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ORIGINAL ARTICLE

Effectiveness of diet, sexual habits and lifestyle modifications on treatment of chronic pelvic pain syndrome

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BACKGROUND: The potential benefits of a therapeutic regimen for chronic pelvic pain syndrome (CPPS) based on the adherence to some specific rules concerning diet, sexual habits and lifestyle have never been investigated.
METHODS: A review of literature was executed to prepare a vademecum of 13 rules relating to diet, sexual habits and lifestyle that patients had to adhere to in order to treat CPPS. Patients affected by CPPS were enrolled and assigned to two equal groups that were both treated with 100 mg of nimesulide for 1 week. Group two patients were instructed to adhere to the vademecum rules, whereas patients in Group one received instructions to make no changes in their lifestyles. The NIH-Chronic Prostatitis Symptom Index was administered at baseline and after 3 months. The main outcome measure was the change in the mean total NIH-Chronic Prostatitis Symptom Index scores between the two groups from baseline to after treatment. Statistical methods for two-group comparisons were used.
RESULTS: Overall,100 patients were recruited. Thirty-nine out of fifty patients (78%) belonging to Group two adhered to the vademecum rules. In Group one, the total NIH-Chronic Prostatitis Symptom Index score was 21.9 at baseline and 17.6 post-treatment, whereas in Group two these scores were 22.1 and 8.1, respectively ($P<0.0001$).
CONCLUSIONS: We detected 13 potentially eliminable risk factors for CPPS on the basis of which we prepared a vademecum of 13 rules to treat this disease that were well tolerated and highly effective in significantly reducing all types of symptoms caused by CPPS.

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INTRODUCTION

Prostatitis is one of the most common urologic pathologies.[1] The most frequent form of prostatitis is chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS), defined as the presence of genitourinary pain in the absence of uropathogenic bacteria detected by standard microbiological methodology. The world-wide accepted National Institutes of Health (NIH) classification defined this form of prostatitis as 'Type III'.[2] Despite of its large diffusion rate, the etiology of CP/CPPS remains poorly understood. Numerous studies on prostatitis have focused on an infectious etiology suggesting that microorganisms may be important causative agents.[3–6] However, only 5–10% of cases are known to have a bacterial etiology and can be classified as Type I or Type II prostatitis.[7–8]

Evidence-based treatment of CPPS has been difficult because of the heterogeneous patient population presenting this syndrome. Patients are usually treated with costly and often unsuccessful antibiotic cycles with their attendant risks and side effects. Even the seemingly proven use of α-blocker therapy has been shown to be ineffective.[9]

The management of CPPS still represents a most challenging problem and is a source of frustration for both patients and urologists. These patients typically consult multiple physicians and often claim psychological problems including sexual dysfunction and impotence.[10]

Several epidemiologic studies published in the official medical literature have focused on the etiology of CPPS and on some risk factors arising from an unhealthy diet or wrong lifestyle activities. Such studies highlighted that these risk factors are largely modifiable, providing new potential targets for treatment and prevention.[11]

To our knowledge, the potential benefits of a therapeutic regimen for CPPS based on the adherence to some specific rules relating to diet, sexual habits and lifestyle have never been investigated.

Objectives of the present study were as follows:

(1) To review the medical literature on risk factors for prostatitis and related conditions associated with an unhealthy lifestyle, sexual behavior and dietary habits that are potentially modifiable;
(2) To prepare a vademecum of rules based on such scientific evidence;
(3) To investigate the prevalence of such risk factors in a survey of patients who presented at our center with a diagnosis of Type III prostatitis
(4) To investigate the effectiveness of and the compliance to this vademecum of rules in the treatment of CPPS in association with a NSAID (nimesulide).

MATERIALS AND METHODS

At the initial phase of this prospective randomized clinical trial we reviewed the English official medical literature since 1990 using the PubMed search engine to look for studies focusing on the affects of alterations in lifestyle, sexual and dietary habits on the etiopathogenesis of CPPS. Furthermore, owing to the strong evidence for a significant correlation and overlap between CPPS and other related conditions, we extended the same research to risk factors responsible for interstitial cystitis/bladder pain syndrome (IC/BPS).[12–18]

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Papers published in peer-reviewed journals were also included in this review. Papers in non-peer-reviewed supplements were excluded. An exhaustive list was obtained through the major databases (e.g. Medline, Embase, Cochrane Library and Science Citation Index). We also reviewed the tables of contents of major urology journals and other relevant journals for the previous 3 months to take into account the possible delay in indexing papers in the databases. We used several search terms such as risk factor, diet, lifestyle, food, beverages and others that were cross-referenced with the terms prostatitis, chronic pelvic pain, interstitial cystitis and bladder pain syndrome.

Using the principles of evidence-based medicine we assigned a level of evidence to every risk factor that was identified.[19]

On the basis of the scientific evidence obtained from such studies, we prepared a vademecum of 13 rules that patients must adhere to relating to diet, sexual habits and lifestyle (Appendix 1). We enrolled all patients who presented at our center with a diagnosis of chronic abacterial form of prostatitis (Category III of NIH). The study population was evaluated at baseline by a detailed history and physical examination, standard microbiologic cultures and microscopic analysis of urine (before and after prostatic massage). At the start of the study, patients refilled the Italian-validated version of the NIH-Chronic Prostatitis Symptom Index (NIH-CPSI) (total score: 0–43) with its subscales (pain domain (0–21), micturition domain (0–10) and quality-of-life domain (0–12)).[20]

Inclusion criteria were: (1) a diagnosis of Category IIIa or IIIb CPPS (with or without the presence of leukocytes); (2) age between 20 and 50 years; (3) a score of >1 in the pain domain of NIH-CPSI; (4) duration of symptoms $\geqslant 3$ months and $\leqslant 12$ months; (5) presence of at least one risk factor in clinical history. Exclusion criteria were: (1) diagnosis of a bacterial form of prostatitis (category I and II of NIH) assessed after lower urinary tract localization studies;[21] (2) a previous urinary tract infection within the last year; (3) consumption of drugs, which could modify lower urinary tract function; (4) severe gastric problems, coagulation problems, renal and/or epatic failure contraindicating the consumption of NSAIDs.

By using a stratified randomization system, recruited patients were assigned into two homogeneous and equal groups according to the baseline value of NIH-CPSI, patients age, duration of symptoms and a number of detected risk factors. Study design is illustrated in Figure 1. Both groups were treated with 100 mg of nimesulide twice daily after a meal for 7 days. Patients belonging to Group one were invited to follow the same diet, sexual behaviors and lifestyle as that of the previous months. On the other hand, we individually discussed with patients belonging to Group two the risk factors detected at their history by the refilled questionnaire given in Appendix 2. We informed Group two patients that such risk factors were potential causes of their disease symptoms and it was strongly recommended to avoid them. Furthermore, we distributed a copy of the above-mentioned vademecum to Group two patients requesting them to strictly follow its rules giving importance to the specific risk factors detected during the examination of their history (Appendix 1). A second visit was scheduled after 3 months during which patients completed the NIH-CPSI again and were asked whether they experienced any adverse effects from the treatment. At second consultation, patients assigned to Group two were asked whether they effectively adhered to the diet, sexual habits and lifestyle modification rules given to them at first visit. An affirmative or negative answer was only admitted for this question. Only patients who correctly followed vademecum rules were considered for outcome measurements, the others were excluded.

A six-point reduction in the total symptom score after treatment was considered a criterion of response to treatment. Patients in Group two who did not adhere to treatment were considered nonresponders.

Main outcome measures

The analysis of the outcomes was focused on the change in the mean total NIH-CPSI scores between the two groups from baseline to after treatment. Secondary analyses included the change in the mean NIH-CPSI subdomains (pain, micturition, quality of life) pre- and post-treatment. The usual statistical methods for two-group comparisons were used: the student *t*-test, the Wilcoxon rank sum test, the x^2 test and analysis of covariance with baseline values as covariates.

RESULTS

Review of current literature about CPPS risk factors and preparation of a vademecum of rules regarding diet, sexual habits and diet modifications

After an extensive and careful review of the literature, we found several risk factors whose role has been documented in the etiopathogenesis of CP/CPPS and its related conditions. We

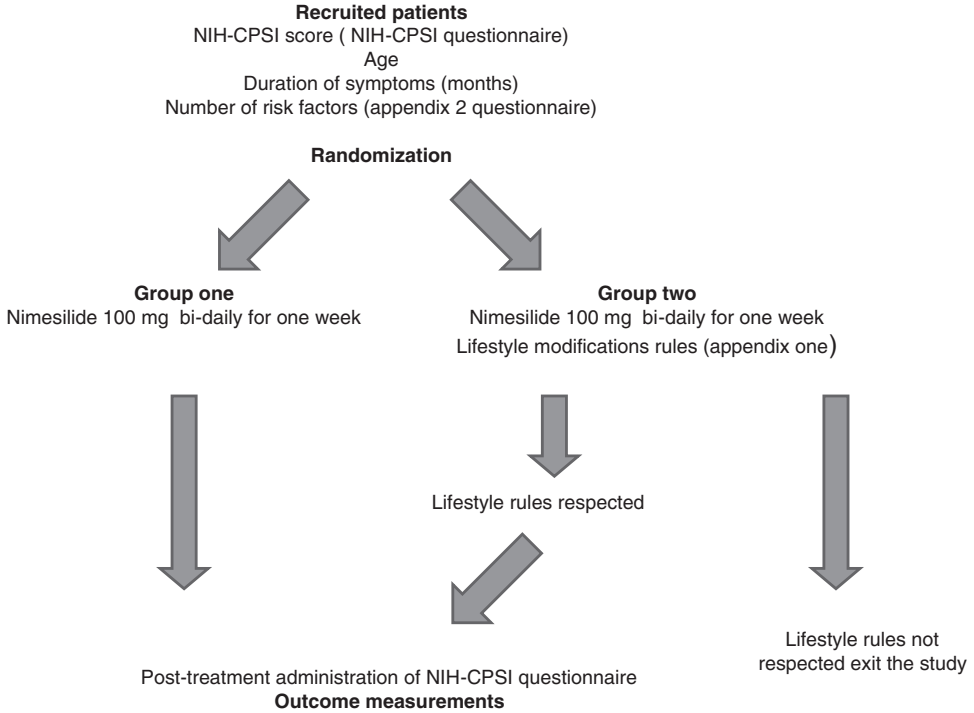

Figure 1. Study design. NIH-CPSI, National Institutes of Health-Chronic Prostatitis Symptom Index.

focused our analysis on 16 articles regarding prostatitis[11;22–36] and on four papers concerning IC/BPS.[37–40] When reviewing such articles, we found a total of 13 potentially eliminable risk factors: five came from diet; four were related to sexual habits; one on lifestyle; and three related to perineal traumatism causing pelvic floor muscle tenderness.

Such risk factors are reported in Table 1 and will be individually discussed in the following text.

Table 1 also reports level of evidence of every risk factor and grade of recommendation of suggested measures according to the principle of evidence-based medicine.[19]

(A) Dietary factors

(1) Alcohol beverages. Three studies focusing on prostatitis and three studies concerning IC/BPS remarked the role of alcohol intake in these conditions.[11,23–24,38–40]

In a Chinese population evaluated by Liang, the incidence of alcohol consumption was 63.4% in prostatitis-like syndrome compared with 54.9% in controls, and in an Italian population studied by Bartoletti *et al* these rates were 63 and 51.3% respectively.[11,23] Both these authors considered alcohol consumption as present or absent. In a study led by the group of Collins evaluating health professionals in the U.S. men who drunk more than two alcohol beverages per night had a major risk of history of prostatitis. Using validated questionnaires, Shorter *et al* [40] investigated the type of foods or beverages that had a negative effect on IC/BPS. Such authors found that red and white wine, beer, champagne and other alcoholic beverages worsened the symptoms of female patients affected by this condition. Similar results were obtained in two other studies focusing on risk factors for IC/BPS, which were conducted by Link and Koziol.[39–40]

(2) Coffee. Coffee intake was found to be a risk factor for IC/BPS syndrome in three studies.[37–38,40]Shorter *et al*.[40] found that coffee and decaffeinated coffee worsened symptoms in 61 and 47% of patients, respectively, affected by IC. Similarly, in the investigation conducted by Koziol, this same rate was more than 50%.[38] Bade *et al* found that IC patients consumed less coffee (caffeine) compared with the general population.[37] Based on these studies, there is evidence supporting the hypothesis that coffee exacerbates irritative voiding symptoms. Daniel Shoskes, one of the major worldwide experts on CP/CPPS, in one of his commentaries on this disease affirms that avoiding caffeine is a simple and effective supportive measure in treatment and prevention of this condition.[34]

(3) Hot pepper and spicy foods. Shorter found that the following comestibles worsened IC/BPS symptoms with these relative incidences: spicy food (66%), chili (52%), hot peppers (39%), Mexican food (47%), Thai food (28%), Indian food (25%), horseradish (32%), burritos (29%).[40] Likely, these substances have a role in exacerbating irritative voiding symptoms because of their direct effect on the urothelial mucosa. On the basis of his wide experience in the management of prostatitis, Shoskes exhorts physicians to suggest avoiding spicy food to their patients.[34]

Based on the above-mentioned evidence, we suggested that our patients avoid consumption of all kinds of alcohol beverages, spicy food, pepper, chilli and coffee (Appendix 1).

(4) Excessive diet. Bartoletti *et al* found that the population of patients affected by prostatitis has a higher intake of carbohydrates, milk, cheese and milk derivates and a lower intake of fruit and vegetables.[23] Even Nickel, another recognized expert on prostatitis, agrees about this point in one of his reviews.[31] On the basis of this evidence we instructed our patients to follow a strict diet assuming 50% carbohydrates, 30% fats and 20% proteins each day (Appendix 1).

(5) Bowel dysfunction. Bartoletti and coauthors found that 50% of patients complained of irregular rectal function, abdominal

Table 1. Risk factors for CPPS identified in medical literature

	Suggested measure	*Author*	*Level of evidence*	*Grade of reccomendation*
Diet				
Alcohol	Avoidance	Bartoletti,[19] Liang,[11] Collins,[23] *Shorter,*[39] *Link,*[38] *Koziol*[37]	1b	A
Coffee	Avoidance	*Shorter*,[39] *Bade*,[36] *Koziol*,[37] Shoskes[33]	1b	A
Hot pepper and spicy foods	Avoidance	*Shorter*,[39] Shoskes[33]	1b	A
Excessive diet	Correct diet (50% carbohydrates, 30% fats, 20% proteins)	Bartoletti,[19] Nickel[30]	1b	B
Bowel dysfunctions	Increasing intake of fruits, vegetables and foods rich in natural fibers	Bartoletti,[19] Nickel[30]	1b	C
Sexual habits				
Delaying ejaculation	Avoidance	Itza[28]	1a	C
Sexual abstinence	Avoid period of sexual abstinence longer than 4 days	Wallner,[35] Yavascaoglu,[24] Drabick[25]	1b	B
Excessive sex	Avoidance of two ejaculations on the same day	Hu,[27] Collins,[23] Itza[28]	1b	B
Coitus interruptus	Avoidance	Bartoletti[19]	1b	B
Lifestyle				
Sedentary life	Walking and practicing relaxing sport activities	Wallner,[35] *Link*,[38] Giubilei,[26] Collins[23]	1b	A
Perineal traumatism				
Pelvic floor muscle tenderness	Hot baths	Andersson,[21] Osborn,[31] Shoskes[34]	1b	C
Sitting position	Avoidance/donut cushion; hot baths	Shoskes[33]	4	C
Traumatic sports for perineum	Avoidance; hot baths	Leibovitch,[29] Nickel,[30] Sacco[32]	1a	A
Constrictive clothing	Avoidance; hot baths	*Koziol*[37]	1b	B

Abbreviation: CPSS, chronic pelvic pain syndrome; IC/BPS, interstitial cystitis/bladder pain syndrome.
In italic are shown articles about IC/BPS.

constipation and/or frequent episodes of diarrhea, abdominal swelling after dinner and slow digestion.[23] Furthermore, chronic constipation is a factor responsible for pelvic muscle spasm, exacerbating the symptoms of CP/CPPS.[29]

On the basis of these articles, we recommended our patients to increase their intake of fruits, vegetables and foods rich in natural fibers (dark bread, vegetables, spinach) (Appendix 1).

(B) Sexual habits

(1) Delaying ejaculation. In order to increase sexual pleasure some men attempt to delay ejaculation by contracting their pubococcygeus muscles or using other techniques such as 'stop and go' and/or 'squeezing penis'. As suggested by Itza and coworkers, these sexual habits can lead to pelvic musculature tenderness and are harmful causes of CPPS.[29]

(2) Sexual abstinence. In the study of Wallner *et al.* conducted on Afro-American men, sexual frequency was associated with decreased odds of prostatitis.[36] Specifically, decreased frequency of sexual activity was associated with increased risk of prostatitis, with only 21.1% of men with prostatitis history reporting sexual activity two or more times a week compared with 43.8% of men with no history of prostatitis. In a Turkish study, it was shown that having regular ejaculations (at least two per week) was associated with relief of symptoms of CPPS.[25] Those results were explained by the fact that frequent ejaculations presumably clear the prostatic gland and seminal vesicles of stored secretions that may promote or maintain the inflammatory cascade. Evaluating the presence of prostatodynia in a sample of soldiers belonging to the United Nations peacekeeping forces in Haiti, Drabick *et al.* found that some patients reported to have CPPS symptoms during prolonged separation from their spouses were cured with resumption of normal intercourse.[26]

(3) Excessive sex. Hu and coworkers studying the association between abuse and symptoms suggestive of CPPS in the Boston area community noted that men who reported having experienced sexual abuse had increased odds of developing symptoms.[28] Previous abuse increased both the pain and urinary scores from the NIH-CPSI. Evaluating a population of health professionals in the United States, Collins *et al* found that having more than seven ejaculations per month was associated with 1.2–1.5-fold increased odds of a history of prostatitis.[24] Moreover, as reported by Itza, an excessive number of ejaculations is a cause of pelvic musculature spasm and tenderness.[29]

(4) Coitus interruptus. In the study by Bartoletti *et al*., the use of coitus interruptus was found to be a risk factor for CP/CPPS.[23] This author hypothesized that this contraceptive method might induce prostatic swelling.

Studies evaluating the etiology of CPPS by an irregular sexual life suggest that both excessive sex and prolonged abstinence are risk factors for this disease. The more likely explanation of this fundamental aspect could be the following: frequent intercourse prevents prostatic congestion and swelling, but, on the other hand, sexual abuse is a source of pelvic muscle spasm and pain responsible for CPPS.

Hence, we recommended our patients to avoid having two ejaculations during the same day and to have periods of sexual abstinence longer than 4 days. Furthermore, we suggest refraining from any attempts to delay ejaculation and from coitus interruptus (Appendix 1).

(C) Lifestyle

(1) Sedentary life. The association between sedentary life, physical activity and CPPS has been remarked in four studies.[24,27,36,39] Giubilei *et al* found that aerobic exercises are beneficial for CP/CPPS patients determining a reduction of NIH-CPSI.[27] On evaluating the prevalence and the risk factors for prostatitis in a population of African-American men, Wallner found that physical activity is associated with decreased odds of prostatitis.[36] Similarly, in a study evaluating the prevalence and psychosocial correlation of symptoms suggestive of IC/BPS in the Boston area community, Link *et al.* found that women with high levels of physical activity were less likely to have symptoms of this disease.[39] Collins and coworkers also found that sedentary life and obesity (body mass index >27) were associated with a history of prostatitis.[24]

On the basis of these articles, we encouraged our patients to walk and to practice relaxing sports activities that do not cause perineal traumatism (swimming, jogging, free exercises) (Appendix 1).

(D) Perineal traumatism causing pelvic floor muscle tenderness

Several groups have suggested that a myofascial pain syndrome with abnormal pelvic muscle spasm is the primary source of the symptoms of CPPS.[22] In patients with a myofascial pain syndrome, palpation of the affected muscles elicits pain, typically the same pain that patients attribute to their prostatitis. Approximately half of the patients with CPPS have areas of tenderness that are elicited during the physical examination compared with only 7% of asymptomatic controls.[35] The etiology of myofascial pain syndrome recognizes different causes such as sexual abuse, delayed ejaculation, coitus interruptus and chronic constipation that were discussed before. Other causes can consist in small repeated traumas such as prolonged sitting position and sports causing acute or chronic perineal traumatism (bicycling, motorcycling, horseback riding.[29] Furthermore, supporting the evidence that perineum muscle spasm is a determining cause of CPPS, Osborn and coworkers reported very good therapeutic results using muscle-relaxant drugs.[32]

(1) Sitting position. Prolonged sitting position is a cause of perineal compression. Daniel Shoskes affirms that suggesting patients to sit on a donut-shaped cushion is a simple and often effective supportive measure for prevention and treatment of prostatitis.[34]

(2) Sports that create chronic pelvic stimulation (cycling, horse riding and others). Some sports that cause perineal compression, such as cycling, can result in or exacerbate CP/CPPS symptoms.[33] Some animal studies have showed that continuous prostatic compression is a potential factor for smooth muscle spasm and chronic inflammation to prostatic parenchyma due to prolonged ischemia.[41–42] Furthermore, pedaling while sitting on a slim hard saddle and being constantly subjected to repetitive impacts generates extreme perineal pressure, which indirectly compresses the pudendal nerves and arteries along their course inside Alcock canal. This mechanism is at the basis of the so-called 'pudendal nerve entrapment syndrome', presenting as genitalia numbness, which is reported in 50–91% of the cyclists, followed by erectile dysfunction reported in 13–24%. This syndrome is even responsible for myofascial pain syndrome, chronic perineal pain, CPPS, priapism, penile thrombosis, infertility, hematuria, torsion of spermatic cord, perineal nodular induration and elevated serum PSA.[30]

(3) Constrictive clothing. This issue is a factor responsible for pelvic and perineal compression. In particular, Koziol *et al.* found that constrictive clothing increased IC pain in $>$ 50% of the patients.[38]

On the basis of these studies, we instructed our patients to: avoid sedentary activities and being in the sitting position for long periods of time and to use a donut-shaped cushion if seated for a long time; avoid sports that can be traumatic for the prostate (bicycling, motorcycling, horse riding and others); avoid wearing tight

underpants or trousers; take frequent hot baths or bidets to relax and release pelvic muscles.

The complete vademecum of rules is given in the Appendix 1.

Prevalence of CPPS risk factors in our survey and effects of a diet, sexual habits and lifestyle modification program

Since January 2012 to March 2013, a total of 100 patients coming to our center who responded to our selection criteria were recruited in the present study. On evaluation of their clinical histories, we found at least one risk factor in every patient (min 1–max 9). The prevalence of every single risk factor in our survey is listed in Figure 2. Features of both groups at baseline are reported in Table 2.

All patients completed treatment with 100 mg of nimesulide taken twice daily with minor or no adverse reactions. Thirty-nine out of fifty patients (78%) belonging to Group two responded at control visit as having adhered to the vademecum rules prescribed to them 3 months previously and were considered for outcome measurements. The remaining 11 patients (22%) who did not adhere to the suggested lifestyle was not considered.

In Group one patients treated with a 7-day course of 100 mg of nimesulide taken twice daily, the total NIH-CPSI score was 21.9 at baseline and 17.6 after treatment. Whereas in Group two patients who received nimesulide in association with strict adherance to the vademecum rules the total NIH-CPSI score changed from 22.1 to 8.1.

We found overall a total of 10 out of 50 responders (20%) in Group one and of 39 out of 50 (78%) in Group two ($P<0.0001$). All patients in Group two who adhered to lifestyle rules responded to the treatment. Changes in the total NIH-CPSI score pre- and post-treatment, its domains and the percentage of responders are reported in Table 3 and Figure 3.

We found a statistically significant reduction of NIH-CPSI total score and of all its three subdomains in Group two pre- and post-treatment ($P<0.0001$).

DISCUSSION

Prostatitis is a very common pathology accounting for 13.5% of all outpatient urologic consultations.[23] Although it has a large diffusion rate, the etiology of this disease remains poorly understood. The only recognized factor remains the infectious etiology representing only 5–10% of all cases of prostatitis.[7–8] As there is a lack of evidence of a proven etiopathogenetic mechanism, even the therapy is problematic and frustrating for both clinicians and patients.[12] Hence, some clinicians expend great efforts in the

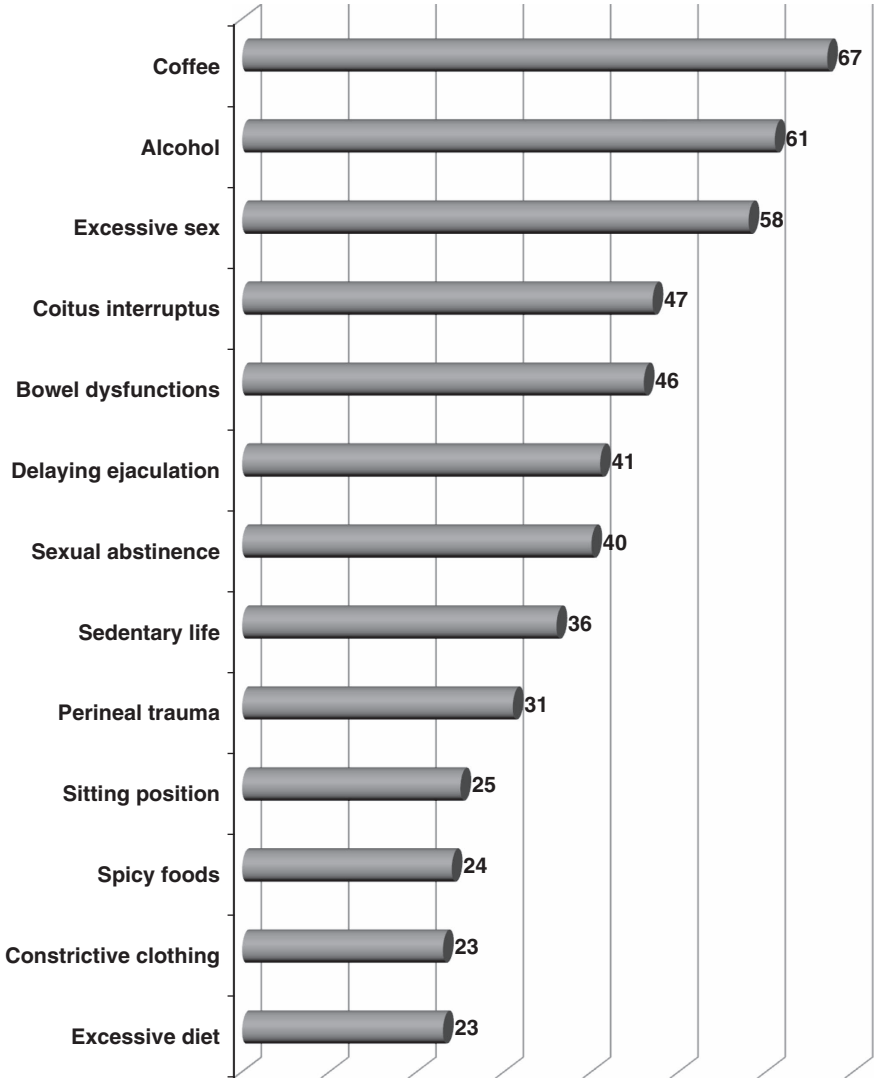

Figure 2. Prevalence of risk factors in our survey (%).

Table 2. Group features at baseline (mean ± s.d.)

	NIH-CPSI total score	*Age*	*Duration of symptoms (months)*	*Number of detected risk factors*
Group one (nimesulide)	21.9 ± 6.9	34.2 ± 8	7.1 ± 3	5.1 ± 1.6
Group two (nimesulide + lifestyle)	22.1 ± 6.4	33.2 ± 7.8	7.4 ± 2.6	5.3 ± 2

Abbreviation: NIH-CPSI, National Institutes of Health-Chronic Prostatitis Symptom Index.

Table 3. Results

	NIH-CPSI score at baseline (mean ± s.d.)	*Age (mean ± s.d.)*	*Duration of symptoms (months) (mean ± s.d.)*	*Number of detected risk factors (mean ± s.d.)*	*Responders (%)*
Group one (nimesulide)	21.9 ± 6.9	34.2 ± 8	7.1 ± 3	5.1 ± 1.6	20
Group two (nimesulide + lifestyle)	22.1 ± 6.4	33.2 ± 7.8	7.4 ± 2.6	5.3 ± 2	78

Abbreviation: NIH-CPSI, National Institutes of Health-Chronic Prostatitis Symptom Index.

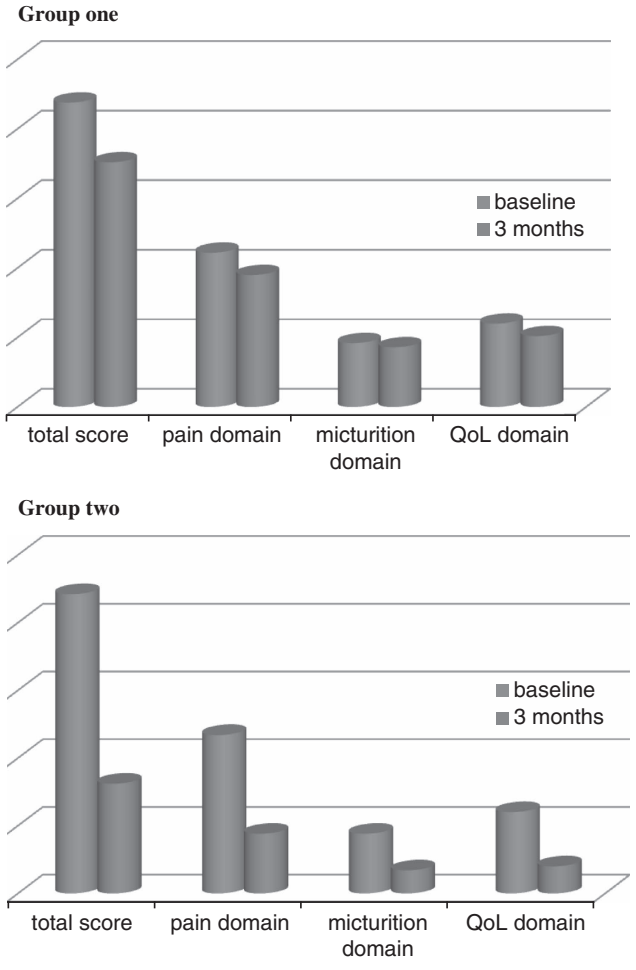

Figure 3. National Institutes of Health-Chronic Prostatitis Symptom Index scores pre- and post-treatment. QoL, Quality of life.

spasmodic research of hidden pathogens responsible for suspected prostatic infections, executing complex laboratory tests in order to prescribe a long course of costly, dangerous and useless antibiotics.[43] Several medications proposed for CP/CPPS showed significant limitations.[12] The common abuse of antibiotics, prescribed even in cases of negative cultures, is not justified, considering that they are no better than a placebo in subjects with long-standing symptoms.[44]

On the basis of the evidence that lifestyle modifications are cornerstones for treatment of important and common pathologies such as diabetes and hypertension, we have showed in this study that this kind of therapeutic approach is highly effective even in the case of CPPS.[45–46] Large epidemiologic studies found that the prevalence of prostatitis presents significant differences between various ethnic groups living in different countries.

Several studies conducted worldwide on samples of populations of various races and geographical origins were published in the official medical literature focusing their attention on research of specific risk factors involved in the etiology of prostatitis and related conditions such as IC/BPS. On reviewing the literature, we found 13 risk factors that were potentially eliminable by a diet and lifestyle modification program. After detecting those risk factors we prepared a vademecum of 13 rules as listed in Appendix 1 that was followed by 78% of patients belonging to Group two. Adherence to these simple and well-tolerated rules combined with the consumption of a safe and inexpensive NSAID, such as nimesulide, was showed in the present study to be very effective in reducing all types of difficult-to-treat pathological symptoms of CPPS. All patients who adhered to lifestyle rules responded to treatment.

Consumption of oral NSAIDs is a common, well-tolerated and inexpensive therapy. As showed by Pontari and Canale *et al.*, based on the principle that CPPS is primarily an inflammatory disease, the use of NSAIDs is the simplest and most rational therapy for CPPS.[47,48] However, to be effective, the use of NSAIDs requires that the noxa patogena responsible for the inflammatory cascade have been previously removed. In this study, the consumption of NSAIDs not associated with a complete abolition of flogistic stimuli arising from an incorrect diet, wrong sexual habits and lifestyle was ineffective in reducing CPPS symptoms.

Overall, in our survey of 100 patients affected by an abacteric form of prostatitis, we found the presence of 522 risk factors with a mean of 5.2 for each patient (min 1–max 9). This datum would suggest that the great majority of CPPS cases is associated with the presence of some risk factors that could have a role in the etiopathogenesis of this very common pathology.

In our study population, the most prevalent risk factors associated with CPPS came from diet and sexual habits. In particular, consumption of coffee and alcohol was found in 67 and 61% of the patients, respectively, whereas excessive sex, coitus

interruptus and delaying ejaculation were detected in 58, 47 and 41% of the patients (Figure 2).

Authors recognize that this paper has the following limitations: some of the risk factors detected, such as consumption of coffee and spicy foods, were not specific for CPPS but came from studies regarding IC/BPS. Furthermore, other risk factors detected, such as, for example, bowel dysfunction, are likely a reflection of common etiology rather than a cause of CPPS.

The authors hope that this paper can be useful to the medical community in order to better understand prostatitis and to ensure an evidence-based form of prevention and treatment of this condition affecting millions of men worldwide.

CONCLUSIONS

On reviewing the medical literature, we detected 13 potentially eliminable risk factors for CPPS. On the basis of those data, we prepared a vademecum of 13 rules to adhere to in order to treat CPPS relating to diet, sexual activity and lifestyle. These rules were well tolerated and highly effective to significantly reduce all types of symptoms caused by CPPS. The majority of risk factors that were found to be associated with CPPS came from an abnormal diet and an irregular sexual life.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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APPENDIX 1

Appendix 1 Diet, sexual habits and lifestyle rules

Diet:

- Avoid consumption of all kinds of alcohol beverages
- Avoid consumption of spicy foods, pepper, chilli and coffee
- Follow a correct diet assuming each day 50% carbohidrates, 30% fats and 20% proteins
- Increase your intake of fruits, vegetables and foods rich of natural fibers (dark bred, vegetables, spinaches)

Sexual activity

- Avoid having two ejaculations during the same day
- Avoid period of sexual abstinence longer than 4 days
- Do not try to delay ejaculation in both intercourse and masturbation
- Do not practice interrupted coitus as contraceptive method (ejaculate outside of partner's vagina)

Lifestyle and perineal traumatism

- Walk and practice relaxing sport activities (swimming, jogging, free exercises).
- Avoid sedentary activities and sitting position for long time. Use a donut-shaped cushion if seated for longtime
- Avoid sports that can be traumatic for your prostate (bicycling, motorcycling, horse riding etc.)
- Avoid to wear tight underpants or trousers
- Take frequent hot baths or bidets during which relax and release pelvic muscles

APPENDIX 2

Appendix 2 Questionnaire to detect risk factors

Dear patient, in order to investigate the potential causes of your problem is very important that you refill this questionnaire in the most sincere and honest way:

Diet

During the previous three months:

Did you drink alcohol beverages (wine, beer, spirits)?
YES ☐ NO ☐

Did you drink more than one cup of coffee each day?
YES ☐ NO ☐

Did you consume pepper, hot chilli and/or spicy foods?
YES ☐ NO ☐

Did you have an excessive diet: high intake of carbohydrates (bread, pizza, rice and pasta) and/or high intake of fats (fried food, cakes, cured meats, cheese, milk) YES ☐ NO ☐

Did you have symptoms of bowel dysfunction (meteorism, irregular rectal function, abdominal constipation and/or frequent episodes of diarrhea, abdominal swelling after dinner, slow digestion)? YES ☐ NO ☐

Sexual habits

During the previous three months:

Did you try to delay ejaculation during intercourse and/or at masturbation? YES ☐ NO ☐

Did you have periods of sexual abstinence (absence of ejaculations) longer than four days? YES ☐ NO ☐

Did you have two ejaculations on the same day? YES ☐ NO ☐

Did you use coitus interruptus as anticoncepcional method (coming out of your partner's vagina)? YES ☐ NO ☐

Lifestyle

During the previous three months:

Did you have a sedentary life? YES ☐ NO ☐

Perineal traumatism

During the previous three months:

Did you have frequently a sitting position (for example driving car or sitting in front of a computer for long time)? YES ☐ NO ☐

Did you practice sports or activities that created pelvic traumatic stimulations (bycycling, motorcycling, horse-riding)? YES ☐ NO ☐

Did you wear constrictive clothing (underpants, trousers etc)? YES ☐ NO ☐