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Interstitial Cystitis and Bladder Pain Syndrome: A Multidisciplinary Approach Integrating Gynecology and Urology

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Abstract: Interstitial Cystitis/Bladder Pain Syndrome (IC/BPS) is a debilitating chronic illness that is associated with pelvic pains, urinary symptoms, and a high comorbidity burden, making it difficult to diagnose and treat. This paper was intended to describe a group of IC/BPS patients treated in a special multidisciplinary clinic with a combination of gynecology and urology and assess clinical outcomes and customer satisfaction. Furthermore, a cross-sectional study was carried out on 107 patients with IC/BPS who were diagnosed with this condition at a multidisciplinary clinic. The impact of symptoms in patients was measured at baseline with the help of validated scales (VAS, USS, ICSI, and ICPI). The effectiveness of treatment and patient satisfaction of multidisciplinary approach were measured at the 12-month follow-up. It was a cohort with a high symptom burden (pelvic pain 91.6 percent, urinary frequency 83.2 percent, and high comorbidity, depression/anxiety, 38.3 percent, and endometriosis 31.8 percent). Most (70.1) were taking oral medications, physical therapy (43.9), and intravesical instillations (35.5) were also used. At baseline, the mean pain VAS was 7.2±1.8. Follow-up results showed that at 12 months of multidisciplinary therapy, 67.3% of patients were reported to have improved in their symptoms, and 83.2% were reported to have been satisfied or very satisfied with the integrated care method. High symptoms and patient satisfaction rates are linked to a multidisciplinary approach and active incorporation of urological and gynecological knowledge, and make it an effective and patient-centered approach to treating this difficult condition. This enhances the general use of integrated, specialty-based clinics using collaborations in the IC/BPS.

Keywords: Interstitial Cystitis, Symptoms, Hospitalization Outcomes, and Satisfaction Status

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1. Introduction

Interstitial cystitis/bladder pain syndrome (IC/BPS) is a long-lasting and disabling urological disorder that is typified by unidentified pelvic pain, urinary urgency, frequency, and nocturia [1,2]. This is a disease mainly of the female sex, and it is estimated that 90 percent of all the diagnosed cases are of the female sex, although there are cases of men and children who also have the disorder [3]. Due to the differences in symptomatology and a lack of a set of diagnostic biomarkers, both diagnosis and treatment are highly challenging [4].

IC/BPS clinical presentation frequently is similar to other disorders of the pelvic area, including endometriosis, overactive bladder (OAB), chronic pelvic pain syndrome (CPPS), and vulvodynia, which results in incorrect diagnosis or a delayed response to treatment. The patients suffer years of pain and go through several tests with specialists without success [5,6].

The existing paradigm of treating IC/BPS is still highly empirical, as it aims at the relief of symptoms, but not treatment. Therapeutic interventions can vary in terms of conservative (dietary, physical therapy, and behavioral interventions) or pharmacological (oral medications, intravesical instillations) and invasive (hydrodistention, neuromodulation, or cystectomy in the refractory cases) therapies [7, 8, 9]. Nevertheless, the effect that these interventions have on patients is extremely uneven, with some of them only responding partially or temporarily to the interventions [10].

Due to the complex nature of the interaction between urological and gynecological pathologies in IC/BPS, a multidisciplinary management approach that incorporates all these aspects is necessary to achieve maximum patient outcomes [11]. The cooperation between urologists, gynecologists, pain specialists, physical therapists, and psychologists will help to approach a more complex assessment and offer a more specific treatment plan [12]. Moreover, physical therapy of the pelvic floor has been demonstrated to reduce the symptoms of patients with myofascial dysfunction, whereas hormonal regulation can be considered useful in patients with estrogen-sensitive bladder mucosa. Psychological care is also essential since, in most cases, the chronic pain causes anxiety, depression, and low quality of life [13]. The holistic model of treating the biological, psychological, and social aspects of IC/BPS can contribute to the therapeutic efficacy to a significant extent [14].

2. Materials and Methods

The aim of the cross-sectional study was to assess the execution and the results of a multidisciplinary pathway, which is structured and includes the joint efforts of both urology and gynecology to provide care to patients with at least interstitial cystitis/bladder pain syndrome (IC/BPS). The sample size of the study was 107 female patients diagnosed with IC/BPS and referred to a specialized clinic dealing with pelvic pain between January 2024 and January 2025. Besides, the mean distribution of age among the cohort included adult decades (21.5% ≤ 30 , 48.6% 31-50, 29.9% ≥ 51) and a variety of BMI classes.

All the patients were systematically assessed using the multidisciplinary pathway upon diagnosis. Primary evaluation was a standardized clinical history, physical assessment, and patient-reported outcome measures (PROM) of the Visual Analog Scale (VAS) of pain, Urgency Severity Scale (USS), and the O'Leary-Sant IC Symptom and Problem Indices (ICSI/ICPI). Diagnostic work up consisted of cystoscopy with hydrodistention under anesthesia to group findings (Hunner lesions, glomerulations, or normal) and urodynamic to assess bladder functioning and capacity. A specific gynecological examination was done to identify and document the underlying disorders of pelvic pain that included endometriosis, vulvodynia, and dyspareunia. Based on the combined findings of the urologic and gynecological results, the multimodal arsenal of treatments was created and evolved into an individualized regimen of treatment. This involved the first-line oral treatments (e.g., amitriptyline), physical therapy of the pelvic floor to correct the related myofascial dysfunction, and pelvic instillations. In patients experiencing refractory symptoms or certain gynecological pathologies (e.g., known endometriosis), more intricate treatment procedures such as sacral neuromodulation or gynecological surgical treatment were taken into consideration. The integrated model was manifested through the referral pattern, according to which 28.0 percent of the patients had both specialties consulted simultaneously at the beginning.

Regarding data collection and outcome measures, baseline demographic, clinical, and PROM data was collected during the first visit. The main result was global symptom improvement as reported by patients at 12 months follow-up, which was classified as improved, no difference, and worsened. The secondary outcomes were changes in the baseline and overall patient satisfaction with the multidisciplinary care model and specific PROM scores. Medical records were used to extract the data.

Besides, the demographic and clinical characteristics were summarized using descriptive statistics, including frequencies and percentages of categorical variables and mean and standard deviation of continuous variables. Paired t-tests or Wilcoxon signed-rank tests (depending on the type of analysis) were used to compare the pre- and post-

intervention PROM scores, where the p-value was below 0.05 and was deemed as statistically significant. SPSS version 24.0 was used in all the analyses.

3. Results

Table 1. Enroll the clinical and demographic data of 107 women patients.

Categories	Parameters	N (%)
Age (years)	≤30	23 (21.5%)
	31–50	52 (48.6%)
	≥51	32 (29.9%)
Sex	Female	107 (100%)
BMI classifications, [kg/m ²]	Underweight (<18.5)	5 (4.7%)
	Normal (18.5–24.9)	57 (53.3%)
	Overweight (25–29.9)	31 (29.0%)
	Obese (≥30)	14 (13.1%)

Table 1. summarizes the demographic and clinical characteristics of the 107 female patients included in the study. Nearly half of the participants were aged 31–50 years (48.6%), while 21.5% were aged 30 years or younger and 29.9% were 51 years or older. All enrolled patients were female. According to body mass index (BMI) classification, the majority of patients had a normal BMI (53.3%), followed by overweight (29.0%) and obese individuals (13.1%). Underweight patients accounted for 4.7% of the study population.

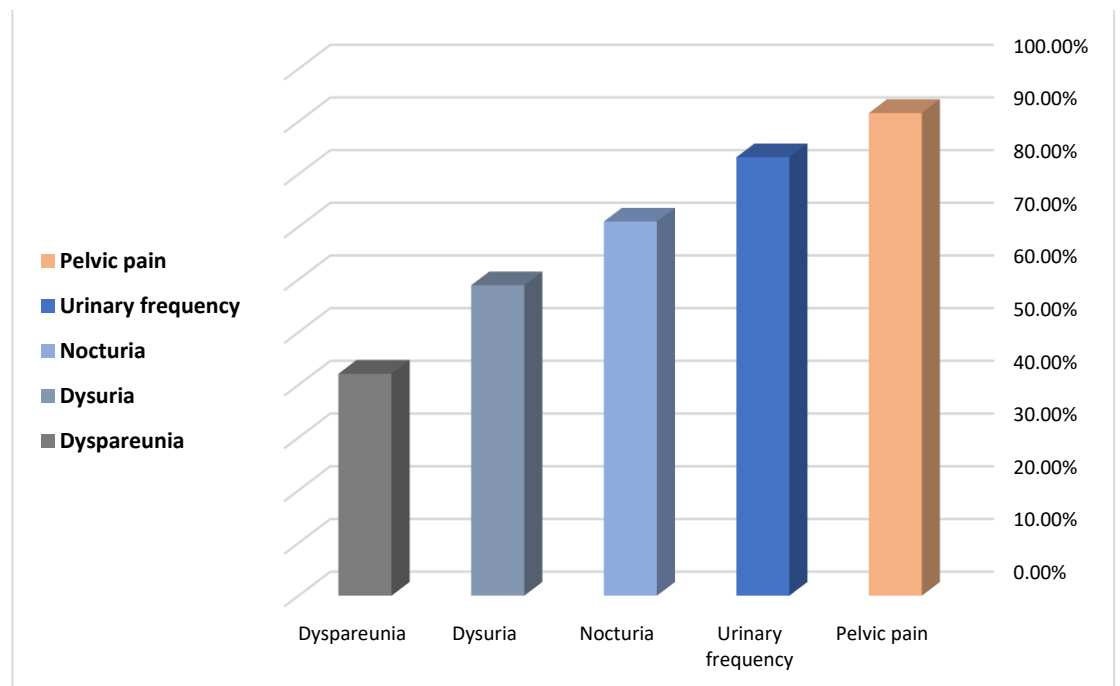


Figure 1. Distribution of notable clinical symptoms in female patients diagnosed with interstitial cystitis and bladder pain syndrome.

Figure 1. illustrates the distribution of major clinical symptoms among female patients diagnosed with interstitial cystitis/bladder pain syndrome. Pelvic pain was the most frequently reported symptom, affecting nearly 90% of patients, followed by urinary frequency (approximately 80%) and nocturia (around 65%). Dysuria was reported by about half of the patients, while dyspareunia was the least common symptom, observed in roughly 40% of cases.

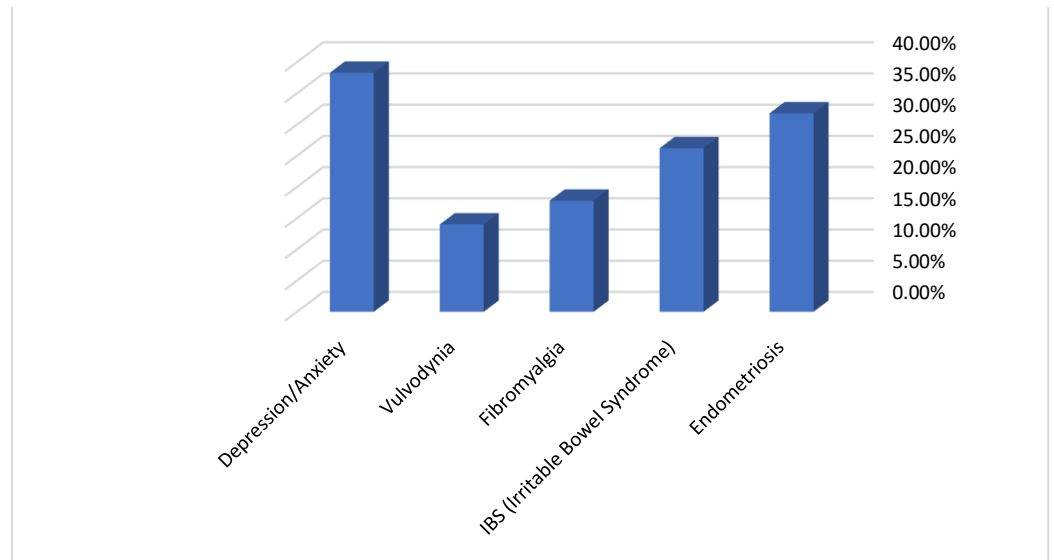


Figure 2. Distribution of the mechanisms causing IC or BPS related to patients who participated in this study.

Figure 2. presents the distribution of comorbid conditions associated with interstitial cystitis/bladder pain syndrome among the study participants. Depression and anxiety were the most commonly reported conditions, affecting approximately 38% of patients. Endometriosis was observed in about 32% of cases, followed by irritable bowel syndrome (IBS) in nearly 25%. Fibromyalgia and vulvodynia were less frequent, reported in approximately 18% and 13% of patients, respectively.

Table 2. Determining the diagnostics outcomes in cystoscopy and hydrodistention.

Variables	N [%]
Hunner’s lesions	24 (22.4%)
Presence of Glomerulations	68 (63.6%)
Normal findings	15 (14.0%)

Table 2. summarizes the cystoscopic and hydrodistention findings among the 107 patients with interstitial cystitis/bladder pain syndrome. Glomerulations were the most frequently observed finding, present in 63.6% of patients. Hunner’s lesions were identified in 22.4% of cases, while normal cystoscopic findings were reported in 14.0% of the study population.

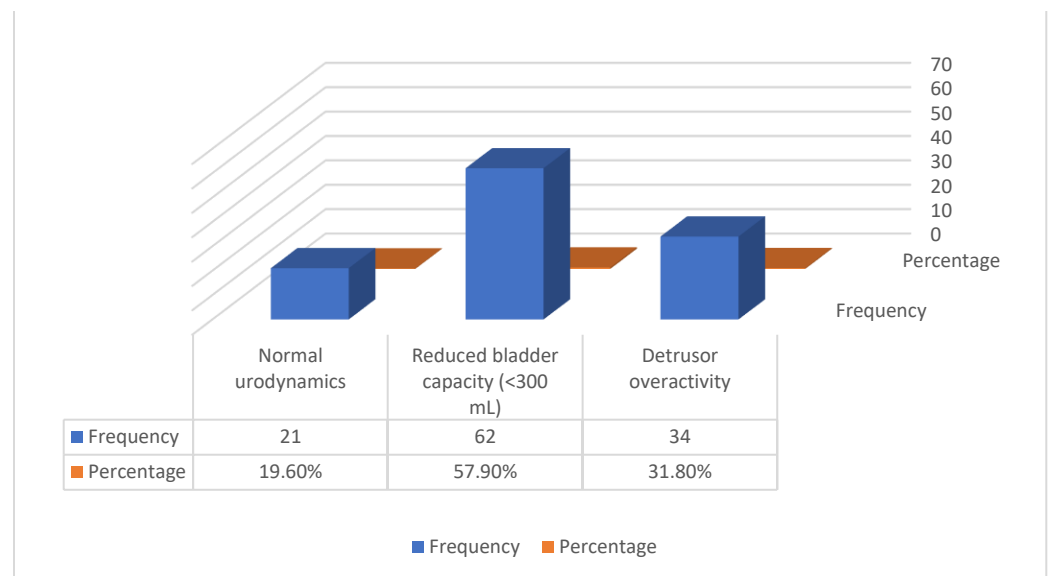


Figure 3. Establishing the clinical outcomes of urodynamic into 107 patients.

Figure 3. illustrates the urodynamic findings among the 107 patients included in the study. Reduced bladder capacity (<300 mL) was the most common abnormality, observed in 57.9% of patients. Detrusor overactivity was identified in 31.8% of cases, while normal urodynamic findings were reported in 19.6% of the study population.

Table 3. Classifying the interventions performed on the patients.

Therapies	Frequency	Percentage
Amitriptyline	47	43.9%
Intravesical instillations	75	70.1%
Sacral neuromodulation	38	35.5%
Physical therapy	12	11.2%

Table 3. outlines the therapeutic interventions applied to patients with interstitial cystitis/bladder pain syndrome. Oral pharmacological treatment, particularly amitriptyline, was administered to 43.9% of patients. Intravesical instillations were the most frequently used intervention, applied in 70.1% of cases. More advanced treatments included sacral neuromodulation in 35.5% of patients, while pelvic floor physical therapy was utilized in 11.2% of the study population.

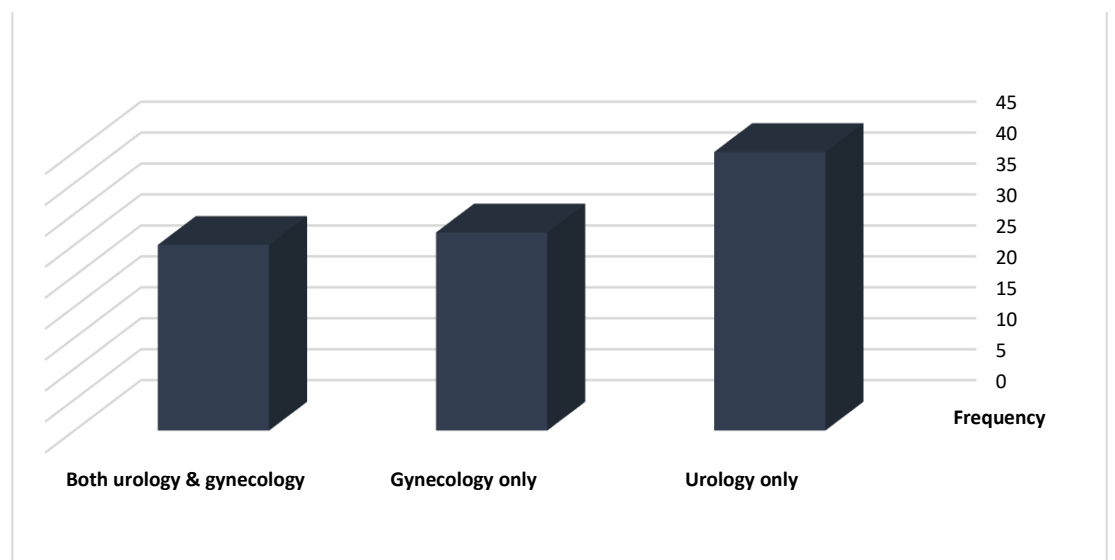


Figure 4. Enroll the hospital outcomes referral sections of 107 patients.

Figure 4. shows the distribution of referral patterns among the 107 patients included in the study. The majority of patients were managed by urology alone, accounting for approximately 42% of cases. Gynecology-only management was observed in about 30% of patients, while 28% of patients required joint evaluation and management by both urology and gynecology services.

Table 4. Assessment of the reported symptoms outcomes at baseline and post-intervention.

Items	At baseline	At post – intervention
Pain (VAS)	7.2 (\pm 1.8)	2.4 (\pm 1.1)
Urgency (USS)	4.1 (\pm 1.1)	1.3 (\pm 0.3)
IC Symptom Index (ICSI)	14.5 (\pm 3.9)	4.3 (\pm 1.6)
IC Problem Index (ICPI)	13.8 (\pm 4.2)	3.3 (\pm 2.4)

Table 4. compares patient-reported symptom scores at baseline and after the multidisciplinary intervention. Marked improvements were observed across all measured outcomes. Mean pain intensity (VAS) decreased from 7.2 ± 1.8 to 2.4 ± 1.1 , while urgency

scores (USS) were reduced from 4.1 ± 1.1 to 1.3 ± 0.3 . Similarly, substantial reductions were noted in both the IC Symptom Index (ICSI) and IC Problem Index (ICPI), indicating significant overall symptom relief following treatment.

Table 5. Evaluation of the main therapy response throughout symptom improvements.

Items	Prevalence of patients	Percentage, %
Symptom improvement	72 (67.3%)	(67.3%)
No change	25 (23.4%)	23.4%)
Worsening symptoms	10 (9.3%)	(9.3%)

Table 5. presents the overall therapeutic response based on patient-reported symptom changes during follow-up. The majority of patients (67.3%) reported improvement in their symptoms following treatment. No change in symptoms was observed in 23.4% of patients, while 9.3% experienced worsening of symptoms. These findings indicate a generally favorable response to the applied therapeutic strategies.

Table 6. Identifying the outcomes of satisfaction rate in the patients after intervention.

Satisfaction Levels	Number (%)
Very satisfied	51 (47.7%)
Satisfied	38 (35.5%)
Neutral	12 (11.2%)
Dissatisfied	6 (5.6%)

Table 6. summarizes patient satisfaction levels following the multidisciplinary intervention. Nearly half of the patients (47.7%) reported being very satisfied, while 35.5% were satisfied with the received care. Neutral satisfaction was reported by 11.2% of patients, and only a small proportion (5.6%) expressed dissatisfaction. Overall, the findings indicate a high level of patient satisfaction with the treatment approach.

4. Discussion

The findings presented in this study of 107 women with interstitial cystitis/bladder pain syndrome (IC/BPS) indicate the complexity of the disorder and the significance of a multidisciplinary approach to dealing with the disorder through a combination of urology and gynecology. We have data of a patient profile that is similar to some of the USA studies, which reported a high symptom burden, especially in pelvic pain (91.6) and urinary frequency (83.2) in mostly middle-aged females (48.6% aged 31–50) [15, 16, 17]. Comorbid conditions, such as endometriosis (31.8%), irritable bowel syndrome (26.2%), and fibromyalgia (17.8%), are very significant and in accordance with the established overlap of chronic pain syndromes, which also supports the idea of central sensitization as a major pathophysiological process in IC/BPS [18].

Although the lesions of Hunner were present in 22.4% of them, glomerulations (63.6) or even normal results were observed in most of them (14.0). On the same note, urodynamic assessments have been carried out in Canada, Japan, and Wales [19, 20, 21], with detrusor overactivity of 31.8% and a decrease in bladder capacity of 57.9%, but normal results of 19.6%.

Moreover, the intensive use of oral drugs (70.1%), mostly neuromodulators, such as amitriptyline, as well as physical therapy (43.9%), is indicative of the first-line interventions aimed at neuropathic pain management and dysfunction of the pelvic floor. A tiered approach to treatment was demonstrated by the use of intravesical instillations (35.5-11.2) and sacral neuromodulation (11.2) on more refractory cases. Another significant percentage of patients was treated by urology alone (42.1%), gynecology alone (29.9%), and 28.0% needed to be consulted by both. This trend helped to explain that although the symptoms of some patients can be largely categorized in one domain, a considerable number of patients have overlapping gynecologic (e.g., dyspareunia, endometriosis) and urologic pathologies, which should be treated simultaneously [22, 23, 24, 25].

At a baseline, patient-reported outcomes were confirmed as severely affected by symptoms with a mean pain VAS of 7.2 and significant IC symptom and problem indices. A multidisciplinary approach, coordinated as the management, resulted in the 12-month follow-up, which was implicit in that 67.3% of patients were said to have improved their symptoms. This enhancement and high patient satisfaction (83.2% very satisfied or satisfied) were strongly correlated, which confirmed the importance of an integrated model to patients [26, 27].

5. Conclusion

The almost exclusively female group exhibited a variety of cystoscopic appearances, the most frequent being glomerules, and the urodynamic anomaly, especially low bladder capacity, was widespread. Most of the patients needed multimodal management, of which oral drugs and physical therapy were the most common. With a multidisciplinary approach, a significant percentage of patients (more than two-thirds) reported improvement of symptoms over 12 months, and a high degree of patient satisfaction was reported. These findings indicate that a multidisciplinary (gynecology and urology) approach to the assessment and treatment of IC/BPS is essential in order to improve patient outcomes and deal with the multifactorial nature of this condition.

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