Review Article

Quality of Life of Patients with Interstitial Cystitis: A Systematic Review

ABSTRACT

Background: Interstitial cystitis/bladder pain syndrome (IC/BPS) is a severe, long-term disorder characterized by persistent pelvic discomfort, frequent urination, and urine urgency. It is well-known to be linked to reduced productivity at work, emotional disturbances, sleep problems and mobility issues.

Aim: To evaluate the quality of life (QoL) in patients with interstitial cystitis and the strategies used to improve it.

Methods: This is an updated systematic review of studies evaluating the quality of life (QoL) in patients with interstitial cystitis and the strategies for improving it between 2014 and 2022. The PubMed and Google scholar databases were used to explore studies regarding our subject. Original research reporting medical therapies used to evaluate the quality of life (QoL) in patients with interstitial cystitis and the strategies for improving it. Full-text publications served as the inclusion criterion.

Results: Though 100 articles were obtained, only eight met the inclusion criteria. Two studies were cross-sectional, while three studies were retrospective.. The studies included more than 4814 patients with IC/BPS.

Conclusion: IC/BPS was prevalent in women. IC/BPS has a great influence on the quality of life of patients. The top three symptoms of the IC/BPS patients were pain/discomfort, frequency and urgency, and anxiety/depression. . Treatment with Hyaluronic acid (HA) plus chondroitin sulfate (CS) appears to be as effective as Dimethyl sulfoxide (DMSO) with a potentially more favorable safety profile..

Keywords: Quality of Life, QoL, Patients, Interstitial Cystitis, pain and IC/BPS.

INTRODUCTION

Interstitial cystitis/bladder pain syndrome (IC/BPS) is a severe, long-term condition marked by persistent pelvic discomfort, frequent urination, and urgency in the absence of other clear-cut pathologies such as a urinary tract infection or cancer. It is commonly documented that IC/BPS affects mobility, sleep, sexual function, and emotional changes, lowering work productivity. [1] Urinary urgency, frequency, and pain are possible symptoms, which are frequently accompanied by other symptoms thought to be related to the bladder. [2] Numerous comorbid conditions affect many IC/BPS patients inside and outside the pelvic region. [3] For instance, patients with IC/BPS may also experience several co-occurring symptoms and conditions, such as endometriosis, IBS, fibromyalgia, rheumatoid arthritis, and even asthma. [4]

In people who are susceptible to disorders like IC/BPS, as well as in otherwise healthy people, chronic stress can raise the likelihood of disease/pathology and cause hyperalgesia or pain. More than half of IC/BPS patients experience frequent urination and daily or chronic pain, both of which are made worse by stressful situations. [5,6] There is currently no known treatment that is sufficiently effective, and evidence-based treatment guidelines recommend that all patients receive first-line therapy, which includes patient education, behavior modification, and stress management. [7]

Quality of life (QoL) continues to be difficult to define, making its evaluation difficult. Most authors would concur that quality of life (QoL) is a qualitative assessment of the subject's overall health. [8] A comprehensive definition of quality of life (QoL) must consider individual objectives and expectations, the existence of living situations, and one's happiness with those conditions. [9]

The World Health Organization (WHO) developed a 100-question metric that assessed six domains: physical health, psychological health, levels of independence in daily living and work,

social relationships, and environment. This was done to develop a thorough and quantitative assessment of the quality of life (QoL). It should be noted that physical QoL also evaluated rest and sleep, pain and discomfort, general energy levels, and weariness. Improving one's self-image and overall look, negative and positive emotions, general self-esteem, and the capacity for learning, memorization, and concentration were all aspects of mental quality of life. [10] The current systematic review aims to evaluate the quality of life (QoL) in patients with interstitial cystitis and the strategies for improving it.

METHOD AND SEARCH STRATEGY

This systematic review complies with the PRISMA checklist guidelines for systematic reviews and meta-analyses [11]. Google Scholar and PubMed were the two databases that were searched. The two databases were utilized to survey for studies on our main topic, evaluate the quality of life (QoL) in patients with interstitial cystitis and the strategies of improving it". The studies were published between 2014 and 2022.

The searching process involved using different keywords, including “Quality of Life, QoL, Patients, Interstitial Cystitis and IC/BPS” In addition, the involved keywords were employed to collect all relevant articles. This initial exploration resulted in the revision of all titles.

ELIGIBILITY CRITERIA

Only papers focusing on evaluating the quality of life (QoL) in patients with interstitial cystitis and the strategies for improving it were included after reviewing the titles of evaluating the quality of life (QoL) in patients with interstitial cystitis and the strategies of improving it before 2014 were excluded. The second phase involved selecting only original, English-language studies to evaluate the quality of life (QoL) in patients with interstitial cystitis and the strategies for improving it after evaluating the abstracts of the remaining articles. On the other hand, review articles, editor letters, and case reports were not included. The final stage included original English-language articles that discussed and evaluated the quality of life (QoL) in patients with interstitial cystitis and the strategies for improving it. These articles were further examined to exclude duplicates, non-full-text articles, and articles with unsatisfactory content, such as overlapped or incomplete data. Figure 1 displays a detailed explanation of the search approach.

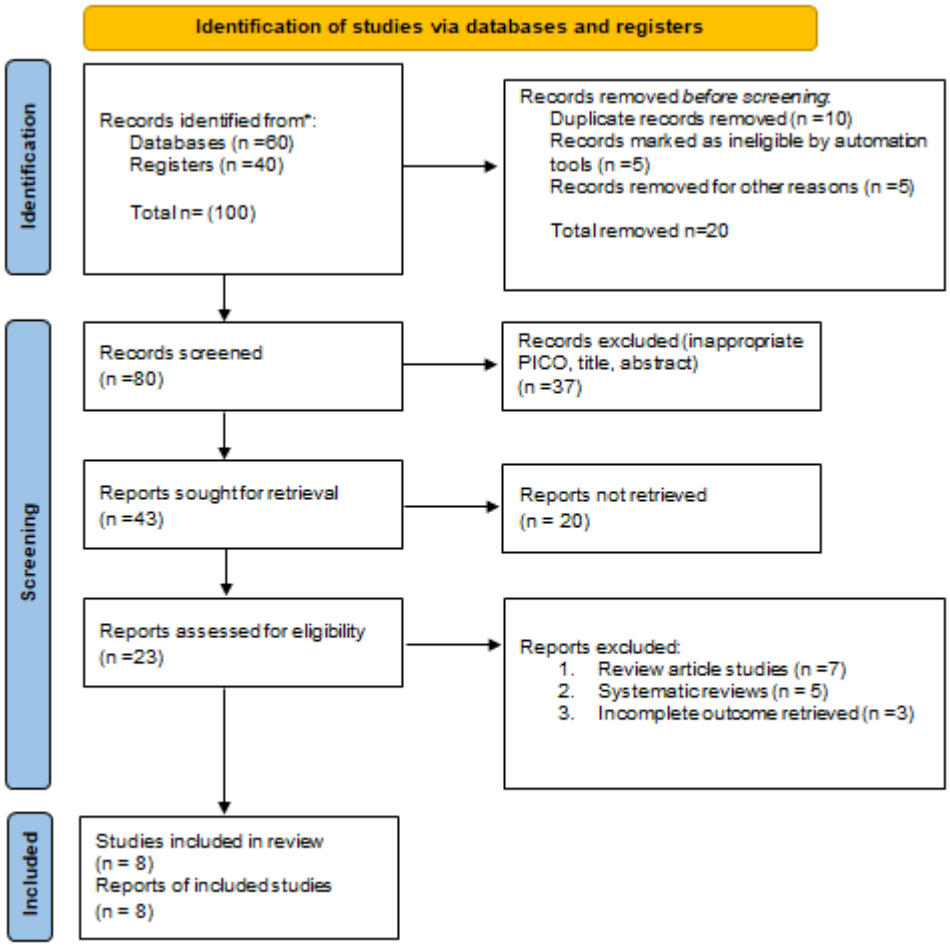

Fig1: Planning of Eligible criteria

DATA REVIEWING AND ANALYSIS

The full text and abstracts of the articles were evaluated to extract the relevant data and transfer it to a pre-made excel sheet. The chosen data were then amended in the excel sheet, and the data were combined to summarize the data to facilitate data analysis.

RESULTS

Eight studies met the eligibility criteria for this systematic review [12-19] (table 1). The included studies were either published in 2014 [16], 2017 [17], 2018[19], 2019 [18], 2021 [13, 14, and 15], and 2022 [12]. Two studies were cross-sectional [12, 14], while three were retrospective [15, 16, and 18]. The results included one prospective randomized study [13] and two clinical trials [14 and 17]. The studies included more than 4814 patients with IC/BPS. Six studies involved women with IC/BPS [13, 15, 16, 17, 18, and 19]. The participants mentioned in one study were over 18 years old [18].

Two studies explored the related factors affecting the quality of life of IC/BPS patients [12, 15]. In contrast, one study investigated the effect of a clinical diagnosis of interstitial cystitis (IC) or bladder pain syndrome (BPS) on health-related quality of life (HRQOL) [14]. Another study [15] described the kind of sleep disturbances and their effects on women with interstitial cystitis/bladder pain syndrome (IC/BPS), while one more study [18] examined the quality of life, sexual function, and body image in female IC/BPS patients who underwent cystectomy. Another study [13] demonstrated the benefits of using pelvic-floor muscle training with biofeedback (BFB) as an additional treatment for females with bladder pain syndrome/interstitial cystitis (BPS/IC). Two last studies studied the safety and efficacy of the management strategies of IC/BPS, one of them compared the efficacy, safety, and costs of intravesical HA/CS to dimethyl sulfoxide (DMSO) [17], while the other determined the efficacy and safety of trigonal injections of onabotulinumtoxinA in patients with bladder pain syndrome/interstitial cystitis [19].

Regarding the factors of health-related quality of life (HRQoL), four studies found that IC/BPS greatly influences patients' quality of life [12, 15, 16, and 18]. The top three symptoms of the IC/BPS patients were pain/discomfort in two studies [12, 15], frequency and urgency in one study [15], and anxiety/depression in one study [12]. One study [12] showed that IC/BPS patients have worse HRQoL than healthy individuals. However, HRQoL is restored to a level close to normal after surgical treatment. Another study [15] indicated that Caffeine intake and constipation might be related factors affecting the quality of life for patients with IC/BPS. Therefore, urologists should recommend changes in diet and lifestyle to reduce symptoms and improve the patient's quality of life. One more study [16] stated that poor sleep quality and short sleep duration, as well as disorder-specific sleep disturbances, were highly prevalent in women with IC/BPS and are associated with poorer disease-specific and general QOL. One

last study [18] illustrated that sexual function was adversely affected. All sexually active women reported vulvar and vaginal discomfort during sexual intercourse.

After diagnosis, one study [14] revealed that age, insurance type, and improvement in scores on the symptom impact scale predicted improvement in HRQOL and treatment in the multivariable model. In addition, participants reported improvements in global and symptom-specific quality of life measures after diagnosis and treatment for IC/BPS.

To improve the quality of life of IC/BPS patients, four studies [13, 17, 18, and 19] implemented different techniques. One study [18] showed that simple cystectomy in female patients with IC/BPS and low BC improves pain symptoms and quality of life. Another study [17] showed that treatment with Hyaluronic acid (HA) plus chondroitin sulfate (CS) appears to be as effective as Dimethyl sulfoxide (DMSO) with a potentially more favorable safety profile. Both treatments increased health-related quality of life, while HA/CS showed a more acceptable cost-effectiveness profile. One more study [19] observed that Patients with bladder pain syndrome/interstitial cystitis who were resistant to conventional therapy experienced significant and clinically meaningful improvements in their quality of life and bladder discomfort after receiving 100 U of Onabotulinumtoxin A. Additionally, it was well tolerated. One last study [13] proved that pelvic floor muscle training with biofeedback (BFB) improved the quality of life in women with interstitial cystitis as an adjunct therapy to combined oral and intravesical treatment.

DISCUSSION

Interstitial cystitis/bladder pain syndrome (IC/BPS) is characterized by persistent pelvic pain, frequent urination, and urgency without other diagnosed pathologies such as a urinary tract infection or cancer. It is commonly recognized that IC/BPS is linked to decreased mobility, sleep, sexual dysfunction, and work productivity. Quality of life (QoL) continues to be difficult to define, making its evaluation difficult. Most authors will concur that QoL is a qualitative assessment of the subject's overall health state. [20] A comprehensive definition of quality of life (QoL) must consider individual objectives and expectations, the existence of living situations, and one's happiness with those conditions. [9] This systematic review aimed to evaluate the quality of life (QoL) in patients with interstitial cystitis and the strategies used to improve it.

In the current systematic review, Ko et al. (2022), Wang et al. (2021), Troxel et al. (2014), and Zambon et al. (2019) found that IC/BPS has a great influence on the quality of life of patients. The top three symptoms of the IC/BPS patients were pain/discomfort, as reported by Ko et al. (2022), Wang et al. (2021), frequency and urgency, as reported by Wang et al., and anxiety/depression, as reported by Ko et al. Ko et al. showed that IC/BPS patients have worse HRQoL than healthy individuals. However, HRQoL is restored to a level close to normal after surgical treatment. Wang et al. indicated that Caffeine intake and constipation might be related factors affecting the quality of life (QoL) of patients with IC/BPS. Urologists should recommend changes in diet and lifestyle to reduce symptoms and improve the patient's quality of life. Troxel et al. (2014) stated that poor sleep quality and short sleep duration, as well as disorder-specific sleep disturbances, were highly prevalent in women with IC/BPS and are associated with poorer disease-specific and general QOL. Zambon et al. (2019) illustrated that sexual function was adversely affected. All sexually active women reported vulvar and vaginal discomfort during sexual intercourse. Similarly, Nickel et al. (2010) reported that patients reported considerably more problems with sexual and social function than controls, worse physical quality of life, higher sleep disruption, depression, catastrophizing, anxiety, and stress. [21] In addition, Lai et al. (2015) indicated that psychological stress levels were as high in IC/BPS patients. However, No significant relationship was reported between perceived stress levels and urgency or frequency of symptoms. [22] Romão et al. (2009) have demonstrated that compared to healthy controls or even other chronically ill populations, patients with

IC/BPS are more likely to experience depressive symptomatology. Additionally, it is recognized that individuals with IC/BPS and anxiety have a significantly lower quality of life (QoL), particularly in the psychological, social, and environmental domains. [23]

After diagnosis, Volpe et al. (2021) revealed that age, insurance type, and improvement in scores on the symptom impact scale predicted improvement in HRQOL and treatment in the multivariable model. Participants reported improvements in global and symptom-specific quality of life measures after diagnosis and treatment for IC/BPS. To improve the quality of life of IC/BPS patients, Borrego-Jimenez et al. (2021), Cervigni et al. (2017), Zambon et al. (2019), and Pinto et al. (2018) implemented different techniques. Zambon et al. (2019) showed that simple cystectomy in female patients with IC/BPS and low BC improves pain symptoms and quality of life. Cervigni et al. (2017) showed that treatment with Hyaluronic acid (HA) plus chondroitin sulfate (CS) appears to be as effective as Dimethyl sulfoxide (DMSO) with a potentially more favorable safety profile. Both treatments increased health-related quality of life, while HA/CS showed a more acceptable cost-effectiveness profile. Pinto et al. (2018) observed that Patients with bladder pain syndrome/interstitial cystitis who were resistant to conventional therapy experienced significant and clinically meaningful improvements in their quality of life and bladder discomfort after receiving 100 U of Onabotulinumtoxin A. Additionally, it was well tolerated. Borrego-Jimenez et al. (2021) proved that pelvic floor muscle training with biofeedback (BFB) improved the quality of life in women with interstitial cystitis as an adjunct therapy to combined oral and intravesical treatment.

A qualitative increase in QoL is a key component of therapy effectiveness in the IC/BPS population. However, there is limited information on whether this improvement has been observed with most treatment methods. The quality of life (QoL) dimension has improved after therapy in research using the ICSI, SF-36, and King's Health Questionnaire. Still, no particular studies have utilized validated metrics to evaluate QoL precisely. [7] One of the most frequent reasons for cystectomy in patients without cancer who are unresponsive to medical treatment is interstitial cystitis. Seven out of twelve patients reported ideal ICSI ratings of 0 following definitive surgery in one small series assessing QoL after cystectomy. [24] Regarding the enhancement of QoL, hydrodistension has shown incredibly inconsistent findings. [25] Numerous studies have demonstrated that Botox causes a successful improvement in QoL after

retreatment, despite some ongoing disagreement. In addition, a few patients reported lower QoL scores than the baseline values before the original treatment before the re-injection when question 8 of the IPSS score was utilized to address QoL. [26] These studies have been criticized because they suggest that cystoscopy-related hydrodistension improves the quality of life (QoL) more than Botox treatment alone. Numerous studies have demonstrated that dimethyl sulfoxide (DMSO) installations enhance LUTS-related QoL. The typical duration of treatment effects is between 16 and 72 months. [27] Studies on QoL with chondroitin sulphate and hyaluronic acid are scarce. [28,29]

CONCLUSION

The present systematic review concluded that IC/BPS greatly influences patients' quality of life. The top three symptoms of the IC/BPS patients were pain/discomfort, frequency and urgency, and anxiety/depression. Even though IC/BPS patients had worse HRQoL than healthy individuals, their HRQoL was restored to a level close to normal after surgical treatment. Caffeine intake and constipation may be related factors affecting patients' quality of life with IC/BPS. Poor sleep quality, short sleep duration, and disorder-specific sleep disturbances were highly prevalent in women with IC/BPS and are associated with poorer disease-specific and general QOL. Sexual function was also adversely affected.

To improve the quality of life of IC/BPS patients, simple cystectomy in female patients with IC/BPS and low BC was found to improve pain symptoms and quality of life. Treatment with Hyaluronic acid (HA) plus chondroitin sulfate (CS) appeared to be as effective as Dimethyl sulfoxide (DMSO) with a potentially more favorable safety profile. Both treatments increased health-related quality of life, while HA/CS showed a more acceptable cost-effectiveness profile. Patients with bladder pain syndrome/interstitial cystitis who were resistant to conventional therapy experienced significant and clinically significant improvements in their quality of life and bladder discomfort after receiving 100 U of Onabotulinumtoxin A. Additionally, pelvic floor muscle training with biofeedback (BFB) as an adjuvant therapy to combined oral and intravesical medication was found to the quality of life in women with BPS/IC.

REFERENCES

1. Fall M, Baranowski AP, Elneil S et al. EAU guidelines on chronic pelvic pain. Eur. Urol. 2010; 57: 35–48.

2. Nickel JC. Interstitial cystitis- an elusive clinical target? J. Urol. 2003; 170: 816–7.

3. Birder LA. Pathophysiology of interstitial cystitis. International Journal of Urology. 2019 Jun;26:12-5.

4. Hanno PM. Painful bladder syndrome/interstitial cystitis and related disorders. In: Wein AJ, Novick KL, Partin AW, Peters CA (eds). Campbell-Walsh Urology. W.B. Saunders Company, Philadelphia, 2007; 330–70

5. Lugendorf SK, Kreder KH, Rothrock NE, Ratliff TL, Zimmerman B. Stress and symptomatology in patients with interstitial cystitis: a laboratory stress model. J. Urol. 2000; 164: 1265–9.

6. Pierce AN, Christianson JA. Stress and chronic pelvic pain. Prog. Mol. Biol. Transl. Sci. 2015; 131: 509–35.

7. Vasudevan V, Moldwin R. Addressing quality of life in the patient with interstitial cystitis/bladder pain syndrome. Asian journal of urology. 2017 Jan 1;4(1):50-4.

8. Barofsky I. Can quality or quality of life be defined? Qual Life Res. 2012;21:625–631.

9. Felce D, Perry J. Quality of life: Its definition and measurement. Research in developmental disabilities. 1995 Jan 1;16(1):51-74.

10. WHOQOL . World Health Organization; 1997. Measuring quality of life. Programme on mental health: division of mental health and prevention of substance abuse; pp. 1–10.

11. Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gøtzsche PC, Ioannidis JP, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. PLoS medicine. 2009;6(7):e1000100.

12. Ko KJ, Lim J, Yu J, Kang D, Cho J, Lee KS. The impact of Hunner lesion-type interstitial cystitis/bladder pain syndrome on health-related quality of life and the effects of transurethral ablation. Quality of Life Research. 2022 Nov;31(11):3221-8.

13. Borrego-Jimenez PS, Flores-Fraile J, Padilla-Fernández BY, Valverde-Martinez S, Gómez-Prieto A, Márquez-Sánchez MT, Mirón-Canelo JA, Lorenzo-Gómez MF. Improvement in Quality of Life with Pelvic Floor Muscle Training and Biofeedback in Patients with Painful Bladder Syndrome/Interstitial Cystitis. Journal of clinical medicine. 2021 Feb 19;10(4):862.

14. Volpe KA, Mandelbaum R, Rodriguez LV, Özel BZ, Rolston R, Dancz CE. Does Obtaining a Diagnosis of Interstitial Cystitis/Bladder Pain Syndrome Improve Symptoms or Quality of

Life? A Cross-sectional Questionnaire-Based Study. Female Pelvic Medicine & Reconstructive Surgery. 2021 May 1;27(5):328-33.

15. Wang JW, Liu JC, Meng LF, Zhang W, Liu XD, Zhang YG. Quality of life and related factors in patients with interstitial cystitis/bladder pain syndrome. Beijing da xue xue bao. Yi xue ban= Journal of Peking University. Health Sciences. 2021 Aug 1;53(4):653-8.

16. Troxel WM, Booth M, Buysse DJ, Elliott MN, Suskind AM, Clemens JQ, Berry SH. Sleep disturbances and nocturnal symptoms: relationships with quality of life in a population-based sample of women with interstitial cystitis/bladder pain syndrome. Journal of Clinical Sleep Medicine. 2014 Dec 15;10(12):1331-7.

17. Cervigni M, Sommariva M, Tenaglia R, Porru D, Ostardo E, Giammò A, Trevisan S, Frangione V, Ciani O, Tarricone R, Pappagallo GL. A randomized, open-label, multicenter study of the efficacy and safety of intravesical hyaluronic acid and chondroitin sulfate versus dimethyl sulfoxide in women with bladder pain syndrome/interstitial cystitis. Neurourology and Urodynamics. 2017 Apr;36(4):1178-86.

18. Zambon*, J., Hemal, K., Evans, R., Badlani, G., Walker, S., Plair, A., Smith, W., Parker-Autry, C. and Matthews, C., 2019. MP47-18 SIMPLE CYSTECTOMY FOR FEMALE patients with refractory interstitial cystitis/bladder pain syndrome: is there any long-term impact on quality of life, body image, and sexual function?. The Journal of Urology, 201(Supplement 4), pp.e695-e695.

19. Pinto RA, Costa D, Morgado A, Pereira P, Charrua A, Silva J, Cruz F. Intratrigonal onabotulinumtoxinA improves bladder symptoms and quality of life in patients with bladder pain syndrome/interstitial cystitis: a pilot, single center, randomized, double-blind, placebo controlled trial. The Journal of Urology. 2018 Apr;199(4):998-1003.

20. Bo K, Frawley HC, Haylen BT, Abramov Y, Almeida FG, Berghmans B, Bortolini M, Dumoulin C, Gomes M, McClurg D, Meijlink J. An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for the conservative and nonpharmacological management of female pelvic floor dysfunction. International urogynecology journal. 2017 Feb;28(2):191-213.

21. Nickel JC, Tripp DA, Pontari M, et al. Psychosocial phenotyping in women with interstitial cystitis/painful bladder syndrome: a case control study. J Urol. 2010;183:167-172.

22. Lai H, Gardner V, Vetter J, Andriole GL. Correlation between psychological stress levels and the severity of overactive bladder symptoms. BMC urology. 2015 Dec;15(1):1-7.

23. Romão AP, Gorayeb R, Romão GS, Poli-Neto OB, Dos Reis FJ, Rosa-e-Silva JC, Nogueira AA. High levels of anxiety and depression have a negative effect on quality of life of women with chronic pelvic pain. International journal of clinical practice. 2009 May;63(5):707-11.

24. Norus T, Fode M, Nordling J. Ileal conduit without cystectomy may be an appropriate option in the treatment of intractable bladder pain syndrome/interstitial cystitis. Scandinavian journal of urology. 2014 Apr 1;48(2):210-5.

25. McCahy PJ, Styles RA. Prolonged bladder distension: experience in the treatment of detrusor overactivity and interstitial cystitis. European urology. 1995;28:325-7.

26. Ware Jr JE. SF-36 health survey update. Spine. 2000 Dec 15;25(24):3130-9.

27. Rössberger J, Fall M, Peeker R. Critical appraisal of dimethyl sulfoxide treatment for interstitial cystitis discomfort, side-effects and treatment outcome. Scandinavian journal of urology and nephrology. 2005 Feb 1;39(1):73-7.

28. Steinhoff G. The efficacy of chondroitin sulphate in treating interstitial cystitis. European Urology Supplements. 2003 Sep 1;2(4):14-6.

29. Istek A, Gungor Ugurlucan F, Yasa C, Gokyildiz S, Yalcin O. Randomized trial of long-term effects of percutaneous tibial nerve stimulation on chronic pelvic pain. Archives of gynecology and obstetrics. 2014 Aug;290(2):291-8.