronal pathways located in the brain, spinal cord and peripheral ganglia. This high dependence of the LUT on neurological system sets it apart from other visceral systems. To get a better understanding of its function it is important to understand the anatomic and physiological basis of each of these components separately.

## Bladder

The bladder is a hollow organ with a wall made of bundles of smooth muscle. It is lined by transitional epithelium. The epithelium lining the bladder lumen is loosely attached to the underlying musculature, except at the trigone, where it is firmly adherent. The bladder lining consists of a transitional epithelium (urothelium) supported by a layer of loose connective tissue, the lamina propria. The bladder wall musculature is often described as having three layers: inner longitudinal, middle circular, and outer longitudinal. However, this layering occurs mainly at the bladder neck; the remainder of the bladder musculature is composed of fibers that run in many directions within and between layers. This plexiform arrangement of detrusor muscle bundles is ideally suited to produce a uniform reduction of the bladder lumen on contraction. The inner longitudinal layer has widely separated muscle fibers that course multidirectionally. Near the bladder neck, these muscle fibers assume a longitudinal pattern that is continuous through the trigone and into the inner longitudinal muscular layer of the urethra. The middle circular layer is prominent at the bladder neck, where it fuses with the deep trigonal muscle, forming a muscular ring. The outer longitudinal layer forms a sheet of muscle bundles around the bladder wall above the level of the bladder neck. Anteriorly, these fibers continue past the vesical neck as the pubovesical muscles and insert into tissues on the posterior surface of the pubic symphysis.

## Urethra

The female urethra is approximately 4 cm long and averages 6 mm in diameter. The urethral epithelium has longitudinal folds and many small glands, which open into the urethra throughout its entire length. These epithelial folds and secretions from the glands help in maintaining coaptation of the urethral lumen, hence helping in continence.

The epithelium is supported by a layer of loose fibroelastic connective tissue, the lamina propria. This layer has numerous small veins. This rich vascular supply contributes to urethral resistance. With advancing age and estrogen deficiency, there is an atrophy of this layer leading to increased incidence of incontinence.

The urethral smooth muscle is composed primarily of oblique and longitudinal muscle fibers, with a few circular outer fibers. This muscle and the detrusor muscle in the bladder base form what can be called the intrinsic urethral sphincter mechanism.

The striated urethral and periurethral muscles form the extrinsic urethral sphincter mechanism. It has two components:

- a. an inner portion, which lies within and adjacent to the urethral wall, and
- b. an outer portion, composed of skeletal muscle fibers of the pelvic diaphragm.

The inner portion is made up of the sphincter urethrae, a striated band of muscle that surrounds the proximal two thirds of the urethra, and the compressor urethrae and urethrovaginal sphincter (known together formerly as the deep transverse perineus muscle). These three muscles, which function as a single unit, have been the striated urogenital sphincter.

## Pelvic Floor and Connective Tissue

In addition to the structures of the lower urinary tract, the pelvic floor musculature and surrounding structures also contribute to urinary continence. The pelvic viscera, levator ani muscles and pelvic ligaments all act in concert to assist the sphincters in maintaining continence. The pubourethral ligaments are the fascial support of the midurethra to the inner

surface of the inferior pubis. This effectively stabilizes the urethra and anterior vaginal wall. Pubourethral ligament laxity is often attributed as a cause of stress incontinence, whereby there is rotational descent of the urethra and hence distraction with opening of the bladder neck/proximal urethra during times of stress such as coughing.

## Innervation of Lower Urinary Tract

### Afferent (Sensory) Pathways

Sensation of bladder filling and fullness arises from stretch receptors in the detrusor muscle as well as the urothelium and is conveyed via the parasympathetic afferent nerves to the sacral spinal cord. There, they enter ascending spinal pathways to the brain stem (the pontine micturition center) and cerebral cortex.

### Efferent (Motor) Pathways (Figure 1)

1. Parasympathetic efferents innervate the detrusor muscle. These nerves originate from the sacral spinal cord (S2–S4) and causes detrusor muscle contraction via muscarinic receptors.
2. Sympathetic efferents originate from T10 to L2 spinal segments and innervate smooth muscle of the bladder base, bladder neck, and proximal urethra. Some fibers have an inhibitory function during bladder filling by causing relaxation of the detrusor via beta-3 adrenergic receptors.
3. The somatic system consists of the pudendal and pelvic nerves which originate at cord segments S2–S4 (Onuf's nucleus) and innervate the urethral sphincter.

### Pontine Micturition Center (PMC)

The PMC is located in the brain stem. It is responsible for coordinated micturition, at an appropriate time and place, by integrating afferent sensory feedback from the lower urinary tract and cortical input

	Detrusor	Urethral muscle	External sphincter
Symp (T10-L2)	Inhibit ( $\beta$ )	Stimul ( $\alpha$ )	---
Parasymp (S2-4)	Stimul	Inhibit	---
Somatic (S2-4)	---	---	Stimul

Fig 1: Efferent pathways

to assess the appropriateness of voiding under a particular circumstance. Once the situation is deemed appropriate, then simultaneous

detrusor contraction and sphincter relaxation would occur, leading to normal voiding.

## The Micturition Cycle

The micturition cycle consists of 2 phases: (Figure 2)

1. **Bladder filling/ storage phase:** when the bladder starts filling with urine, the stretch receptors in the bladder wall get activated. This generates afferent activity which is transmitted to the pontine micturition center by the ascending spinal pathways. Bladder has a unique property of compliance due to which even with increasing distension there is very little increase in pressure. During bladder filling, the pontine micturition center is under continuous inhibitory input from

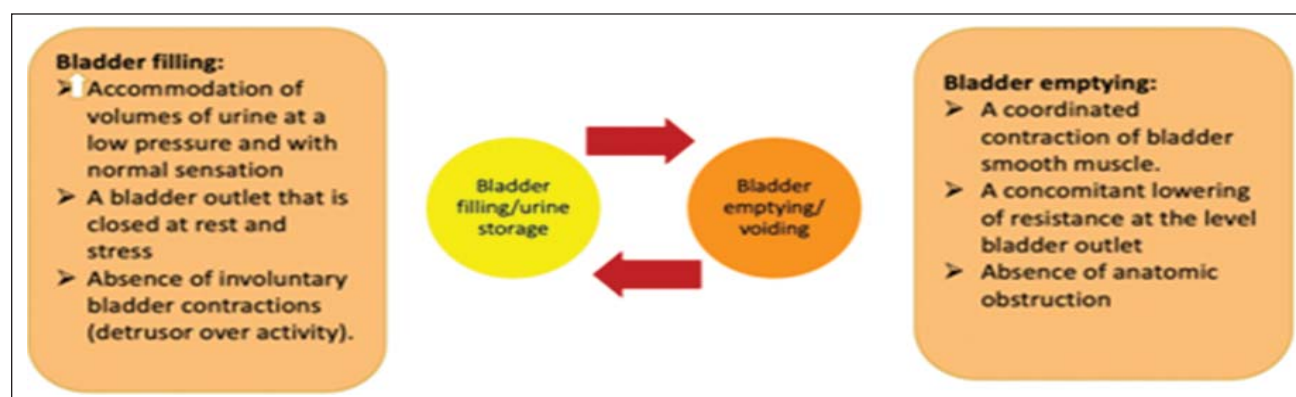
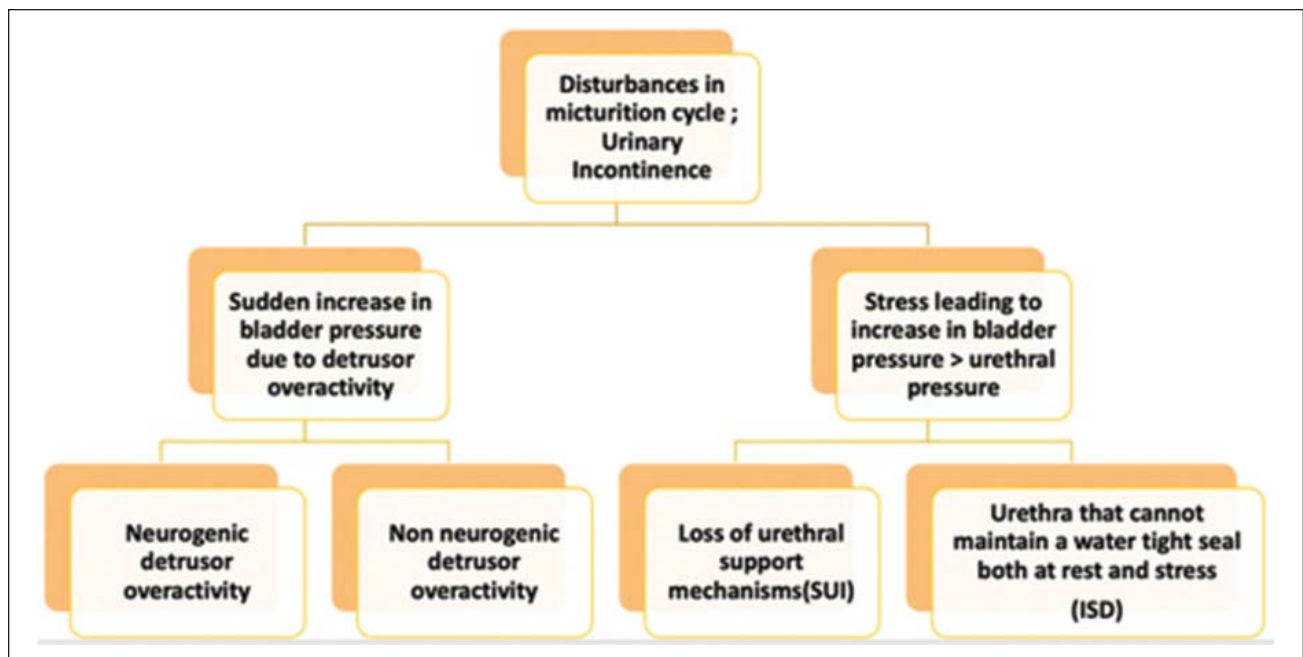


Fig 2: Micturition cycle



**Fig 3:** Pathophysiology of urinary incontinence

higher centers in the brain, especially the frontal cortex. When afferent activity to the pontine micturition center reaches threshold level and sensation of bladder fullness is appreciated, voiding can be initiated. If an appropriate time and place is available, the frontal cortex inhibition to the pons is lifted, and voiding can begin.

2. **Bladder emptying/ voiding phase:** At the time of voiding, the efferent activity is mediated via descending spinal pathways to the sacral spinal cord and the pelvic parasympathetic nerves. Acetylcholine (Ach) is released by these nerve terminals which bind to muscarinic receptors on the detrusor muscle to cause a detrusor contraction. At the same time, there is synchronous relaxation of the urethral sphincter mechanism again coordinated from the pontine micturition center to allow unobstructed voiding until the bladder is empty

## Pathophysiology of Urinary Incontinence

Urinary incontinence can occur due to abnormalities of storage function of the bladder (often due to overactive bladder) or abnormalities/deficiency in the function of the urethral sphincter mechanism. In many patients, both storage and sphincter abnormalities can coexist. (Figure 3)

## Suggested Reading

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2. DeLancey JOL. Anatomy. In: Cardozo L, Staskin D, eds. Textbook of Female Urology and Urogynecology. 3rd ed London, UK: Informa Healthcare; 2010.
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# Evaluation of a Woman with Pelvic Floor Dysfunction

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Pelvic floor dysfunction is a very common but underreported problem by women due to embarrassment and social inhibition. Women hesitate to consult the urogynaecologist /healthcare specialist as they consider this dysfunction as part of growing old and not having any treatment. The morbidity suffered by women is therefore tremendous. We shall discuss evaluation of women with pelvic organ prolapse and urinary incontinence in this chapter.

## Pelvic Organ Prolapse in Women

**Clinical evaluation:** this involves a thorough history and examination of the patient. The history should involve asking the patient about risk factors such as parity, weight gain, conditions involving an increase in abdominal pressure or genetic conditions. Also, the patient should be asked in detail about the symptoms related to prolapse. Detailed history involving complaints related to all the three compartments is of vital importance in patients with pelvic organ prolapse because treatment is decided on the basis of the symptoms. Patients with POP may present with symptoms related specifically to the prolapsed structures, such as a bulge or vaginal pressure or with associated symptoms including urinary, defecatory or sexual dysfunction<sup>1</sup>. Symptoms such as low back or pelvic pain have often been attributed to POP, but this association is not supported by well-designed studies<sup>2,3</sup>.

Severity of symptoms does not correlate well with the stage of prolapse<sup>4</sup>. Symptoms are often related to position; they are often less noticeable in the morning or while supine and worsen as the day progresses or women are active in an upright position.

Many women with prolapse are asymptomatic; treatment is generally not indicated in these women.

**Bulge or pressure symptoms** - In a study of 1912 women presenting to a pelvic floor disorder clinic, symptoms of "a bulge or that something is falling out of the vagina" had a sensitivity of 67 percent and a specificity of 87 percent for POP at or past

the hymen<sup>5</sup>. Although complaints of a bulge are associated with the presence of prolapse, it is only weakly correlated with prolapse stage, and does not predict site of prolapse<sup>6</sup>.

## Urinary Symptoms

Symptoms of stress urinary incontinence (SUI) often coexist with stage I or II prolapse<sup>7</sup>.

As prolapse advances, women may experience improvement in SUI, but increased difficulty voiding occurs when there is advanced anterior or apical prolapse, as the prolapse may "kink" the urethra.

**Defecatory symptoms** - Defecatory dysfunction i.e constipation and incomplete emptying affects 20 percent of women in the general population and 24 to 52 percent of those with POP<sup>8</sup>. Other defecatory symptoms include fecal urgency, fecal incontinence (accidental bowel leakage), and obstructive symptoms [eg, straining, or the need to apply digital pressure to the vagina or perineum (splint) to completely evacuate]; some women report fecal incontinence during sexual intercourse<sup>9</sup>.

**Effects on sexual function** some women avoided sexual activity because of fear of discomfort or embarrassment associated with POP, particularly those with urinary or fecal incontinence during sexual activity.

## Approach to the Examination

**Patient positioning** - The examination is performed in each position with the woman relaxed and then straining (to demonstrate the maximum degree of prolapse) -dorsal lithotomy, squatting and standing with legs apart with one foot on a well supported foot stool.

**Visual Inspection** - performed initially in dorsal lithotomy position with the patient relaxed and then while straining.

- Transverse diameter of the genital hiatus (eg, the space between the labia majora)
- Protrusion of the vaginal walls or cervix to or beyond the introitus (uterine procidentia)



- Length and condition of the perineum
- Rectal prolapse

In patients with prolapse to or beyond the hymen, examine vaginal tissue for ulceration.

Other findings (e.g., skin or mucosal lesions) should be noted and evaluated appropriately.

## Speculum and Bimanual Examination

Evaluation of prolapsed of each anatomic compartment is as follows with patient straining maximally:

- **Apical prolapse (prolapse of the cervix or vaginal vault)** - A bivalve speculum is inserted into the vagina and then slowly withdrawn; any descent of the apex is noted.
- **Anterior vaginal wall** - A Sims retractor or the posterior blade of a bivalve speculum is inserted into the vagina with gentle pressure on the posterior vaginal wall to isolate visualization of the anterior vaginal wall.
- **Posterior vaginal wall** - A Sims retractor or the posterior blade of a bivalve speculum into the vagina with gentle pressure on the anterior vaginal wall to isolate visualization of the posterior vaginal wall. If the posterior blade of a bivalve speculum is used, the device is rotated 180 degrees and used to elevate the anterior vaginal wall.

The terms anterior vaginal wall prolapse, posterior vaginal wall prolapse and apical prolapse are preferred to the terms "cystocele," "rectocele," and "enterocele" because vaginal topography does not reliably predict the location of the associated viscera in women with POP.

Bimanual examination is done to rule out any pelvic abnormalities.

**Using the POP-Q system** - the topography of the vagina is described using six points (two on the anterior vaginal wall, two on the superior vagina, and two on the posterior vaginal wall) and several other measurements<sup>10</sup>. These measurements are used to produce a sagittal diagram of the prolapse.

The maximal point of prolapse of each of the six points is recorded in relation to a fixed point of reference, the anterior-posterior plane of the hymen.

The measurements are marked on line diagrams, noted on a grid, or recorded in text form. The 6 points are given in the table below. They are then classified into stages (0-IV)

**Table:** Pelvic organ prolapse quantification system

Point	Description
Anterior wall (Aa)	Position of a point on the anterior vaginal wall in midline is 3 cm above external urethral meatus corresponding to the suburethral sulcus. Normal position at -3 cm and range is -3 cm to +3 cm.
Anterior wall (Ba)	Position of most distal point on upper anterior vaginal wall in midline. Normal position at -3 cm, range is -3 cm to a positive value depending on the degree of prolapse of anterior vaginal wall.
Posterior wall (Ap)	Position of a point on the posterior vaginal wall in midline 3 cm above hymen, normal position at -3 cm and range is -3 cm to +3 cm.
Posterior wall (Bp)	Position of a most distal point on upper posterior vaginal wall in midline. Normal position at -3 cm, range is -3 cm to a positive value depending on the degree of prolapse of posterior vaginal wall.
Cervix or cuff (C)	It is the apical point or the distal most point on the cervix or vaginal vault after hysterectomy.
Posterior fornix (D)	It is a point corresponding to the posterior vaginal fornix in women with a cervix, however this point is nonexistent in hysterectomized women.

## Rectovaginal Examination

Performed to:

- Diagnose an enterocele (patient in standing position; the small bowel can be palpated in the cul-de-sac between thumb and forefinger)
- Differentiate between a high rectocele and an enterocele
- Assess the integrity of the perineal body
- Detect rectal prolapse

## Neuromuscular Examination

**Neurologic evaluation** - Gross neurologic assessment of the vulva and perineum is performed to screen for neurologic disease.

Sensory of the lumbosacral dermatomes for light touch and sharp touch is performed using a small cotton swab and a sharp point<sup>11</sup>. If sensory function is abnormal, more detailed neurologic testing may be warranted.

Sacral reflexes are assessed to evaluate for sacral nerve integrity, the bulbocavernosus reflex is elicited by gently tapping or squeezing the clitoris. The anocutaneous reflex (anal wink sign) is triggered by

stroking the skin immediately surrounding the anus and observing a reflexive contraction of the external anal sphincter( should be elicited bilaterally).

Sacral nerve route motor function is evaluated by having the patient move the lower extremity.

If abnormal findings are encountered, the patient should be referred to a neurologist.

**Pelvic floor muscle testing** - Inspect pelvic floor musculature to evaluate integrity and symmetry and note the presence of scarring and whether pelvic floor contraction pulls the perineum inward.

Four conditions have been defined by International Continence Society:

- normal pelvic floor muscles -can voluntarily contract and relax
- overactive pelvic floor muscles - muscles which do not relax
- underactive pelvic floor muscles - cannot voluntarily contract
- nonfunctioning pelvic floor muscles - no pelvic floor muscle action palpable<sup>12</sup>.

## Ancillary Studies

Ancillary diagnostic procedures are performed for evaluation of bladder or bowel function. Infrequently, women will present with complaints of prolapse, yet on examination have evidence of excellent vaginal support as measured by the POP-Q. It is possible that these women have descent of the perineum or that they have an enterocele that descends between the vaginal and rectum or bladder and rectum without displacing the anterior or posterior vaginal walls.

Whether to proceed with ancillary testing depends upon the presenting symptoms and whether there are symptoms that do not correlate with physical examination findings (eg, bladder or bowel symptoms are present in the absence of prolapse).

**Perineal ultrasound** - can identify levator ani defects as well as prolapse of the bladder, rectum, and/or intestines into the vagina.

**Assessment of PVR** - A postvoid residual (PVR) urine volume is used to evaluate for urinary retention. Voiding trials to assess PVR can be either retrograde or spontaneous. There is no clear consensus on what is a normal or abnormal PVR urine volume. In general, a PVR of greater than 100 cc can be suggestive of voiding dysfunction or detrusor weakness; the range of normal values for PVR and

treatment options remains controversial<sup>13</sup>.

**Bowel function evaluation** - Women who are undergoing evaluation for POP may also require further evaluation of anal incontinence or obstructive symptoms (eg, constipation, incomplete emptying). Defecography can reveal an enterocele that was not detected on POP-Q.

## Urinary Incontinence

### Introduction

Urinary incontinence, the involuntary leakage of urine, is common and undertreated<sup>14</sup>. It is estimated that nearly 50 percent of adult women experience urinary incontinence, and only 25 to 61 percent of symptomatic community-dwelling women seek care<sup>15</sup>. Patients may be reluctant to initiate discussions about their incontinence and urinary symptoms due to embarrassment, lack of knowledge about treatment options, and/or fear of surgery.

### Evaluation

**History** - A detailed history is essential for the assessment of urinary incontinence and the type and severity of incontinence. As with any other symptom, the onset and duration of complaint is important. It is important to ask the patient if incontinence is associated with urgency to urinate or with sneezing, coughing or laughing. Other details about her day and night time frequency, voiding issues and drinking habits are also essential.

**Physical examination** - Not all women presenting with incontinence need a pelvic examination prior to initiating behavioral or medical therapy as long as the symptoms allow the clinician to differentiate between stress versus urgency incontinence, there is a low suspicion for urinary retention, and there is no systemic or other evidence of pelvic pathology.

Women with atypical symptoms, diagnostic uncertainty, or failure of initial treatment strategies should undergo pelvic examination to evaluate for pelvic floor muscle integrity, vaginal atrophy, pelvic masses, and advanced pelvic organ prolapse beyond the hymen.

A detailed neurologic examination is not necessary in the initial evaluation of all women with incontinence unless patients present with sudden onset of incontinence (especially urgency symptoms) or new onset of neurologic symptoms<sup>16</sup>. If there is concern for neurologic disease, we perform a limited evaluation of lower-extremity strength, reflexes,

and perineal sensation. As examples, weakness with hyperreflexia of the lower extremity may suggest an upper motor neuron lesion; absent perineal sensation with decreased rectal tone is concerning for cauda equina syndrome.

**Laboratory tests** - A urinalysis should be performed for all patients, and urine culture performed if a UTI or hematuria is suggested on screening.

We do not routinely check renal function unless there is concern for severe urinary retention resulting in hydronephrosis<sup>17</sup>.

## Clinical Tests

- **Cough stress test** - is performed to confirm the diagnosis of SUI. This test is performed with the patient in the standing position with a comfortably full bladder. While the examiner visualizes the urethra by separating the labia, the patient is asked to Valsalva and/or cough vigorously. The clinician observes directly whether or not there is leakage from the urethra<sup>18</sup>.
- **Post-void residual** - measuring the PVR can be helpful when diagnosis is uncertain, initial therapy is ineffective, or in patients where there is concern for urinary retention and/or overflow incontinence. In general, a PVR of less than one-third of total voided volume is considered adequate emptying. We use a PVR of >150 mL or >1/3 total volume as a cut of point for further evaluation of voiding dysfunction or PVR under 50 mL as normal and a PVR greater than 200 mL as abnormal [19].
- **Urodynamic testing** - Urodynamic testing is invasive, costly, and not necessary prior to initiating therapy. However, in women with suspected overflow incontinence (eg, underlying neurologic conditions, history of diabetes, or by symptom history), urodynamic testing may be indicated for further evaluation.

## Specialist Referral

Indications for referral include the presence of:

- Associated abdominal or pelvic pain in the absence of UTI
- Culture-proven recurrent UTIs (three or more per year or two in six months)
- Gross or microscopic hematuria with risk factors for malignancy in the absence of a UTI
- Lifelong incontinence or suspected vesicovaginal fistula or urethral diverticula on vaginal examination
- Other abnormal physical examination findings (eg, pelvic mass, pelvic organ prolapse beyond the hymen)
- New neurologic symptoms in addition to incontinence
- Uncertainty in diagnosis
- History of pelvic reconstructive surgery or pelvic irradiation
- Persistently elevated PVR volume, after treatment of possible causes (eg, medications, stool impaction)
- Suspected overflow incontinence, particularly in the setting of underlying conditions (eg, neurologic conditions, diabetes)
- Chronic urinary catheterization or difficulty passing a catheter

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# Recent Advances in Management of Pelvic Organ Prolapse

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Pelvic organ prolapse (POP) is defined as falling, slipping or downward displacement of the uterus and/or the different vaginal compartments and their neighbouring organs such as bladder, rectum or bowel.<sup>1</sup> It results in considerable distress to women and poor quality of life. The reported incidence is 41-50% in women over the age of 40. The chance of being operated for POP is 7-11% and it is estimated that with the increase in life expectancy the rate would increase. The success rate of POP surgery is 71-80% only; therefore there has been constant research ongoing to understand pathogenesis, functional anatomy and devise ideal management for POP.

**Functional Anatomy** - We are now moving from discussing empirically derived hypotheses based on gross anatomy and physical examination to testing mechanistic hypotheses by comparing the structure and function between living women with and without prolapse using MRI, ultrasound, and functional pelvic floor testing.

An up-to-date understanding of pelvic floor tissues reveals that development and progression of POP involves complex interaction of multiple systems. Recent findings based on imaging investigations is the basis of The 'Boat in a Dry Dock' concept of support of pelvic organs in which levator Ani and pelvic cellular fascia with its attachment to bony pelvis are given almost equal importance in support. Pelvic deficits in levator ani support can increase reliance on remaining supportive tissues that, in the presence of external forces, leads to cumulative strain and eventual failure over time.<sup>2</sup> Muscle failure

also exposes the vaginal wall to a pressure differential producing abnormal tension on the attachments of the pelvic organs to the pelvic sidewall. The primary difference in ligament properties between women with and without prolapse is found in ligament length. Only minor differences in ligament stiffness are seen.

Thus recent finding suggest that pelvic organ prolapse occurs because of injury to the levator ani muscles and failure of the lateral connections between the pelvic organs to the pelvic sidewall, Fig 1. Abnormalities of the vaginal wall fascial tissues may play a minor role.<sup>2</sup>

Delancey's integrated life span model depicts pelvic floor function over a woman's lifetime as a curve that peaks during growth, abruptly declines and potentially rebounds according to variations in injury and recovery surrounding childbirth, then declines at an individualized rate with age according to intervening factors.

**Evaluation** - Physical examination is used in most centers for the evaluation of POP. Radiologic studies are used to augment the physical examination, especially for enteroceles. Recent advances include attempts at standardizing the terminology for POP and using magnetic resonance imaging (MRI) in evaluation.

The POP-Q system has been criticized as being difficult to understand and not addressing all pelvic support defects. Paravaginal defects and relaxation of the proximal anterior or posterior walls are often missed by this system. Scotti et al have proposed the Revised New York Classification System (Fig. 2), in which the deficiencies of the POP-Q system are also addressed.<sup>4</sup> The right and left lateral walls along with the anterior, posterior and apical segments of the vagina are each separately evaluated by dividing them into three zones: the upper, middle and lower zone. Each zone is recorded subjectively as small, moderate, or large descent, as well as in relation to the ischial spines, urethrovesical junction, and hymen. Also included are perineal descent, Q-tip angle, and 'surgical conjugates' (distance between

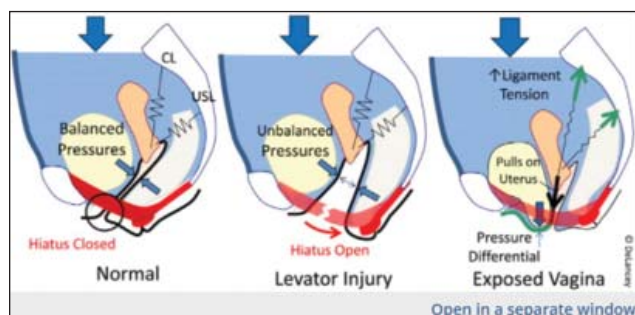
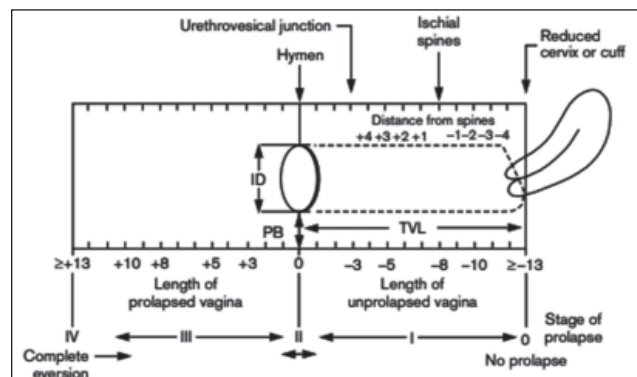


Fig 1: Levator ani muscles and lateral connections in POP



hymen and ischial spines, and distance between hymen and sacral promontory). Validity and reproducibility tests of this system are in progress.



**Fig 2:** Revised New York Classification System

ID- introital diameter; PB-perineal body; TVL- total vaginal length.

**Changing Principles of Surgical Management** - The earliest surgical attempts to relieve prolapse were relatively simple. These procedures included labial suturing and removing portions of the vaginal epithelium to reduce the calibre of the vagina. During the 20th century, advances in understanding and treatment of prolapse progressed at an ever increasing rate. Historically ineffective treatments of the presurgical era gave rise to the advanced surgical techniques. As surgical technology advanced, anatomically distorting surgeries were replaced by anatomically reconstructive procedures for the management of pelvic organ prolapse.

In this era of modern medicine the concepts of pelvic anatomy are better understood than they ever were before. Age old surgical procedures like various native tissue slings, Manchester- Fothergills repair and even vaginal hysterectomy for treatment of prolapse are now being challenged as newer anatomically appropriate procedures are being developed.

Visualization of the pelvic anatomy as a single, interdependent, three dimensional, functional unit itself has changed the principle of prolapse repair. The emphasis is now on restoring the functional anatomy rather hiding the prolapse by distorting the anatomy.

Issues like uterine preservation, maintaining the uterine axis and restoration of the affected fascial defects in an anatomically appropriate manner are given utmost importance. Use of mesh and other biological grafts for reconstructive surgery of pelvic organ prolapse are believed to bring

down reoperation rates. Use of minimally invasive approach in management has brought down operative time and post-operative pain. Another changing trend in reconstructive vaginal surgery is emphasis on maintaining the vaginal length and axis post operatively. This not only reduces dyspareunia but also helps in reducing recurrences.

## Minimally Invasive Surgery in Pelvic Organ Prolapse

In the past few years there has been a growing interest in the use of laparoscopic route to correct pelvic organ prolapse. The principles of the laparoscopic surgery are same as that of the corresponding open procedure. The laparoscopic route offers many advantages including excellent intraoperative visualization of the pelvic anatomy and retroperitoneal space, reduction in blood loss, decrease in post-operative pain and shorter hospital stay. The magnification provided by laparoscopy offers the advantage of visualization and dissection of fascial planes deep down in the pelvis which is almost impossible in open surgeries. This helps in restoration of anatomy in a way which was not possible previously.

### Laparoscopic Sacro Hysteropexy for Apical Compartment Prolapse

Sacro hysteropexy is a uterus conserving procedure where the uterus is suspended to the sacral promontory with the help of a synthetic mesh. Laparoscopic Sacro hysteropexy has been gaining popularity owing to its minimal access approach, better visualization of anatomy, reduced blood loss and earlier recovery. It also has the benefit of maintaining the vaginal length leading to better sexual function postoperatively. The procedure is important for young patients presenting with uterovaginal prolapse where further pregnancy may be a big issue. Also the mesh does not interfere with fetal development and blood supply. But due to risk of failure of procedure during vaginal delivery, patients who conceive after laparoscopic hysteropexy should be advised for elective caesarean section.

### Laparoscopic Sacrocolpopexy for Vault Prolapse

Vaginal vault prolapse has been estimated to occur in 0.2–43% of post-hysterectomy patients. Laparoscopic sacrocolpopexy has evolved from classical abdominal sacrocolpopexy. The visual magnification and ability to work with relative ease deep in the pelvis, that are provided by the

laparoscopic approach, have given pelvic-floor surgeons the opportunity to modify the original open procedure, by placing the mesh much lower over the posterior vaginal wall down to the level of pelvic floor (levator ani muscle) and perineal body, in an attempt to enhance its effectiveness. The mesh should be attached with minimal tension on the vagina. The success rate of laparoscopic sacrocolpopexy has been reported to be 90–96%, with a mesh erosion rate of 1–8%.

### ***Laparoscopic Anterior Wall Repair***

Anterior vaginal wall prolapse is the most common form of vaginal prolapse mostly aggravated by vaginal birth. Conventionally, cystocele repair is done vaginally and is called anterior colporrhaphy. It has an extremely variable success rate ranging from 36–100% in various studies. There is currently limited evidence to support the use of mesh and other graft materials for anterior repair.

The most common cause for an anterior prolapse is paravaginal defect or loss of support of lateral vagina. In patients with paravaginal defects, the most appropriate surgical procedure is the paravaginal repair. The laparoscopic paravaginal repair is accomplished by suturing the lateral aspect of the anterior vaginal wall back to its original point of attachment known as the arcus tendineus fascia pelvis (ATFP) or the “white line”. Reapproximation of the vaginal wall to the fascia overlying the obturator internus muscle will restore the bladder and the urethra to its normal anatomical position. Dissection till the white line may be difficult due to proper visualization in vaginal and open abdominal route.

### ***Laparoscopic Posterior Compartment Repair***

Vaginal posterior compartment prolapse repair is generally associated with good success rates and is preferred by most surgeons due to easy to learn technique and good results. The laparoscopic repair of high rectocele and enterocele, in women undergoing surgery for uterine or vault prolapse, is advocated to avoid a separate vaginal procedure. Several studies that looked at the extension of the mesh over the posterior vaginal wall down to the level of levator ani muscle and perineal body reported good anatomic and functional results prolapse. The laparoscopic approach of posterior compartment prolapse, with an extension of mesh over the posterior vaginal wall at the time of sacrocolpopexy, is an effective technique for repair of enterocele and high rectocele; however, further

evaluation of anatomical and functional outcomes is needed.

## **Robotics in Management of Pelvic Organ Prolapse**

Robotic surgery in urogynaecology has now made its place. The advantage of robot over laparoscopy is its superior 3D visualization, improved ergonomics and ease of suturing. High cost of instruments limits its widespread use.

## **Synthetic Mesh in Prolapse Surgery**

Use of synthetic mesh in management of uterovaginal prolapse came with a big bang a few years ago. Many mesh kits for anterior, posterior and apical compartments were launched by different companies each promising excellent short and long term outcomes. The rapid turnover of grafts/meshes and new surgical techniques made it difficult to properly evaluate the efficacy and safety of products, devices or actual surgeries. This was followed by increase in the number of reports and law suits for cases of mesh erosion and other mesh related complications. In 2008, the FDA released a Public Health Notification to inform clinicians and patients of adverse events related to the use of surgical mesh in pelvic organ prolapse.

In July 2011, the FDA issued an Update on the Safety and Effectiveness of Transvaginal Placement of Urogynecologic Mesh for Pelvic Organ Prolapse. This document raised alarm and stirred up debate and controversies about the use of mesh in pelvic organ surgery.

Subsequently, statements of the RANZCOG, and statements from the American College of Obstetricians and Gynaecologists (ACOG) and American Urogynecologic Society (AUGS), Medicine and Healthcare Products Regulatory Agency (MHRA) in the UK, have been made to reassure clinicians and patients that:

- a. For the vast majority of women, mesh and tape implants are a safe and effective operation, but as with all surgery, there is an element of risk
- b. There are different types of mesh for different purposes that have different outcomes
- c. There is not enough supporting evidence to justify taking mesh off the market.
- d. Pelvic organ prolapse vaginal mesh repair should be reserved for high-risk individuals

- e. Surgeons placing vaginal mesh should undergo training specific to each device and have experience with reconstructive surgical procedures and a thorough understanding of pelvic anatomy
- f. Patients should be informed about all treatment options, including the pros and cons of each option for pelvic organ prolapse

## Pelvic Floor Muscle Training

PFMT to improve muscle health during pregnancy may be helpful in reducing risk of LAD during delivery. These strategies may be more valuable in women identified to be at risk before pregnancy such as small pelvic diameter, small levator hiatus, age 40 years or older at first delivery. PFMT with or without biofeedback done correctly is emerging an important tool in improving pelvic floor dysfunctions because of better identification by imaging of the defects in fascia and Levator Ani.

## Conclusion

Our understanding of the pathophysiology of pelvic floor disorders is in transition. We are moving from discussing empirically derived hypotheses based

on gross anatomy and physical examination to testing mechanistic hypotheses by comparing the structure and function between living women with and without prolapse using MRI, ultrasound and functional pelvic floor testing. The surgeries for prolapse now emphasize on maintaining function and correcting the defect and not removing the uterus .

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# Stress Urinary Incontinence: Is Surgery the Only Answer?

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## Introduction

Stress urinary incontinence (SUI) has been defined by the International Continence Society (ICS) as any involuntary leakage of urine with activities which result in increased intra-abdominal pressure like coughing, sneezing, laughing, climbing stairs and sporting activities.<sup>1</sup> Prevalence of SUI varies markedly in different countries, being approximately 18% in India to 26.4% in USA.<sup>2,3</sup> These rates are predicted to increase in the coming years secondary to an aging population.

Factors predisposing to SUI are mainly increasing parity especially vaginal deliveries, obesity, menopause, chronic obstructive airway disease, smoking and family history. The diagnosis is made as per the Third International Consultation on Incontinence in 2005, by assessing symptoms (including frequency, volume chart and questionnaire), estimating quality of life and need for treatment, abdominal and pelvic examination, cough stress test to ascertain SUI, examining voluntary pelvic floor muscle contraction and evaluating post void residual urine.<sup>4</sup>

The factors necessary for the urethra to remain closed at rest and during increased abdominal pressure are: 1) healthy, functioning striated sphincter controlled by pudendal innervation, 2) well vascularised urethral mucosa and sub-mucosa, 3) properly aligned and functioning intrinsic urethral smooth muscle, and 4) intact vaginal wall support. According to Delancey's "hammock hypothesis" the posterior position of the vagina provides a backboard against which increasing intra-abdominal forces compress the urethra. Any alteration in one or more components can lead to inability of urethra to counteract increases in abdominal pressure leading to SUI.

## Treatment modalities for SUI

Wide spectrum of options, both nonsurgical and surgical are available for treatment of symptomatic stress urinary incontinence and no single method is the 'best'.

Many factors should be considered when determining the optimal therapy for a patient with SUI. These

include the etiology and type of SUI, bladder capacity, renal function, sexual function, severity of the leakage and degree of bother to the patient, the presence of associated conditions such as vaginal prolapse or concurrent abdominal or pelvic pathology requiring surgical correction, prior abdominal and/or pelvic surgery, and finally, the patient's suitability for and willingness to accept the costs, risks, morbidity, and the success and the failure rates associated with each intervention. The decision to treat symptomatic SUI with surgery should be made when the patient's degree of inconvenience and/or compromised lifestyle are great enough to warrant an elective operation and nonsurgical therapy is either not desired or has been previously ineffective.

For most patients, it is better to start with lifestyle and behavioural therapy which is simplest, reversible, least invasive and least expensive.

## Lifestyle and Behavioural Therapy<sup>5</sup>

Dietary changes– avoidance of caffeine and alcohol  
Fluid restriction to approximately 1500 ml or 30ml/kg per 24 hours

Timed voiding to prevent the bladder from reaching its capacity

Medication adjustments for possible urinary side effects (diuretics)

Weight loss

Cessation of smoking

Postural changes such as crossing the legs during increased intra-abdominal pressure prevents the leakage

Obesity is a significant modifiable and reversible risk factor for SUI and has been hypothesized to promote urinary incontinence by increasing intraabdominal pressure leading to chronic stress on the pelvic floor. A reduction of 5-10% in the baseline weight resulted in an approximately 50% reduction in the frequency of incontinence.

## Pelvic Floor Muscle Training

Arnold Kegel first described pelvic floor exercises in 1948. PFMT is the first line treatment for and



is thought to utilize pelvic floor muscles in three distinct ways: by increasing urethral pressure, through support of the bladder neck, and by interacting with the transversus abdominis via coordinated contractions between the pelvic floor muscles and the transversus abdominis muscle.

In 2018, a Cochrane Systematic Review of PFMT versus no treatment, or inactive control treatments for UI was performed. The results confirm that women treated with PFMT were more likely than no PFMT groups to report improved or cured UI.<sup>6</sup> PFMT using manual, digital feedback instruction is usually given during one office visit. Although recommendations regarding the number of repetitions necessary for treatment vary widely, efficacy has been shown with 30 to 50 daily contractions.

## Bladder Training

It focuses on changing voiding habits to modify bladder function. There are typically three components to bladder training: patient education, scheduled voiding, and positive reinforcement. The aim of this technique is to have the patient void prior to UI. There is low quality evidence showing that bladder training improves UI compared to no active intervention.

## Vaginal Cones

Some patients find it difficult to do pelvic floor exercises or are just poorly compliant to the treatment. In such cases sets of graded weighted vaginal cones are useful. The cones provide progressive muscular overload. They are inserted into the vagina and the patient is instructed to maintain the heaviest cone possible within the vagina. Patients advance progressively to the use of heavier cones. This methodology is thought to allow for faster PFMT training, with perceived improvements that provide a motivational factor. A reasonable goal is to retain the cone for 20 minutes while walking.

In a Cochrane review in 2013, it was found that vaginal cones may be better than no active treatment and they may be a good conservative option as a method for PFMT.<sup>7</sup>

## Mechanical Devices

Mechanical devices like pessaries, sponge or tampon like vaginal insert are useful in the treatment of SUI by providing urethral support. A recent Cochrane

review in 2014 concluded that there was little to judge whether the use of mechanical devices are superior to no treatment. Furthermore, there was insufficient evidence to support one device over another and little evidence to compare mechanical devices with other forms of treatment.

Urethral plugs passively occlude and/or coapt the urethra, and are to be removed before voiding. Although urethral inserts are potentially applicable to almost all women with pure SUI, the fact that these devices must be removed and reinserted with each void is not attractive to most women. The highest patient acceptance seems to be among those with very predictable, episodic SUI, such as during sports or dancing. Many of these patients believe that their problem is too mild to undergo a surgical procedure but are happy to have this minimally invasive alternative.

## Pharmacologic Therapy

Pharmacological therapy has been used with varying success rates. The following drugs are being used:

1. Duloxetine: Duloxetine is a selective serotonin/norepinephrine reuptake inhibitor (SNRI). There is a weak inhibition of dopamine and no significant affinity for histaminergic, dopaminergic, cholinergic, and adrenergic receptors. The action of duloxetine in the treatment of stress urinary incontinence is associated with a reuptake inhibition of serotonin and norepinephrine at the presynaptic neuron in Onuf's nucleus of the sacral spinal cord which is the origin of pudendal nerve. Serotonin and norepinephrine stimulate the receptors 5HT<sub>2</sub> and  $\alpha$ -1 to increase activity of the pudendal nerve and cause contraction of the skeletal component of the urethral sphincter. Side effects associated with duloxetine were generally mild; the most frequently reported complaint was nausea (22.7%), followed by fatigue, dry mouth, and insomnia. Studies have shown a significant reduction in the Incontinence Episode Frequency (IEF) by approximately 50% during treatment by duloxetine and significantly better quality-of-life scores.<sup>8</sup>
2. Alpha adrenergic Agonist: Alpha adrenergic receptors are present in bladder neck and proximal urethra, and when stimulated produce smooth muscle contraction and an increase in maximal urethral pressure. But use of this group of drugs is often limited by the potential side-effects including blood pressure elevation, anxiety, insomnia, headache, tremor, weakness,



palpitations, cardiac arrhythmia and respiratory difficulties. These agents should be used with caution in patients with hypertension, cardiovascular disease, and hyperthyroidism. Pseudoephedrine, an alpha adrenergic agonist is the drug generally used in the dose of 60 mg QID or 120 mg BD with extended release form. Phenylpropanolamine (PPA) has similar potency, but with fewer central effects.

A Cochrane Systematic Review in 2019 suggested that alpha adrenergic drugs studied were better than placebo in reducing both objectives (eg. Pad changes, incontinent episodes) and subjective symptoms of female SUI.<sup>9</sup>

3. Imipramine: It is a tricyclic antidepressant and is thought to facilitate urine storage by decreasing bladder contractility and increasing outlet resistance. Mechanism of action: 1) Central and peripheral anticholinergic effects at some, but not all sites; 2) Blocks the active transport system in the presynaptic nerve ending, which is responsible for the reuptake of the released amine neurotransmitters norepinephrine and serotonin.
4. Estrogen: Estrogen receptors are present in the urethra and detrusor muscle, as well as the pubococcygeal muscle in the pelvic floor. Estrogen acts through following mechanisms in the lower urinary tract of postmenopausal females: 1) increasing the sensory threshold of the bladder and/or urethra, 2) raising the sensitivity of  $\alpha$ -adrenoceptors urethral smooth muscle and so increasing the urethral resistance and/or 3) correcting urogenital atrophy

Intravaginal estriol added to PFMT, electrical stimulation and biofeedback is a safe and efficacious first-line therapy in postmenopausal women with SUI.<sup>10</sup>

Surgery is mostly offered as the primary treatment option for moderate or severe SUI if conservative therapy fails. The various surgical modalities commonly performed are as follows: Burch colposuspension, autologous fascial pubovaginal sling (PVS), mid-urethral slings like Tension free

vaginal tape procedure and Transobturator tape procedure. Each procedure is associated with its own set of complications. So while giving treatment options to the patients, it is better to start with the simpler, non invasive conservative management which is usually effective in reducing about 50% of the symptoms in most of the patients.

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# Recurrent Urinary Tract Infections: How to manage?

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## Introduction

Urinary tract infections are the most common bacterial infections affecting women of all age groups. They are a common cause of morbidity and can lead to significant mortality. Although the urinary tract is normally free of bacterial growth, bacteria that ascend from the rectal reservoir may cause UTI.<sup>1</sup> When the bacterial virulence increases or the host defense reduces, bacterial inoculation, colonisation and infection of the urinary tract occurs. Infection of the urinary tract is a general term that can be applied to a spectrum of clinical conditions ranging from asymptomatic bacteriuria to life threatening pyelonephritis.<sup>2</sup>

## Recurrence vs Reinfection

After an initial UTI, 20-30% of women will get a second UTI within six months and 3% will experience a third UTI within that period.<sup>1</sup> **Recurrent UTI** is defined as two uncomplicated UTIs in six months or, more traditionally, as three positive cultures within the preceding twelve months.<sup>3</sup> It has been shown that 27% of women will have at least one culture proven recurrence within the first six months of the first episode. These recurrent episodes of UTI are a source of considerable distress to the patient, hence while evaluating these patients it is important to differentiate between a recurrent and an incompletely treated infection. The management of these two conditions is likely to differ.

A **re-infection** is defined as recurrent UTI caused by a different bacterial isolate, or by the previously isolated bacteria after a negative intervening culture or an adequate time period (2 weeks) between infections. These infections are generally associated with high host susceptibility. Whereas, an incompletely treated infection implies persistence of the bacteria in the urinary tract and is generally associated with anatomical or functional abnormality of the urinary tract.<sup>4</sup>

**Relapse** is recurrent infection with the same organism despite adequate therapy. Reinfection is

more common than relapse. Most recurrences occur within the first 3 months after the primary infection.

## Etiopathogenesis

Recurrent UTIs arise due to bacterial colonization of the urothelium, inflammation of the urinary tract and occasionally, dissemination of the bacteria.<sup>1</sup> The main causative pathogen involved in recurrent UTI in women is *E. coli* which accounts for 80% of all episodes of infection. Other significant pathogens include *Staphylococcus saprophyticus* (8%), *Klebsiella pneumoniae*, and *Proteus mirabilis*.<sup>2</sup> *Candida albicans* and *Mycobacterium tuberculosis* may cause infections in immunocompromised women. The pathogenesis involves complex host and microbial interactions.

## Host Factors

These are the natural defense mechanisms of the urinary tract and the vagina which help in preventing the colonization of the urinary tract by the bacteria. These defense mechanisms include:

- Vaginal colonization with lactobacilli, which prevent the growth and ascend of the pathogenic bacteria into the urinary tract by maintaining low vaginal pH. The growth of these lactobacilli is facilitated by estrogen. Hence, in postmenopausal women lack of estrogen leads to alteration of vaginal pH, leading to increased incidence of UTI after menopause.
- Unobstructed urine flow, leading to washout of bacteria from the lower urinary tract thereby preventing colonization. Therefore, women with voiding difficulties, urethral stenosis and incomplete bladder emptying are more prone to UTIs.
- Presence of Tamm-Horsfall's proteins, mucopolysaccharides and immunoglobulins in the urine act as a barrier to growth of bacteria in the bladder and reduce bacterial adherence.
- Women who are non-secretors of the blood group antigens have a four-fold higher genetic predisposition to UTIs.

- e. Risk factors for premenopausal women include increased frequency of sexual intercourse, new partners, use of spermicide/diaphragm which increase vaginal and urethral colonization with *E.coli*. Non-behavioral factors include, previous case of UTI before 15 yrs of age and shorter distance between urethra and anus.
  - f. Risk factors for menopausal women include estrogen deficiency, cystocele, urogenital surgery, high post-void residual volume, previous UTI, relative depletion of vaginal lactobacilli and increase of vaginal *E coli* compared with premenopausal women, functional status deterioration in elderly institutionalized women, urine catheterization.
- Number of previous UTI episodes, investigations and treatment
  - Lower or upper UTI symptoms
  - Urinary incontinence
  - Any association of symptoms with sexual intercourse
  - Sexual and contraceptive history
  - Past medical history: diabetes, neurological disease, any previous urolithiasis, previous surgeries, any urinary tract instrumentation
  - Any medications

The main **negative predictors** for recurrent UTI are

- Presence of nocturia
- Persistence of symptoms between episodes of treated infection

Examination should detail about:

- Signs of urogenital atrophy
- Pelvic organ prolapse
- Post void residual urine
- Neurological examination
- Renal size and tenderness

As regards investigations, urine analysis is gold standard for recurrent UTI is urine routine microscopy and culture of a mid-stream clean catch urine sample. This sample should ideally be processed as soon as possible. The microbiological criteria for diagnosing UTI are not arbitrary but based on a series of experiments that correlate UTI syndromes with the quantity of organisms in urine.<sup>3</sup> UTI is diagnosed if > 100,000 colony forming units (CFU)/ HPF are found on culture. In women with symptoms of a UTI > 1000 CFU/HPF is considered sufficient to document infection and >10,000 in patients with pyelonephritis. Urine sample should be recultured two weeks after initiating therapy for assessing bacterial persistence.

Other relevant investigation in patients of recurrent UTI is ultrasound KUB region to rule out post void residual urine, bladder/ renal calculi, or any other anatomic abnormality. Uncomplicated recurrent UTI does not require imaging. Cystoscopy is not recommended in all cases but may be done in patients with atypical symptoms, gross hematuria, persisting pain, renal insufficiency or history of abdominopelvic malignancy.<sup>1</sup> All such patients should be screened for diabetes as well.

## Microbial Factors

These factors are virulence factors of the bacteria which facilitate the colonization and growth of the bacteria in the urothelium. These may be divided into:

- a. Bacterial adherence mechanism: The most important adherence factors are thought to be fimbriae (pili), which mediate binding of bacteria to receptors on urothelial cells. Pathogenic *E. coli* possess two types of pili the type I or type P pili. Type P are the mannose resistant pili, the bacteria possessing them confer tropism to kidneys and are responsible for causing pyelonephritis.
- b. Direct virulence: these are the toxins produced by the bacteria which affect the mucosal surfaces. These may be endotoxins, exotoxins or hemolysins which promote bacterial invasion and tissue damage.
- c. Antibiotic resistance: the bacteria develop resistance to antibiotics by various mechanisms like developing efflux mechanisms or enzymes which degrade the antibiotics.

## Clinical Evaluation

UTIs result from inflammation of the urinary tract hence patients present with classic symptoms of dysuria, urinary frequency, urgency, suprapubic pain with or without hematuria. Women with recurrent UTI can very accurately self-diagnose on the basis of symptoms, with an 84% positive culture rate.

A focused history should be taken while evaluating such patients including:

- Age of first UTI

**Table 1:** Treatment regimens for acute episode of UTI

Circumstances	Route	Drug	Dose	Duration
Healthy woman	Oral	1. Nitrofurantoin 2. Fosfomycin 3. Pivmecillinam	100 mg BD 3gm Stat 400 mg BD	5 days Single dose 3-7 days
Age >65yrs, diabetes, recent UTI, symptoms >7 days	Oral	Trimethoprim-Sulphamethoxazole	1 DS tab BD	7 days
Pregnancy	Oral	Nitrofurantoin	100 mg BD	5 Days

## Treatment

Treatment of acute episode should be based on culture report. Table 1 gives details of anti-microbials which may be used in the acute phase. The aim of the treatment should be complete eradication of infection which should be confirmed by means of urine analysis post treatment.

## Prevention of Recurrences

Recurrent episodes may be prevented by

### Life Style Modifications

Conservative measures have been advocated for prevention of recurrences for a very long time. Although no good quality evidence exists to prove their benefit, they still may be offered to patients. Some of these include: Avoiding spermicidal jellies; Drinking plenty of water; Voiding frequently; Voiding after intercourse; Avoiding use of tight clothing; Avoid cosmetic bath products; Avoid vaginal douches.

### Local Estrogen Therapy

Vaginal estrogen may be an effective prophylactic measure in postmenopausal women with recurrent UTI. Side effects include breast tenderness, vaginal bleeding or spotting, non-physiologic discharge, vaginal irritation, burning, and itching. Topical estrogen in the trials involved the use of 0.5 mg of Estriol cream vaginally every night for 2 weeks, then twice a week for 8 months.

### Antimicrobial Prophylaxis

This should be considered only in patients in whom life style and behavioral modifications fail to work and should only be started after the treatment of acute phase i.e. after a negative culture post treatment. Before any prophylaxis regimen is initiated, eradication of a previous UTI should be confirmed by a negative urine culture 1-2 weeks after treatment. Prophylaxis may be:

**a. Low dose continuous:** Choice of antibiotic should depend upon allergies, prior

susceptibility, local resistance patterns, cost and side effects. Success depends upon the effect that the antimicrobial agent has on introital and bowel bacterial reservoir. Drugs that reduce the pathogenic bacteria & do not increase resistance are ideal. A six-month prophylaxis may be given if rUTI > 1 year. Effective drugs are Trimethoprim-Sulphamethoxazole (TMP-SMX) or TMP alone, nitrofurantoin, cephalexin (in minimal dosage), and the fluoroquinolones.

This regimen has a 95% efficacy in reducing recurrences. Urine culture should be repeated every three months to look for break through infections. In case of a break through infection a full course of antibiotics should be given and after treatment prophylaxis should again be restarted. Patients should be counselled about the risk of side effects of long term treatment.

**b. Self-start intermittent treatment:** This is for patients who do not want long term prophylaxis. The patient is given a dip slide device for culture and a three-day course of empirical antibiotic. Patient can identify episodes of infection, perform their own culture and begin a standard three-day course of antibiotics. They are asked to inform if symptoms present after 48 hrs. Best suited for this regime are women who are motivated, compliant and willing for follow up. Effective drugs are Nitrofurantoin (100 mg twice a day for 5 days), TMP –SMX (160/800 mg one double strength tablet twice daily for 3 days), Fosfomycin (3 g single dose), Pivmecillinam (400 mg, twice daily for 5 days).

**c. Post coital:** Post coital antibiotic prophylaxis is another effective measure to prevent UTIs in woman when sexual activity usually precedes UTI. Post-coital treatment involves taking a single dose of antibiotic within two hours of intercourse allowing for decreased cost and presumably side effects. Cochrane review stated that post coital prophylaxis was equally effective as low-dose continuous antibiotic prophylaxis.<sup>5</sup>

### **Non Antibiotic Strategies**

Many non-antibiotic strategies exist for treatment of recurrent UTIs. There are currently no recommendations to advocate the routine use of any of these methods.<sup>3</sup> A few of these are listed below:

- **Cranberry extract:** prevents the adherence of uropathogens to uroepithelial cells. Latest Cochrane review states that evidence of benefit of cranberry juice for preventing UTI is small and it cannot currently be recommended for the prevention of UTIs.<sup>5</sup>
- **Acidification of urine:** bacteriostatic effect in urine, mediated by the reduction of urinary nitrites to reactive nitrogen oxides rather than by lowering urinary pH.
- **D- mannose:** Inhibition of bacterial adherence to urothelial cells. Not recommended in routine use
- **Lactobacillus suppositories**

### **Referral to specialist**

Specialist referral for recurrent uncomplicated UTI is indicated when risk factors for complicated

UTI are present. Referral is also indicated when a surgically correctable cause of UTI is suspected or the diagnosis of UTI as a cause for recurrent lower urinary tract symptoms is uncertain.<sup>2</sup>

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# Bladder Pain Syndrome: What a Gynecologist Should Know?

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Bladder Pain Syndrome/ Interstitial (BPS/IC) is considered as a chronic debilitating condition with a severely negative impact on a patient's quality of life. Its prevalence ranges from 52 to 500/100,000 in females compared to 8–41/100,000 in males, and its incidence is increasing globally.<sup>1</sup>

The term 'Interstitial cystitis' was first described by Skene in 1887, who mentioned about destruction of mucous membrane of bladder by inflammation, which appeared to spread into the wall of urinary bladder. Later Guy Leroy Hunner, a Boston gynaecologist, from Johns Hopkins, for the first time in 1914 described a symptom complex of bladder pain associated with a unique cystoscopic finding of mucosal lesions, the "elusive ulcer", later termed Hunner's ulcer. For a number of years, this finding was the hallmark of IC and the ulcer was thought to be the cause of symptoms in these women.<sup>2</sup> Therefore the interest of gynaecologists in this disease is not new, as it is predominantly prevalent in women population and almost every gynaecologist has encounters with these patients.

The National Institute of Diabetes and Digestive and Kidney Diseases proposed a criterion to define this disease in the late 1980s.<sup>3</sup> Later it was noted in many studies that the diagnosis can be missed in more than 60% of patients once these strict criteria are applied, especially those without typical Hunner's ulcer but suffering in a similar manner. Therefore more relaxed diagnosing criteria have been proposed by different regulatory bodies (Japanese, American Urological Association (AUA) or by the European Society for Study of Interstitial Cystitis (ESSIC).<sup>4,5,6</sup> It was felt that pelvic pain which was related to micturition cycle and presented with lower urinary tract symptoms (LUTs) could be categorized as single entity 'Bladder Pain Syndrome'.<sup>5</sup> It included different terms in use like interstitial cystitis, painful bladder syndrome, urethral syndrome, trigonitis under one category to avoid confusions.

Today most acceptable definition as proposed by the Society for Urodynamics and Female Urology (SUFU) is "An unpleasant sensation (pain, pressure,

discomfort) perceived to be related to the urinary bladder, associated with LUTs of more than six weeks duration, in the absence of infection or other identifiable causes."<sup>7</sup> With this, treatment can be started early after a relatively short symptomatic period after few preliminary investigations and without the need of advanced invasive investigations like cystoscopy and/or bladder biopsy.

## Clinical Approach

The diagnosis is based on the symptom complex with subjective perception of bladder as a source and after excluding other identifiable causes for the symptoms. High clinical index of suspicion is the key to diagnosis. It is equally important not to over diagnose this condition.

## History

**Pain** or discomfort in lower abdomen and / or urogenital area. Patient will never have fear of leaking urine but would not be able to hold urine due to increase in pain with bladder filling. This vary symptom differentiate it from OAB (Overactive Bladder) as a cause of **Urgency**.

The patients often learn to quickly empty their bladder to avoid pain in BPS leading to increase in **Frequency**. At night also, the patient wakes up because of pain rather than a desire to pass urine due to full bladder.

The classical presentation is immense urge with increasing suprapubic pain or discomfort as bladder fills, which is usually relieved by voiding although soon returning. Descriptions of discomfort may vary like "pressure", "burning", "pricking" or "sharp". Sometimes pain can be felt at locations other than suprapubic region like urethra, vagina, lower abdomen and back, medial aspect of the thigh or inguinal area as referred pain.<sup>7</sup>

History of following confusable diseases should also be elicited to exclude other causes: Prior pelvic surgery; Urinary stone disease; Pelvic inflammatory disease; presence of vaginal discharge;

Vulvovaginitis: It will be associated with superficial Dyspareunia (Deep Dyspareunia indicates BPS); Prior pelvic radiation; Infertility; Pelvic endometriosis: Pain intensity increases usually around menstrual cycle; History of neurological disease to rule out Neurogenic bladder ('Burning character' of pain suggestive of neuropathic pain); Pain at anus or getting relieved after passing stools, may suggest an intestinal pathology.

Other important points, which should be included in the history are: History suggestive of aetiology: allergies to food or drugs/ allergic bronchitis or bronchial asthma / other allergic disorders like Seasonal hay fever or urticaria / autoimmune disorders; History of obstructive symptoms: in women due to pelvic floor spasm; Recent change in diet, like health drinks, excessive tea/ green tea/ coffee/ dark chocolates or something else which the patient wasn't used to earlier eg. change of diet due to geographical translocation; Recent drug treatment for unrelated disease; History of associated diseases/ co- morbidities like fibromyalgia, irritable Bowel syndrome, anxiety, stress or migraine. They might be of importance in the identification of various phenotypes of this disease.

## Examination

**General** - Gait of the patient, Mental state of the patient, Somatic signs of anxiety like pallor, sweating etc.

**Abdominal examination** - any masses, abdominal tenderness especially suprapubic, or previous surgical scars are noted.

**Local examination** - Any area of tenderness in perineum, tone of the pelvic floor muscle and trigger points need to be noted. Any Myofascial bands must also be looked for. Tenderness on pressing anterior fornix may indicate presence of BPS.

**Neurological examination** if indicated

## Investigations

The investigations are primarily aimed at excluding the diseases with specific aetiology.

- **Frequency volume chart** gives a fair idea of the functional bladder capacity. This serves a valuable evidence to objectively evaluate the progress of disease and its response to treatment. The voided volume, spacing in between and the number of voids can be objective parameters for further intervention.

- **Urine analysis:** The absence of pus cells in the urinary sediments, leucocyte esterase (LE) or nitrite in the urine sample almost excludes the diagnosis of urinary infection. Presence of red blood cells in urine should indicate a detailed evaluation of the urinary tract malignancy starting with the **urine cytology** for malignant cells and might require CT urography and cystoscopy if persistent. It will be wise to refer these patients to Urologists, in case of suspicion of malignancy.

- **Ultrasonography** (optional) of the urinary tract to exclude any pelvic pathology likely to be the cause of symptoms, including significant post void residual urine (especially in presence of symptoms of voiding dysfunction).

- **Anesthetic challenge test** (optional) is a simple test to demonstrate that the pain is indeed originating from bladder. 20 ml of 1% lignocaine may be instilled in bladder by a per urethral soft small calibre catheter after evacuating any urine from the bladder. There is an immediate relief from pain which stays for almost an hour or more. This indicates that the pain is indeed originating from bladder. But this is not a specific test as pain due to any bladder inflammation would be relieved on instilling lignocaine in bladder. However, it is very useful when differentiating pelvic pain originating from uterus or adnexa (e.g. endometriosis) or colon.<sup>8</sup>

- **Symptom scores** O'Leary Saint symptom score and Pain Frequency Urgency (PUF) score are useful for the follow-up and documentation of these patients.<sup>9</sup>

- **Cystoscopy** This serves as a diagnostic investigation to rule out other pathologies as well as a therapeutic procedure providing an opportunity to perform hydrodistension and to ablate Hunner's lesions in the bladder. Therefore it should always be planned under general anaesthesia. AUA does not recommend cystoscopy in all cases of BPS, especially to confirm the diagnosis at initial stage in absence of complicating factors.<sup>5</sup> However, ESSIC recommends cystoscopy at an early stage to differentiate between Hunner's and Nonhunner's types.<sup>6</sup> There is no international consensus in this regard till date.

- **Biopsy of any bladder lesion** must be taken at time of cystoscopy in presence of suspicious lesions to exclude a different pathology like cystitis cystica, tubercular granuloma or urothelial malignancy.

- **Urodynamic evaluation** in select cases to distinguish between this condition and neuropathic bladder, OAB or any other voiding dysfunction.
- **Laparoscopy** reserved for cases where the chronic pelvic pain strongly suggests a cause other than bladder.

While evaluating a case of suspected BPS, all confusable disease entities must be carefully excluded.

## Management

### Education

The management should begin with the detailed discussion of the disease and its prognosis with the patient and her family members. It must be emphasized that the treatment might be prolonged and the relief might be slow to appear. There could be need to change medications during the course of treatment as this is a heterogeneous entity and the response to a single regimen may differ in due course of the disease.

### Oral Non-Specific Medication

**Urine Alkalisers:** Simply changing the acidic pH of urine to neutral or slightly alkaline can reduce the pain in such patients.

**Amitriptyline (Tryptomer)** is a tricyclic antidepressant and has central and peripheral action. Apart from relieving neuropathic pain, it also stabilizes bladder contractility by its anticholinergic effect. This should be the treatment of choice in patients with the 'burning' or 'pricking' character of pain. Its main side effects are sedation, dryness of mouth and constipation. Dose: 10 mg at bedtime slowly escalated to 25 mg two/ three times a day.

**Hydroxyzine (Atarax)** is anti-histamine. In patients with history of allergies like seasonal rhinorrhea, urticarial or bronchial asthma should be considered for use of this drug. Hydroxyzine is usually well tolerated but has a sedative effect in some individuals. Dose: 10 mg oral tablet at bed time but can be increased to 25 mg two to three times a day.

**Skeletal muscle relaxants** like clonazepam or cyclobenzaprine may be used if the symptoms are suggestive of pelvic floor spasm or on examination there are tender trigger points in levator ani muscle. Dose: Clonazepam 0.25 mg at bed time; Cyclobenzaprine 15 mg at bed time. The main side effects of this class of drugs are sedation and light headedness.

**Analgesics** like tramadol, Gabapentin and pregabalin. These medicines must be used with caution as drug dependency is a frequent occurrence.

## Oral Specific Medication

**Pentosan Polysulphate (PPS)** is a synthetic sulphated polysaccharide which may be used as oral tablet or intravesical instillation. It is estimated that 4-6% of this drug when ingested orally is excreted unchanged in urine. It is expected to replenish the Glycosamine Glycan (GAG) layer of the urothelium which is responsible for the impermeability of the urothelium. It is recommended in the dose of 100 mg three times a day, to be taken at least 1 hour before or 2 hours after meals to improve the bioavailability of drug. Usually the drug is well tolerated as the incidence of overall adverse events is almost 4% which include alopecia, diarrhoea, nausea, rash and rarely bleeding tendencies. A trial for at least 3-6 months must be given before labelling a failure to treatment.

## Intravesical Treatments

The aim of administering Intravesical treatment is to achieve high drug concentrations at the target, with few systemic side-effects. But the drawback is its invasiveness, which can be even painful and may increase the risk of infection. Various clinically available GAG replenishing molecules are Heparin, PPS, Hyaluronic acid and Chondroitin Sulphate. AUA Guidelines recommend it as second-line treatments for BPS/IC (Option).<sup>5</sup>

### Other agents recommended are:

**DMSO** (recommended by AUA and RCOG guidelines Gr C,<sup>10</sup> Asian guidelines Gr B). Rapid absorption into the bladder wall might lead to significant pain, if it is held beyond 15-20 minutes after instillation. Most patients recognized a garlic-like odour, and a few patients felt bladder spasm possibly due to mast cell degranulation.

Caution should be taken while using it in "cocktail" preparation, as there could be a chance of toxicity due to potential increase in absorption of some substances like lidocaine, in its presence.

**Heparin** (recommended by AUA and Asian guidelines Gr C, RCOG guideline Gr D) Intravesical dose ranges from 10,000 IU to 40,000 IU. Adverse Effects (AEs) are rare and minor. It is considered a safe option in pregnancy also (RCOG Gr D).<sup>10</sup>

**Lidocaine** (recommended by AUA, RCOG and Asian



guidelines Gr B) Penetration into urothelium and therefore efficacy can be increased by adding alkaline, but on other hand potential increase in systemic absorption may increase the chances of toxicity. Dysuria, urethral irritation, and bladder pain are reported AEs, which usually get relieved within two weeks.

**Hyaluronic acid** (recommended by RCOG Gr B and Asian guidelines Gr c), **Chondroitin sulfate** (recommended by Asian guidelines Gr c and RCOG Guidelines Gr D) and **Pentosan polysulfate intravesical preparation** (recommended by Asian guidelines Gr c) are commercially not available in India except the last one (recently introduced in the Indian market).

**Intravesical resiniferatoxin** and **Intravesical Bacillus Calmette–Guérin** are therapies that are not recommended for BPS.

## Cocktail Therapy

The rationale is that combination might potentiate the effect resulting in better outcome.

Few examples are:

1. Anaesthetic cocktail – Robert Moldwin, MD (1:1 mixture of 0.5% Marcaine and 2% Lidocaine jelly, Heparin sulphate 10,000 IU, Triamcinolone 40 mg and/ or Gentamycin 80 mg)
2. DMSO cocktail – Philip Hanno, MD (DMSO 50 cc/ Sodium bicarbonate 44 meq/ Kenalog 10 mg/ Heparin 20,000 IU)
3. Heparin cocktail with alkalinized lidocaine – C. Lowell Parsons, MD (Heparin 40,000 IU/ Lidocaine 2% 8 mL/ Sodium bicarbonate 8.4% 3 mL)

## Limitations

1. There is no data showing superior safety or efficacy of these intravesical medications alone or in various combinations in cocktail.
2. Mostly interval between instillation therapies is kept at 1- 2 weeks but patients are using it as and when required basis also. Currently no guideline has clear recommendations in this regard.<sup>2</sup>

## Dietary Modification

Most of these patients report association of symptom aggravation with certain food items, which may include coffee, tea, caffeinated drinks, chocolates, citrus fruits, apple, pineapple, carbonated and alcoholic beverages, tomatoes, spices like red and green chillies, black pepper; artificial sweeteners, and

dairy products. It is usually suggested to maintain a personal food diary by stopping all suspected food items for a time period till symptoms got relieved and then start these again one by one at interval of 3-4 days to notice any change in symptoms with any particular food item.<sup>2</sup>

## Conclusion

The science of IC/BPS is ever evolving. The Gynecologists have to remain abreast with the changing terminology and definitions in order to identify and treat these patients efficiently. Now it is the time to shed your apprehension and embrace this disease as your patient will feel most satisfied with you only. For refractory cases requiring advanced management, you can refer these patients to specialists as per need like urogynecologists, urologists or pain management team.

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# Sexual Dysfunction in Women: A Myth or Reality!

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## Introduction

Sexual function is an essential component of life, both in species propagation as well as quality of life. Sexual dysfunction can lead to reduced quality of life. The incidence of women sexual dysfunction (WSD) is around 30% - 50%.<sup>1</sup> It is a highly underreported problem, as approximately 1/3rd of women never initiates any discussion about their sexual issues, and it has been rarely reported spontaneously as a symptom.

The topic of female sexual health and dysfunction is a challenging one for health care providers. Discomfort with the topic, inadequate training, and insufficient clinical time with patients to discuss in-depth sexual histories and limited treatment options hinder providers' desire to address this issue.

As providers, we should bring up the topic of sexual health because only approximately 18% of women with sexual concerns will spontaneously volunteer information about sexual dysfunction to their doctor.<sup>2</sup>

With the development of DSM-5 in 2013 Female sexual dysfunction (FSD) was recently redefined, and now includes Female Sexual Interest/ Arousal Disorder (FSIAD), Female Orgasmic Disorder and Genito pelvic Pain/ Penetration Disorder.<sup>3</sup>

To be considered dysfunctional, these symptoms must cause distress and must occur at least 75% of the time over a 6-month period.

The most common disorders are related to desire. Desire disorders include hypoactive sexual desire disorder (HSDD) and sexual aversion disorder. HSDD, which is described as decreased libido, is by far the most common issue for women, whereas sexual aversion disorder is quite rare. The prevalence rates for arousal, orgasm, and pain complaints are similar. Based on a 2006 review of published literature on prevalence studies of FSD, in women with sexual complaints, the average prevalence of women who experienced desire difficulties was 64%, arousal difficulties 31%, orgasm difficulties 35%, and sexual pain 26%.<sup>4</sup>

## Pathophysiology

The causes of FSD are multiple and variable and often it is difficult to understand the initial aetiology. Aetiologies include organic elements

such as hormonal, neurological, vascular issues, psychosocial factors such as relationship issues, social stressors, mood, history of physical or sexual abuse, and psychiatric history, neurotransmitters too play an important role. For appropriate female sexual function, delicate balance of dopamine for desire, and epinephrine, norepinephrine, and serotonin for arousal and orgasm is necessary. Disorders and medications that disrupt these elements may lead to FSD. Hormonal deficits may be another factor in pathophysiology. The decrease in estrogen associated with menopause may induce decreased sexual desire and atrophy of genital tissue that leads to painful intercourse.<sup>5</sup>

Not surprisingly, numerous biopsychosocial factors impact sexual function. Multiple medical and mental health conditions can impact sexual health. Family and cultural beliefs, early sexual experiences, partner relationship, and external stressors also play a strong role. Exploring these issues with patients may reveal modifiable obstacles to sexual fulfilment through better disease management, medication changes, mental health treatment, and discussion around personal and cultural beliefs or counselling.

## History

A detailed sexual history should include questions about the patient's sexual and gender identity; the nature, duration, and onset of the symptoms; the presence of personal distress about symptoms; self-care, self-medication, or other efforts to alleviate the symptoms; partner factors, including current number of partners as well as their gender, health problems, and sexual function problems; relationship quality, including communication about the patient's sexual concerns; past and current abuse or violence experienced;<sup>6</sup> physical activity, injuries (eg, straddle or coccyx), and behaviours (eg, hygiene and chronic sitting) related to the genito-pelvic area; sleep quality; and body changes or image concerns (eg, mastectomy, ostomy, or pregnancy).

Likewise, relationship distress and partner sexual dysfunction also should be identified and addressed. Because dysfunction in one domain can trigger sexual problems in another domain (eg, pain can

result in loss of libido), evaluation should identify the temporality of the symptoms and their evolution over time.

Various validated self-report questionnaires to assess sexual function in symptomatic women have been developed for use in the research setting, but they also may be useful adjuncts to the clinical interview and sexual history. Examples include the Female Sexual Function Index and the Female Sexual Distress Scale.<sup>7</sup>

## Physical Examination

Physical examination may be focused with the following in mind. Thyroid disease may be contributory to FSIAD, and a thyroid exam must be included. In examining external female genitalia, look for any skin lesions or atrophy. Pelvic examination is most helpful in women who are complaining of sexual pain, and should specifically look for findings of atrophy or areas of tenderness that may relate to their complaints. Some specific areas should be focussed in the pelvic exam are the vulvar vestibule (provoked vulvodynia), levator and perineal body muscle soreness (vaginismus), rectovaginal nodularity (endometriosis), and anterior wall/ bladder (interstitial cystitis or painful bladder syndrome).<sup>5</sup>

## Diagnosis

Most FSD diagnoses are made based on history alone, and laboratory evaluation is rarely helpful. A fraction of patients with desire complaints may have underlying thyroid dysfunction, so a TSH (Thyroid

Stimulating Hormone) screen may be helpful. Serum testing for estrogen and androgens is rarely necessary. Occasionally testing of gonadotropins or estrogen may be helpful in women for whom the diagnosis of menopause is in doubt, for example following hysterectomy.<sup>5</sup>

## Treatment

Reassurance and education and allaying patient concerns are the most important part of management of sexual dysfunction. Setting reasonable goals and expectations is important, as sexual dysfunction of long duration is often unlikely to resolve quick.<sup>8</sup>

Treatment of sexual dysfunction depends on the underlying disorder. Treatment may include counselling, education, and reassurance. Once correctable causes have been addressed or ruled out, medical intervention may be considered.

### Female Sexual Interest/ Arousal Disorder (FSIAD)

Because FSIAD may be a side effect of medications, a frequent solution is adjustment of other prescriptions. Antihistamines, beta blockers, diuretics and hormonal contraceptives, the most common culprits are SSRI antidepressants. Dose adjustment is very important for improving sexual function.<sup>9</sup>

One medication that is FDA-approved to treat Female Sexual Interest/ Arousal Disorder is flibanserin, a 5HT<sub>1A/2B</sub> agonist/antagonist. It is indicated for premenopausal women with low sexual desire. It is taken nightly and requires daily use. Side effect include syncope and hypotension. The FDA approved bremelanotide in June 2019

## Differential Diagnosis

Sexual interest/ arousal dysfunction	Orgasmic dysfunction	Genitopelvic pain/ penetration disorder
Relationship issues	Neurological disorders	Vulvovaginal Atrophy
Prior pelvic surgeries	Radiation therapy	Vulvodynia Vaginismus Vestibulodynia Vulvitis/Vaginitis Endometriosis Adenomyosis Uterine Leiomyomas
Vascular disorders	Genital cutting procedures	Survivor of Physical, Sexual, Emotional, or Mental Abuse
Depression and other psychiatric disorders		GI Etiologies (Irritable bowel, Irritable bowel disease, chronic constipation)
Medications (psychiatric, opioids, antihypertensives)		Genitourinary Causes (Painful bladder syndrome)
Survivor of physical, mental, sexual or emotional abuse		Vulvar intraepithelial, neoplasia, vulvar atrophy, lichen sclerosis, condyloma
Possible sex hormone deficiency		Pelvic Inflammatory Disease

for acquired, generalized hypoactive sexual desire disorder (HSDD) in premenopausal women. It is administered as a subcutaneous injection about 45 minutes before an anticipated sexual activity.

### **Genitopelvic Pain/ Penetration Disorder**

They are benefitted from topical estrogen, which improves vaginal epithelial integrity, reduces sensitivity and improves elasticity of the vaginal tissues. Topical estrogen is available as a cream, tablet, or continuous-release ring. Topical prasterone (DHEA) has recently been FDA-approved for the same indication. Ospemifene, an oral selective estrogen receptor modulator, is also approved to treat dyspareunia by reversing genital atrophy. Nonestrogen lubricants and moisturizers may also be helpful for patients with Genitopelvic Pain/ Penetration Disorder.

When sexual pain is associated with restrictive disease from vaginismus or narrowing of the introitus, additional therapy may be needed. Pelvic floor physical therapy may be necessary in conjunction with specific counselling to help with painful muscular contraction of the vaginal muscles. For patients with restrictive disease due to atrophy or radiation injury, dilator therapy is another useful tool.<sup>10</sup>

### **Female Orgasmic Disorder**

Inhibition of orgasm is another common side effect of SSRIs. As with FSIAD, women with orgasmic dysfunction may benefit from an adjustment in antidepressant therapy. Again, consideration must be given to the balance between the medication side effects and benefits of continuing effective antidepressants.

Other treatment modalities - Patients with relationship stagnation, infidelity, other relationship problems, and/ or survivors of abuse may benefit from psychological counselling.

Referral to a gastroenterologist or urologist is helpful for patients with gastrointestinal or urologic conditions that are suspected causes of their sexual pain.

Patients for whom sexual pain is thought to arise from a musculoskeletal etiology often benefit from pelvic floor physical therapy.

Patients with a neuropathy related to poorly controlled diabetes may benefit from neurology referral.

Patients may benefit from routine exercise with moderate physical exertion 150 minutes per week,

or 75 minutes per week of high intensity exertion, as appropriate for the patient.

### **Prevention**

There is evidence that continued sexual activity is protective against later development of sexual dysfunction in menopausal women. It is physiologically plausible that sexual stimulation leads to increased blood flow and preserved elasticity that may protect against vulvovaginal atrophy and its sexual sequelae.

### **Conclusion**

Sexual dysfunction in females is much more common than it is anticipated and due to sensitivity of the topic and shyness among Indian women, it is rarely discussed and affects the quality of life to a great extent. Hence, we as gynaecologists should be aware of this problem try to identify it and provide counselling and solution for the same.

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# Sexual Dysfunction and Associated Depression in Postmenopausal Incontinent Women: A cross-sectional case-control study

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## Abstract

**Background:** Female sexual dysfunction (FSD) has higher prevalence in postmenopausal women especially with urinary incontinence (UI) and coital incontinence (CI). **Objective:** To determine the prevalence of FSD, CI and depression in postmenopausal women with UI. **Material and Methods:** Cross-sectional case-control study of 100 menopausal women with previously diagnosed UI with matching continent controls over period of 3 months were analyzed for the prevalence of FSD, CI and depression using validated questionnaires like Female Sexual Function Index (FSFI) and Primary Health Questionnaire-9 (PHQ-9). **Statistical Analysis** was performed using SPSS version 19.0. **Results:** UI is independently associated with FSD, CI and depression ( $p < 0.001$ ) with prevalence of 100%, 83%, and 100% respectively for cases versus 5%, 6%, and 4% respectively for controls. FSD and CI are also independently associated with depression ( $p < 0.001$ ). Combined FSD with UI and CI with UI are also significantly associated with depression. **Conclusion:** UI is independently associated with FSD, CI and depression. FSD and CI are also independently associated with depression. UI is the major determinant of depression in those with both FSD and UI or CI and UI.

**Keywords:** Female sexual dysfunction (FSD), urinary incontinence (UI), coital incontinence (CI), depression, sexual health.

## Introduction

Women today live 1/3<sup>rd</sup> of their lives after menopause. Sexual wellbeing is an important part of postmenopausal woman's health.<sup>1</sup> Female sexual dysfunction (FSD) has a prevalence of 25%-63% amongst all women, with a higher peak in postmenopausal women, 68%-86.5%.<sup>2</sup> Its association with Urinary and Coital incontinence (leaking during intercourse) multiplies it manifold.<sup>1,3,4</sup> FSD is often marred by the 4 U's i.e., being unaddressed,

underestimated, undiagnosed and untreated.<sup>1</sup> These women are significantly depressed which also needs addressal and treatment.<sup>5</sup> FSD and depression are amenable to treatment with the management of underlying Urinary Incontinence (UI).<sup>3</sup> There is a dearth of literature regarding quantitative approach to measure FSD in incontinent women and its associated depression especially in Indian scenario. Thus we aimed to determine the prevalence of FSD, Coital Incontinence (CI) & Depression in postmenopausal urinary incontinent women and their matching continent controls.

## Methodology

A cross-sectional case-control study was conducted in the urogynecology division of the obstetrics and gynecology department of a tertiary care teaching hospital from 1<sup>st</sup> February, 2020 to 1<sup>st</sup> May, 2020 after prior permission from the institutional ethics committee (Ref/2020/01/030778) involving 100 previously diagnosed patients of incontinence [Stress UI (SUI)/ Urge UI (UII)/ Mixed UI (MUI)] as cases and their accompanying relatives without incontinence as matching controls (100) to remove any confounding variables. Taking prevalence rate as 70%, allowable error 10%, sample size required is 171 with formula  $4pq/L^2$ .

The women were **enrolled** in the study if they had acquired 1) natural menopause and were not on systemic/local hormonal replacement therapy, 2) were willing to talk about their sexual life and depression, 3) had recent heterosexual partnered activity with vaginal intercourse in the past 4 weeks, and 4) had a normal urine routine and culture report.

They were **excluded** from study if they had 1) a history of pelvic surgery/incontinence surgery/pelvic malignancy/radiation, 2) a history of postmenopausal bleeding, 3) current urinary tract infection/pelvic inflammatory disease/  $\geq$  stage 2 POPQ prolapse/congenital vaginal abnormalities, 4) sexual dysfunction due to male partner issues,



5) depression due to causes other than UI/FSD, 6) normal bereavement, and 7) history of maniac/hypo maniac episode or senile dementia.

A detailed history as regards to their demographic profile, marital status, medical and surgical history, gynecological/urological/obstetric/sexual history, menopausal status, and current medications was taken. Detailed general and local examination was done. Permissions were sought beforehand for the use of 2 validated questionnaires– 1) Female Sexual Function Index (FSFI)- the short form of Urogenital Distress Inventory (UDI-6) with 19 questions for subjective validated measure of female sexual function having 6 domains like desire, arousal, lubrication, orgasm, global sexual satisfaction and pain **for quantifying FSD**,<sup>6</sup> and 2) the Prime-MD Patient Health Questionnaire, 9-item (PHQ-9) **for quantifying depression**- in conformity with the Diagnostic and Statistical Manual of Mental Disorders, 4<sup>th</sup> Edition (DSM-IV) especially validated for use in obstetrics and gynaecology outpatient clinics.<sup>7</sup> FSFI score ranges from 2 to 36 with a validated cut-off score of  $\leq 26.55$  signifying Female Sexual Dysfunction (FSD). The PHQ-9 scores of 0-4, 5-9, 10-14, 15-19 and 20-27 represents none or minimal, mild, moderate, moderately severe and severe depression, respectively with a PHQ-9 score of  $\geq 10$  having 88% sensitivity and specificity for major depression. Subjects were also interrogated for Coital incontinence (CI), i.e. leaking during intercourse. Both the questionnaires were not validated in Hindi for use. The permission for their use and verbal translation in Hindi was sought beforehand. The principal investigator translated them verbally in Hindi for patient understanding. Informed and written consent was taken beforehand. The data so obtained was kept confidential, and the whole study was conducted in accordance with the ethical guidelines of Declaration of Helsinki and its amendments. The statistical analysis was performed using SPSS version 19.0. Pearson Chi Square test was applied to assess the various correlations in the data.

## Results

Most of our cases were 51-60 years of age (65%), married (84%), and belonged to low socio-economic status (SES) (62%) with mean duration of incontinence was 17.44 months (range 6 – 60 months) (Table 1).

UUI was present in 88% of our cases, and 6% each had SUI and MUI. All (100%) of our UI women

**Table 1:** Demographic data of Cases & Controls

Demographic variable	Cases	Controls
Age Group (years)		
51-60	65 (65%)	65 (65%)
61-70	34 (34%)	34 (34%)
>70	1(1%)	1(1%)
Marital Status		
Married	84 (84%)	84 (84%)
Never married	4 (4%)	4 (4%)
Divorced/ Separated/ Widowed	12 (12%)	12 (12%)
Parity		
1	3 (3%)	3 (3%)
2	5 (5%)	5 (5%)
3	76 (76%)	76 (76%)
$\geq 4$	16 (16%)	16 (16%)
Socioeconomic status (SES) (Modified Kuppaswamy's SES scale) <sup>8</sup>		
Upper	6 (6%)	6 (6%)
Upper middle	32 (32%)	32 (32%)
Lower middle	40 (40%)	40 (40%)
Upper lower	22 (22%)	22 (22%)
Education		
College graduate	7 (7%)	7 (7%)
Partial college	17 (17%)	17 (17%)
High school graduate only	76 (76%)	76 (76%)
Body Mass Index (BMI) (Kg/m <sup>2</sup> )		
18.5-24.9 (Normal weight)	6 (6%)	6 (6%)
25-29.9 (Over weight)	70 (70%)	70 (70%)
30-34.9 (Obese Type I)	24 (24%)	24 (24%)
Mode of delivery		
Vaginal	91 (91%)	91 (91%)
Caesarean section	9 (9%)	9 (9%)

(cases) had FSD (FSFI score of  $\leq 26.55$ ), whereas in controls only 5% had FSD with 95% having scores of  $>26.55$  ( $p<0.001$ , highly significant) (Table 2). Of the various domains of FSFI Scoring, 41% had desire disorders, 16% had arousal disorders, 7% had lubrication issues, 7% had orgasmic issues, 23% complained of a lack of global satisfaction and 6% reported sexual pain issues. Amongst our UI women 83% leaked during sexual intercourse (coital incontinence, CI) compared to only 6% of controls ( $p<0.001$ ; highly significant) (Table 2). All (100%) of our UI women had depression (PHQ-9 scoring) with as high as 48% having severe depression, and 45% having moderately severe depression versus 0% and only 4% respectively for controls ( $p<0.001$ , highly significant) (Table 2).

We tried to correlate FSD in subjects (cases and controls) with depression (PHQ-9 scoring) and found that in the absence of FSD as high as 70.53% were not depressed, 25.26% were

**Table 2:** Female Sexual Dysfunction (FSD), Coital Incontinence (CI) and Primary Health Questionnaire-9 (PHQ-9) scoring in Cases and Controls

A. Female Sexual Dysfunction (FSD) in Cases and Controls					
FSD	Cases		Controls		Total
	N	%	N	%	
Present	100	100.0	5	5.0	105
Absent	0	0.0	95	95.0	95
Total	100	100.0	100	100.0	200
$\chi^2 = 180.952$ ; df = 1; $p < 0.001$ ; Highly significant					
B. Coital incontinence (CI) in Cases and Controls					
CI	Cases		Controls		Total
	N	%	N	%	
Present	83	83.0	6	6.0	89 (44.5%)
Absent	17	17.0	94	94.0	111 (55.5%)
Total	100	100.0	100	100.0	200
$\chi^2 = 101.282$ ; df = 1; $p < 0.001$ ; Highly significant					
C. Primary Health Questionnaire-9 (PHQ-9) Scoring for Depression in Cases and Controls					
Depression (PHQ-9)	Cases		Controls		Total
	N	%	N	%	
None/ Minimal	-	-	71	71.0	71
Mild	2	2.0	13	13.0	15
Moderate	5	5.0	12	12.0	17
Moderately severe	45	45.0	4	4.0	49
Severe	48	48.0	-	-	48
Total	100	100.0	100	100.0	200
$\chi^2 = 164.255$ ; df = 4; $p < 0.001$ ; Highly significant					
The PHQ-9 scores in cases varied between 19.41 to 21.17 with a standard error of 0.442					
The PHQ-9 scores in controls varied between 4.29 to 5.85 with a standard error of 0.395					

**Table 3:** Correlation of Female Sexual Dysfunction (FSD) with Primary Health Questionnaire- 9 (PHQ-9) scoring and of FSD and Urinary incontinence (UI) with PHQ-9

A. Correlation of Female Sexual Dysfunction (FSD) with Primary Health Questionnaire-9 (PHQ-9) scoring							
FSD	Depression					P value	
	None/ minimal	Mild	Moderate	Moderately Severe	Severe		
	N (%)	N (%)	N (%)	N (%)	N (%)		
Absent (n=95)	67 (70.53)	13 (13.68)	11 (11.58)	4 (4.2)	0 (0%)	p < 0.001	
Present (n=105)	4 (3.81)	2 (1.9)	6 (5.7)	45 (42.86)	48 (50.4)		
x2 value = 147.614; df = 4; p < 0.001; Highly significant							
B. Correlation of FSD and Urinary Incontinence (UI) with PHQ-9							
Group	FSD	Depression					P value
		None/ minimal	Mild	Moderate	Moderately Severe	Severe	
		N (%)	N (%)	N (%)	N (%)	N (%)	
Cases	Absent	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	-
	Present	0 (0)	2 (2.0)	5 (5)	45 (45.0)	48 (48)	
Controls	Absent	67 (70.5)	13 (13.7)	11 (11.6)	4 (4.2)	0 (0)	0.745
	Present	4 (80.0)	0 (0)	1 (20.0)	0 (0)	0 (0)	NS
NS: p > 0.05; Not significant							

**Table 4:** Correlation of Coital incontinence (CI) with Primary Health Questionnaire-9 (PHQ-9) scoring and of CI and Urinary incontinence (UI) with PHQ-9

A. Correlation of Coital incontinence (CI) with Primary Health Questionnaire-9 (PHQ-9) scoring							
FSD		Depression					P value
		None/ minimal	Mild	Moderate	Moderately Severe	Severe	
		N (%)	N (%)	N (%)	N (%)	N (%)	
Absent (n=111)		65 (58.56)	13 (11.71)	13 (11.71)	18 (16.21)	2 (1.8%)	p < 0.001
Present (n=89)		6 (6.74)	2 (2.25)	4 (4.49)	31 (34.83)	46 (51.69)	
x2 value = 104.486; df = 4; p < 0.001; Highly significant							
B. Correlation of CI and Urinary Incontinence (UI) with PHQ-9							
Group	CI	Depression					P value
		None/ minimal	Mild	Moderate	Moderately Severe	Severe	
		N (%)	N (%)	N (%)	N (%)	N (%)	
Cases	Absent	0 (0)	0 (0)	1 (5.9)	14 (82.4)	2 (11.8)	0.006*
	Present	0 (0)	2 (2.4)	4 (4.8)	31 (37.3)	46 (55.4)	
Controls	Absent	65 (69.1)	13 (13.8)	12 (12.8)	4 (4.3)	0 (0)	0.456
	Present	6 (100.0)	0 (0)	0 (0)	0 (0)	0 (0)	NS
NS: p > 0.05; Not significant; *p<0.05; Significant							

mildly or moderately depressed, only 4.2% were moderately severe depressed and none was severely depressed. However in the presence of FSD, severe or moderately severe depression was present in 93.26% (p < 0.001; highly significant) (Table 3). Amongst UI cases, all (100%) had FSD and all of them (100%) were depressed with 48% having severe depression, and 45% having moderately severe depression. Whereas, in those without UI (controls) only 5 patients (20%) had FSD, none of whom had depression except one patient having moderate depression and a non-significant association was found between FSD and depression in them (Table 3).

Similarly, we tried to correlate CI in subjects (cases and controls) with depression and found that in the absence of CI, 58.56% were not depressed, and only 1.8% were severely depressed. However, in the presence of CI, severe or moderately severe depression was present in 86.52% (p < 0.001; highly significant) (Table 4).

A significant association was found between UI and CI with depression in them (p=0.006). Amongst UI cases, 83% had CI of whom all had depression with 46% having severe depression. and 31% having moderately severe depression and Whereas, in those without UI (controls), 6% had CI, none of whom had depression and a non-significant association was found between CI and depression in them (p=0.456) (Table 4).

## Discussion

Immense literature is available addressing UI in women, but little is known about its impact on sexuality,<sup>9</sup> as voicing sexuality is a taboo in Indian society. Though 96% of our sexually dysfunctional incontinent women showed interest in seeking medical advice for their sexual issues, but their primary concern to attend our clinic was still UI. Demographic factors like age, BMI, SES, education, vaginal delivery, self-image perception, and chronic diseases can have a predictive influence on the prevalence of sexual dysfunction, however, similar to other studies we took appropriately matched controls to remove these confounding variables.<sup>10</sup> All (100%) of our UI cases had FSD when quantified on FSFI scoring, whereas only 5% of continent controls had FSD. Our results showed highly significant association between UI and FSD. Literature is abounding with significant association between UI and sexual dissatisfaction, though quantified on different scales. Chun JY et al reported 87% prevalence of sexually dissatisfaction in menopausal women.<sup>11</sup> Temml C et al reported 25.1% prevalence of sexual distress in women of 49.713.6± years of age, levying a huge socio-economic impact.<sup>12</sup> Laumann EO et al reported sexual dysfunction in 43% of women versus 31% of men.<sup>4</sup> Amongst FSD, our study showed desire disorders to be the most common (41%), followed by lack of global satisfaction (23%), arousal disorders (16%), lubrication issues (7%), orgasmic issues (7%) and sexual pain issues (6%).

Hayes et al in his assessment of 11 studies found desire disorders to be the most prevalent type in 64% (range 16-75%) followed by orgasmic difficulties (35%), arousal disorders (31%) and pain disorders (26%).<sup>13</sup> Severe UI with its associated decreased libido, vaginal dryness, dyspareunia, decreased satisfaction, orgasmic dysfunction and premature ejaculation are the various reasons cited in literature for the higher prevalence of FSD in UI women.<sup>3</sup>

We found significantly higher rates of CI in UI women than continent controls, 83% versus 6% respectively. Serati M et al reported CI prevalence of 10%-27% in his thorough literature search on Pubmed on studies between 1970 to 2008.<sup>14</sup> He concluded that CI deserves significant attention as it negatively impacts the sexuality. Having UI itself is the greatest predictor of CI.<sup>1</sup> CI can occur during any phase of coitus, but is more commonly seen during penetration in SUI and during orgasm in UUI. CI is amenable to treatment by resolving the underlying UI.<sup>14</sup> Our study could not differentiate between the two due to the recall bias of our patients.

Analysis of depression was a pertinent part of our study. Our UI women had significantly higher rates of depression than continent controls with 100% of our UI women having depression of whom as high as 48% suffered from severe depression and 45% from moderately severe depression versus 0% and only 4% respectively for continent controls. Zorn et al, in his landmark study showed that all (100%) UI patients had significant depression ( $p < 0.001$ ).<sup>15</sup> We also found highly significant association of FSD with depression with 93.26% of our FSD subjects having moderately severe to severe depression, while in the absence of FSD, 70.53% were not depressed (Table 3A). When analyzing combined UI and FSD with depression, we found that amongst UI cases, all (100%) had FSD and all (100%) of these sexually dysfunctional incontinent women (i.e., having both FSD and UI) were depressed with 48% having severe depression, and 45% having moderately severe depression. Whereas, in those without UI (controls) only 5 patients had FSD, none of whom had depression except one patient and a non-significant association was found between FSD and depression in them (Table 3B). This may be because the predominant group amongst no FSD group was those without UI (all 95 cases) and the predominant group amongst FSD group was those with UI (100 out of 105 cases). This shows that although FSD is significantly associated with depression (Table 3A);

it is even more significant when UI also adds to FSD which causes severe depression in most of the patients having both FSD and UI. In those without UI (controls), the association of FSD with depression did not reach statistical significance because UI is a major factor causing depression, the absence of which makes the association of FSD with depression did not reach its statistical significance. This also shows that underlying UI is the major driving force for both FSD and depression; therefore, diagnosing and treating underlying UI is paramount to the treatment of FSD and depression. Not much literature is published addressing this issue. A closely similar study was done by Cayan S et al who concluded that in UI women there were significantly higher rates of menopausal age group, FSD and depression.<sup>16</sup> We also found highly significant association of CI with depression with 86.52% of CI subjects having moderately severe to severe depression, while in the absence of CI, 58.56% were not depressed (Table 4A).

When analyzing combined UI and CI with depression we found that amongst UI cases, 83% had CI, all of whom had depression with 77% having severe or moderately severe depression and a significant association was found between combined UI and CI with depression. Whereas, in those without UI (controls), 6% had CI with none having depression and a non-significant association was found between CI and depression (Table 4B). The reason for this may be similar to that of combined FSD and UI with depression with the predominant group amongst no CI group being those without UI (94 of 117) and in those amongst CI group being those with UI (83 of 89). Therefore, although CI is significantly associated with depression (Table 4A), it is even more significant when UI also adds to CI. In those without UI (controls), the association of CI with depression did not reach statistical significance because UI is a major factor causing depression, the absence of which makes the association of CI with depression not reach statistical significance. This also shows that similar to FSD, the underlying UI is major driving force for CI and depression; therefore, diagnosing and treating underlying UI is paramount to the treatment of CI and depression.

We used validated questionnaires and had excellent compliance of cases and controls in answering them. However, ours was a cross-sectional study design measuring the prevalence and not the incidence or causal relationships between UI and FSD, CI and



depression thereby limiting the information about the onset of disease and its natural course. FSD, CI and depression are pertinent other variables which significantly affect women presenting with UI even though their main mode of presentation may still be symptoms related to UI. Particular effort to diagnose the magnitude of underlying FSD, CI and depression with validated questionnaires should be made in all such women as these variables significantly affect the outcome of her underlying UI, mental health and sexual life. Thus, it is the duty of every caregiver to assess a menopausal UI woman for sexual dysfunction and depression in every contact, as it is tremendously improves her quality of life.

## Conclusion

UI is independently associated with FSD, CI and depression. FSD and CI are also independently associated with depression. UI is the major determinant of depression in those with both FSD and UI or CI and UI. Every effort should be made to address FSD, CI and depression in all UI patients.

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## Events Held in August 2021

S.No.	Date	Event	Time
1	02.08.2021	"Breast Feeding Awareness" by AOGD Outreach Subcommittee	3:00 pm - 5:00 pm
2	03.08.2021	"IVF Pregnancies: How are they different" by Infertility Subcommittee AOGD and NARCHI	5:00 pm - 7:30 pm
3	03.08.2021	"Breast Feeding Awareness" by AOGD Outreach Committee	3:00 pm - 5:00 pm
4	04.08.2021	"Reining in the CS Pandemic" by NARCHI under aegis of Safe Motherhood Subcommittee	2:30 pm - 4:30 pm
5	04.08.2021	"Breast Feeding Awareness" by AOGD Outreach Subcommittee	3:00 pm - 5:00 pm
6	05.08.2021	QI Workshop by QI Subcommittee	2:00 pm - 5:00 pm
7	05.08.2021	"Breast Feeding Awareness" by AOGD Outreach Subcommittee	3:00 pm - 5:00 pm
8	06.08.2021	QI Workshop by QI Subcommittee	2:00 pm - 5:00 pm
9	07.08.2021	Breast Feeding Awareness by AOGD Outreach Subcommittee	3:00 pm - 5:00 pm
10	07.08.2021	Public Forum for Breast Feeding by AOGD Public Coordinator	3:00 pm - 5:00 pm
11	12.08.2021	"Male Infertility" by Haryana ISAR under aegis of AOGD	3:00 pm - 5:00 pm
12	13.08.2021	"Lactation Management Workshop" by Rural Health Subcommittee	1:30 pm - 4:00 pm
13	13.08.2021	"Improving Fetal Outcomes in Maternal Medical Condition" by Fetal Med Genetics Subcommittee	5:00 pm - 7:00 pm
14	14.08.2021	"Challenges During COVID Pandemic in Population" by Adolescent Subcommittee	2:00 pm - 4:00 pm
15	18.08.2021	"Infertility" by Delhi Gynae forum north under aegis of AOGD	5:00 pm - 7:00 pm
16	19.08.2021	Master class on "Endoscopic Approach to Surgical Management of Endometrial carcinoma" by Endoscopy Committee & Oncology Subcommittee	6:00 pm - 8:00 pm
17	20.08.2021	"Pregnancy with Thyroid Disease" by Multidisciplinary Subcommittee in association with DGFSW	4:00 pm - 6:00 pm
18	21.08.2021	"Ovarian Cancer" by Oncology Subcommittee	5:00 pm - 7:00 pm
19	23.08.2021	"Antenatal Vaccination & Labour Care" by AOGD	5:00 pm - 7:00 pm
20	26.08.2021	"Infertility Capsule & IUI workshop" by LHMC under the aegis of AOGD	9:00 am - 5:00 pm
21	27.08.2021	NARCHI Pre Congress Workshop on Critical Care Obstetric" under aegis of AOGD	2:00 pm - 5:30 pm

## Forthcoming Events for September 2021

S.No.	Date	Event	Time
1	03.09.2021	AOGD Clinical Meeting at Army Hospital	4:00 pm - 5:00 pm
2	04.09.2021	Public Forum on Vaginal Discharge by WOW India & AOGD	4:00 pm - 5:00 pm
3	05.09.2021	Public Forum: Adolescent Health Awareness by Outreach Team of AOGD	3:00 pm - 4:00 pm
4	08.09.2021	"Bursting the Myths and Realities in RPL" by FOGSI Food, Drugs & Medical Surgical Committee under Aegis of Infertility Subcommittee AOGD.	5:00 pm - 7:30 pm
5	10.09.2021	"Fetal Anomalies Workshop- Meeting the Expectation" by Fetal Medicine and Genetics Subcommittee	3:00 pm - 6:00 pm
6	14.09.2021	"Contraception" by SMLM under Aegis of AOGD	6:00 pm - 8:00 pm
7	15.09.2021	"The Truth about Thyroid" by Viveo under Aegis of Infertility Subcommittee AOGD	5:30 pm - 7:00 pm
8	16.09.2021	"Birthing Experience" by Safe Motherhood Subcommittee	4:30 pm - 7:00 pm
9	17.09.2021	"Decoding the Basics of Prenatal Screening" by QI Subcommittee AOGD & PAN DGF	3:00 pm - 5:00 pm
10	18.09.2021	Webinar on 'PPH' by AOGD	2:00 pm - 4:00 pm
11	20.09.2021	"Postpartum Complications" by Multidisciplinary Subcommittee AOGD, in association with DGFSW	4:00 pm - 6:00 pm
12	23.09.2021	"Safe Laparoscopic Surgery: Simple Solutions to Avoid Complex Problems" by Endoscopy Subcommittee	6:00 pm - 8:00 pm
13	24.09.2021	AOGD monthly clinical meeting at DDU Hospital	4:00 pm - 5:00 pm
14	25.09.2021	"Endometrial Cancer Surgical Treatment and Beyond" by Oncology Subcommittee	3:00 pm - 5:00 pm
15	27.9.2021	Adolescent Counselling on "Nutrition & Menstrual Hygiene" by Rural Health Subcommittee AOGD in Association with WDW & MPH IMA WG in Roadside Schools	2:00 pm - 5:00 pm
16	28.09.2021	Heart Disease in Pregnancy by AOGD & FOGSI Medical Disorder Committee	5:00 pm - 7:00 pm
17	29.09.2021	"Teenage Pregnancy and Anaemia" by AOGD Adolescent Health Subcommittee	5:00 pm - 7:00 pm
18	30.09.2021	"Male Infertility" by FOGSI Sexual Medicine Committee under aegis of Infertility Subcommittee AOGD	6:00 pm - 8:00 pm



## Events held under the aegis of AOGD in August 2021



World Breast Feeding Awareness Week 1<sup>st</sup> to 7<sup>th</sup> August- AOGD Jointly with Agra Society Won of FOGSI North Zone Breastfeeding Week Prize



APJ Abdul Kalam Awards for Excellence - 2021





Best Slogan Award by FOGSI



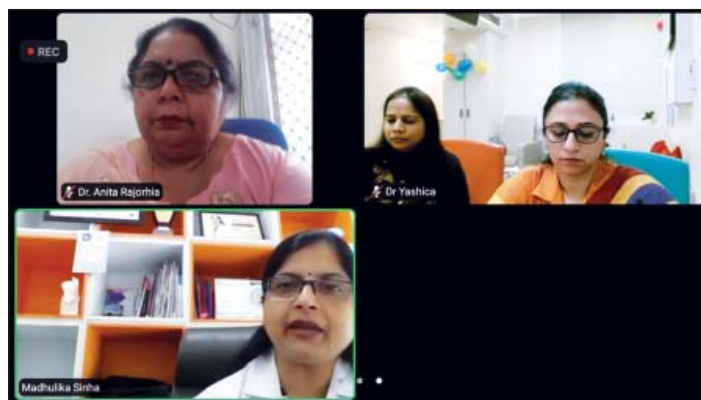
"IVF pregnancies: how are they different"



"Reining in the CS pandemic"



Public Forum, Skit and Pledge on 4<sup>th</sup> August



"Optimizing Normal Delivery & Caesarean"



"Point of Care Quality Improvement Workshop"



"Male Infertility, the most ignored"





"Recurrent Pregnancy Loss"



"Challenges during COVID Pandemic in Population"



"Webinar on Infertility"



"Endoscopic Approach to Surgical Management of Endometrial Carcinoma"



Thalassemia & Other Autosomal Recessive Disorders



"Pregnancy with Thyroid Disease"



CME on "Ovarian Cancer"



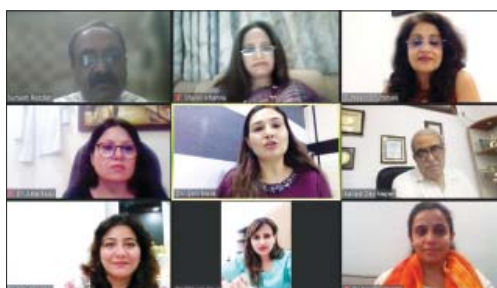
"Antenatal Vaccination & Labour Care"



"Infertility Capsule & IUI workshop"



NARCHI Pre Congress Workshop on Critical Care Obstetric



RPL and luteal phase support in ART cycle



# Journal Scan

Rekha Bharti<sup>1</sup>, Sheeba Marwah<sup>2</sup>

<sup>1</sup>Professor, <sup>2</sup>Associate Professor, Obstetrics & Gynaecology, VMMC & Safdarjung Hospital

## Prevalence and Treatment of Postpartum Stress Urinary Incontinence: A Systematic Review

Alicia L Gonzales, K Lauren Barnes  
Clifford R Qualls, Peter C Jeppson

*Female Pelvic Med Reconstr Surg* 2021 Jan 1;27(1):e139-e145.

**Objectives:** Many women present for treatment of stress urinary incontinence (SUI) after childbirth. This systematic review describes the efficacy of treatment options for SUI initiated during the 12 months after delivery. **Methods:** We conducted a systematic review to identify studies comparing treatment options for SUI initiated in the 12 months after parturition. We searched MEDLINE from inception to February 2019, using Medical Subject Heading terms related to pregnancy and urinary incontinence. Preintervention and postintervention populations were compared using analysis of variance with Fisher least significant difference method used to determine efficacy between groups. Grades for Recommendation, Assessment, Development and Evaluation system was used to categorize quality of evidence as high, moderate, low, or very low. **Results:** We double screened 4548 abstracts, identifying 98 articles for full-text review. Seven studies met the eligibility criteria and were included. Compared with a control group, the 4 interventions identified outperformed the control group ( $P < 0.001$ ) using Fisher (with effect sizes noted): (1) supervised pelvic floor physical therapy (0.76), (2) electrical stimulation (0.77), (3) home physical therapy (PT) (0.44), and (4) surgery (not applicable). Based on Grades for Recommendation, Assessment, Development and Evaluation assessment, there was moderate evidence to support PT and electrical stimulation, with insufficient evidence for surgery. There were no significant differences in parity, age, or body mass index via analysis of variance. The overall strength of evidence is poor for the treatment of postpartum SUI; more data are needed to fully evaluate other treatment options. **Conclusions:** All identified interventions demonstrated greater improvement for postpartum SUI over no treatment. Supervised PT  $\pm$  electrostimulation was the most effective nonsurgical intervention.

## False-negative Finding in Urodynamic Study for the Chief Complaint. Does it interfere with the clinical outcomes for the treatment of SUI or OAB syndromes?

Paulo Rodrigues, Flávio Hering, Eli Cielici  
Marcio D Império

*Int Braz J Urol.* May-Jun 2021;47(3):551-557.

**Purpose:** False-negative urodynamic findings may mislead or prevent planned treatments due to unmatched findings with the clinical presentation. We hypothesized that the absence of urodynamic demonstration of SUI or OAB on urodynamics would interfere with clinical outcomes. **Materials and Methods:** We prospectively studied 124 women with (94) or without (30) demonstrable SUI after sling operations. Similarly, 64 women with OAB syndrome with (38) or without (26) demonstrable DO were also compared after treatment with anticholinergic agents. Patients were assessed with the UDI-6 and IIQ-7 questionnaires 3 and 6 months after treatment. **Results:** Only 76% of SUI patients demonstrated urine leakage during urodynamics. The UDI-6 score was higher in the demonstrable-SUI and demonstrable-DO groups, while the IIQ-7 score was comparable within the incontinence or urgency/frequency groups. Demonstrable and non-demonstrable SUI-operated patients showed similar outcomes. Patients with urgency syndromes with or without demonstrable DO had a similar rate of improvement with anticholinergic therapy. **Conclusions:** Women with clinical complaints of SUI objectively demonstrated on urodynamics presented the same subjective clinical outcome as those with SUI lacking objective demonstration when measured by the UDI-6 and IIQ-7 questionnaires. Similarly, patients with OAB syndrome with or without demonstrable DO had similar clinical improvement when treated with anticholinergics and measured using the same questionnaires.

**Keywords:** Syndrome; Urinary Incontinence; Urodynamics.

## Obstructive Sleep Apnea Syndrome as a Potential Cause of Sexual Dysfunction in Women: Sexual dysfunction in women

Mehmet Kabak, Mahir Akbudak

*Sleep Breath.* 2021 Sep;25(3):1511-1517.

**Background:** Obstructive sleep apnea (OSA) is defined as the cessation of respiration due to recurrent and partial or complete blockade of the upper airways during sleep. Nocturnal hypoxemia due to OSA may accompany these conditions, with significant negative impact on the life quality of patients leading to mental and/or sexual dysfunction. OSA as a cause of sexual dysfunction in women has been subject to very little research. The goal of this study was to examine the effect of OSA on sexual functions in women suffering from this disorder. **Methods:** Patients with OSA were categorized into two groups, those with and those without sexual dysfunction. **Results:** When women with OSA and healthy women were compared, age ( $p < 0.001$ ), body mass index (BMI) ( $p < 0.001$ ), Beck Anxiety Inventory (BAI) ( $p < 0.001$ ), Beck Depression Inventory (BDI) ( $p = 0.001$ ), there was a significant difference in the Arizona Sexual Experience Scale (ASEX), ( $p = 0.02$ ). When women with OSA were compared in terms of sexual dysfunction, a significant difference was found in apnea-hypopnea index (AHI) ( $p = 0.01$ ) and ASEX ( $p < 0.001$ ). There were no significant differences in hormonal parameters between the two groups. **Conclusion:** Sexual dysfunction in females is a largely under-recognized but important condition. Symptoms caused by OSA may include sexual dysfunction which may increase the prevalence of depression and anxiety, further reducing the quality of life.

**Keywords:** Anxiety; Depression; OSA; Sexual dysfunction.

## Metabolic Syndrome in Women with and without Interstitial Cystitis/Bladder Pain Syndrome

Liao Peng, Xing-Peng Di, Shi-Xin He, Xiao Zeng  
Hong Shen, Hui-Li Zhu, De-Yi Luo

*Int Urogynecol J.* 2021 May;32(5):1299-1306.

**Introduction and hypothesis:** The aim of this study was to compare the frequency of metabolic syndrome (MetS) in patients with and without interstitial cystitis/bladder pain syndrome (IC/BPS). **Methods:** This case-control study evaluated the indicators of MetS in 287 females with IC/BPS and in 287 females without IC/BPS in West China Hospital between January 2010 and January 2020. Then, the number of voids per day, frequency of night urination, O'Leary-Sant Interstitial Cystitis Symptom/Problem Index, and visual analog scale were examined in the two groups. **Results:** Based on both the National Cholesterol Education Program Adult Treatment Panel III recommendations and the International Diabetes Federation criteria, the distribution of MetS was statistically higher in patients with IC/BPS than in the control group, with 34.8% vs 17.8% ( $P < 0.0001$ ) and 34.2% vs 20.9% ( $P = 0.0005$ ), respectively. Regarding symptom scores, the IC/BPS group demonstrated significantly higher scores than the control group in all aspects ( $P < 0.0001$ ). More patients with anxiety ( $P < 0.0001$ ), insomnia ( $P < 0.0001$ ), hypertension ( $P = 0.0001$ ), and diabetes mellitus ( $P = 0.017$ ) were observed in the IC/BPS group. Moreover, the findings indicated that patients with IC/BPS had a higher BMI ( $P = 0.0001$ ) and larger waist circumference ( $P = 0.0001$ ). Blood tests presented a significantly higher level of fasting glycemia, serum cystatin-C, and triglycerides in patients with IC/BPS. Furthermore, higher ORs for the occurrence of MetS among cases were observed, although this was not statistically significant. **Conclusions:** MetS frequency was relatively high in patients with IC/BPS. Further research is needed to understand the common pathophysiologic mechanism of IC/BPS and MetS.

**Keywords:** Body mass index; Interstitial cystitis/bladder pain syndrome; Metabolic syndrome; Obesity.

# Proceedings of Virtual AOGD Monthly Clinical Meeting held at Army Hospital Research and Referral on 3<sup>rd</sup> September, 2021

## Serodiscordancy not a Deterrent to Childbearing: Safe Parenthood an Attainable Reality

**Lt Col Prashant Sharma, Surg. Cdr Hrishikesh Magdum**

A Couple, Husband 35 yrs and Wife 31 yrs old, married for 04 yrs with cohabitation of 02 yrs presented as a case of primary infertility. Menstrual cycles were 3-4days/ 30-45 days. No history of using any form of contraception. Female partner evaluation revealed a BMI of 25.80 kg/m<sup>2</sup>, Transvaginal USG- B/L PCO, HSG- B/L patent tubes, FSH- 3.49 mIU/ml, LH- 6.18 mIU/ml, Prolactin- 22 ng/ml, TSH- 1.8 mIU/L and AMH- 6.9 ng/ml, HIV- negative. Male partner evaluation- Semen analysis: volume- 2 ml, sperm concentration- 12 million/ml, motility- 30%, HIV- positive, CD4 leucocytes- 300 cells/ ml and HIV Viral Load- 450 copies/ml. Husband put on HAART with triple drug regimen and re-evaluated at 6 months interval. After one year the viral load was undetectable with CD4 leucocytes- 450 cells/ ml.

Lady was reassessed on Day 2 of her menstrual cycle and was started on antagonist protocol with agonist trigger. 16 oocytes were retrieved. ICSI was done and cultured up to day 5. 09 blasts formed and were frozen using Cryo Bio System device in a separate container. FET with 02 Embryos was done and a single intrauterine pregnancy was achieved. Pregnancy was uneventful and she delivered 2.8 Kg male baby at 38+2 weeks POG. Lady was checked in each trimester and after 3 months of delivery. Both the mother and baby tested negative.

Male viral loads of <200 copies/mL for the preceding 6-month period are generally considered acceptable for ART. Preexposure Prophylaxis (PrEP) administered to the female partner have been shown to minimize risk to the female partner. Discontinuous Density Gradient (90%-45%) centrifugation followed by 2 semen washing steps followed by swim-up is recommended for semen preparation. Data on the use of IVF with ICSI for preventing HIV transmission to uninfected women

are promising. For Embryo storage- use of “double bagging” or sealing techniques to prevent the direct contact of cryocontainers with liquid nitrogen is recommended.

## Chronic Uterine Inversion - A Diagnostic Dilemma

**Maj Pranjali Dwivedi, Lt Col Vinod Kumar**

A 39 years P3L3 lady presented with complains of excessive bleeding per vaginum with recurrent episodes of urine retention and feeling of a mass extruding from vagina for past two months. She had a normal delivery on 12<sup>th</sup> November 2020 and her complaint started in the immediate post partum period. In this Index pregnancy, antenatal period was uneventful besides a 10 x 14 cms subserosal fundal fibroid in anomaly scan. For GDM and IHCP, she was induced and had a normal delivery. On examination she had pallor with tachycardia. Per Abdomen a soft, non tender 20 week sized mobile abdominopelvic mass was felt. A 5 x 6 cms soft, congested, edematous mass was coming from cervix and an irregular uterine contour was felt. MRI confirmed a 9 x 10 x 10 cms heterogeneous lesion in the vaginal and cervical canal raising the possibility of an inverted uterus along with a pedunculated fundal fibroid of 9.6 x 12.9 x 9.8 cms. She was taken up for laparoscopy with a provisional diagnosis of chronic inversion of uterus secondary to a large fundal fibroid. Intraoperatively, a dimple like depression was noted at the fundus, a large pedunculated fibroid was seen attached near left cornual, bilateral round ligaments and fallopian tubes were going into the dimple. Fundal fibroid was detached and a Haultain's incision was given on the posterior uterine wall. Uterine inversion correction with vaginal manipulation was not successful as the tissues were extremely fragile, edematous and were not yielding even after incising the constriction ring and the vaginal end was bleeding profusely. The procedure was converted to laparotomy and hysterectomy with B/L salpingectomy was done. Post operative recovery was uneventful.

## Changing Indications of Prenatal Diagnosis

**Maj Ashisha, Col Reema Kumar**

Series of cases, where early interventions helped in arriving at diagnosis and also prognosticating future pregnancies were presented. First case was a Rh positive multigravida with USG features suggestive of Non Immune Hydrops with raised MCA PSV at 30 weeks. Fetal Echo was done ruled out any underlying cardiovascular cause. Cordocentesis was done and sent for Infection screen, Rh minor blood group antigen and Qf PCR, CMA and Clinical exome gene sequencing. Exome sequencing result clinched diagnosis of Baarth syndrome, X linked disorder which can affect 50% males and females can be carriers.

The second case was multigravida, third degree consanguineous marriage with Anomaly scan at 18 weeks s/o Post axial Polydactyly and B/L

hyperechogenic Kidneys. She had a previous normal delivery with a female child affected with hyperechogenic kidneys and polydactyly in all four limbs. No antenatal evaluation carried out in previous pregnancy. In view of two offsprings affected and suspicion of ciliopathy, clinical exome sequencing was done for this fetus and affected sibling. Result showed diagnosis of Bardet Biedel syndrome, AR disorder with 25% risk of inheritance recurrence in next pregnancy.

The last case was a multigravida, non-consanguineous marriage with USG features s/o B/L severe Lateral ventriculomegaly. She had a previous male child with Hydrocephalus, detected postnatally. In view of two offsprings being affected and male phenotype, Amniocentesis was done for target gene sequencing and report was positive for L1CAM gene mutation with X linked hydrocephalus with stenosis of aqueduct of Sylvius.

# Quiz Held at Monthly Clinical Meeting

**Rekha Bharti<sup>1</sup>, Sheeba Marwah<sup>2</sup>**

<sup>1</sup>Professor, <sup>2</sup>Associate Professor, Obstetrics & Gynaecology, VMMC & Safdarjung Hospital

- 1. Distance between the umbilicus and aortic bifurcation in obese women is**
    - a. 1.5 cm
    - b. 2.9 cm
    - c. 3.5 cm
    - d. None of the above
  - 2. Lifting the abdominal wall during Veress insertion is associated**
    - a. Higher rate of failed entry
    - b. Higher rate of successful entry
    - c. Higher rate of intraabdominal injury
    - d. None of the above
  - 3. The size of port used in robotic surgery is**
    - a. 10 mm
    - b. 8 mm
    - c. 5 mm
    - d. 4mm
  - 4. In hysteroscopy pressure gradient to maintain uterine distension is**
    - a. 10-25 mmHg
    - b. 30-40 mmHg
    - c. 60 to 70 mmHg
    - d. 100-120 mm Hg
  - 5. Factor leading to subcutaneous emphysema**
    - a. High gas pressure settings
    - b. Intraabdominal pressure  $\geq 15$  mm Hg
    - c. Multiple attempts at abdominal entry
    - d. All of the above
- | Answers |         |         |
|---------|---------|---------|
| Q. 1- b | Q. 2- a | Q. 3- b |
| Q. 4- c | Q. 5- d |         |

## Winners of the Monthly Clinical Meeting Quiz September Issue 2021



**Dr Kanika Chopra**

Assistant Professor,  
Department of Obstetrics and  
Gynecology, Lady Hardinge  
Medical College



**Dr Priyanka Singh**

Senior Resident, D Y Patil  
Medical College, Navi Mumbai



**Dr Yukti Bhardwaj**

DNB (BPSGMC) Obstetrics &  
Gynaecology, Senior Resident,  
VMMC & Safdarjung Hospital



# 43<sup>rd</sup> Annual AOGD Conference

19 20 21 NOVEMBER, 2021

## SCIENTIFIC PROGRAM HIGHLIGHTS

### ERAS in Obstetrics

#### Labour - Newer Perspective

Labour Care Guide, Respectful Maternity Care, Reaching SDG goal by Preventing PPH

#### Too Small & Too Soon-The Rescue Toolbox

Imaging in FGR, Preterm Labour - Prediction & Prevention, Kangaroo Mother Care

#### On the Edge: Obstetric Conditions

Acute Kidney Injury, Acute Renal Failure, Dyspnea in Pregnancy

#### Hypertensive Disorders in Pregnancy

Prediction & Management of Pre-Eclampsia & its Complications

#### Decoding Fetal Medicine

Prenatal Screening, Prenatal Surgical Management, Pyelectasis

#### Infection in Ob/Gyn-Bundle Approach

Sepsis in Pregnancy, Surgical Site Infections

#### Nurture the Special Pregnancy

Pregnancy Following IVF, Recurrent Pregnancy Loss, Uterine Surgery

#### Diabetes in Pregnancy-Solving the Conundrum

Insulin Therapy, Intranatal & Post-Natal Management, Controversies

#### Mixed Bag

Antenatal Vaccination, Thrombocytopenia, Surgical Management of Cardiac Ailments

#### Chronic Pelvic Pain & PID

Overview, Medical & Surgical Management

#### Family Welfare

Dilemmas in Termination of Pregnancy for Maternal Medical Disorders

#### Recent Advances in Gyn-Oncology

FIGO Vulval Staging, Ovarian Cancer-Early Diagnosis, Endometrial Cancer Management

#### Urogynaecology

Perineal Injuries /OASIS, Prolapse Prevention, Urinary Incontinence, Laser in urogynecology

#### Optimizing Fertility Outcome in

Genital Tuberculosis, Endometriosis, Cancer Survivors, POI

#### Demystifying Mullerian Anomalies

Diagnosis to Management

#### Menopause Update



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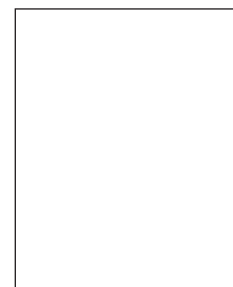
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