

CHAPTER 9

IS THERE A RATIONALE FOR DIETARY GUIDELINES IN INTERSTITIAL CYSTITIS?

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Submitted

Abstract:

Objective: To evaluate the consumption of foods and fluids from interstitial cystitis (IC) patients compared to the averages of the general population, and to investigate any spontaneous preference or avoidance of specific foods and liquids among interstitial cystitis patients.

Patients and Methods A descriptive study. A verbal interview of 16 IC patients provided information on consumption of foods and fluids as well as dietary habits. The results were compared with averages of the general population. The one-sample Student t-test and the Chi-square test were used to detect statistically significance.

Results IC patients consumed statistically significant less energy, fat and coffee, and statistically significant more fibres and tea than the general population. The intake of other acid-producing- foods did not differ from the general population. All the IC patients, prior to the dietary interview, were unaware of any possible dietary measures in relation to their IC symptoms.

Conclusion According to general standards the 16 IC patients had a more healthy daily diet compared to the general population. The IC patients consumed statistical significant less coffee (caffeine) compared to the general population. This confirms previous reports on studies demonstrating an exacerbation of irritative IC symptoms following caffeine provocation. A caffeine-restricted diet for symptomatic IC patients is the single dietary advise supported by the data of this study.

INTRODUCTION

Interstitial Cystitis (IC), as part of the painful bladder disease complex, includes a large group of patients with bladder pain, irritative voiding symptoms (frequency, urgency, nocturia and dysuria) and sterile urine. Interstitial cystitis remains essentially a diagnosis of exclusion, with little certain about its etiology and little distinctive about its pathology^{1,2}. A committee convened by the National Institutes of Health (U.S.A.) has arbitrarily proposed a set of characteristics to define the disease³. A large number of treatment modalities are currently being employed⁴. Often, dietary advice forms part of the therapeutic approach to IC patients, with the aim of influencing the irritative symptomatic expression of the disease. Besides the wide variety of dietary advice from concerned neighbours and relatives, more uniform and specific dietary guidelines are given by doctors and information bulletins from the ICA (Interstitial Cystitis Association, a non-profit health organisation that provides support for IC patients in the United States). Food products considered to exacerbate irritative symptoms include caffeine, citrus fruits, wine and other alcoholic drinks, chocolate, yogurt, sour cream and bananas^{5,6}. The rationale of such dietary advice is largely anecdotal in nature and although some patients may benefit, others may experience it as restricting their quality of life. In the Netherlands, a supportive IC patient association and structural (dietary) information on interstitial cystitis are absent.

In a prospective study, we evaluated the dietary habits of interstitial cystitis patients and compared them to the average diet of the general population. We also investigated whether there was any spontaneous preference or avoidance of specific foodstuffs and fluids by IC patients.

PATIENTS AND METHODS

Symptomatic interstitial cystitis patients were selected for dietary evaluation. All patients were admitted for diagnostic evaluation including routine laboratory examinations, urine culture, urine cytology, a cystometrogram awake (20 cc fill rate per minute) and cystoscopy under anaesthesia with coldcup biopsies and capacity measurement (1 minute at 80 cm H₂O pressure). In addition, the weight of each patient was recorded and their renal function and 24-hour urine pH were measured. During admission all patients were verbally and in written interviewed by one dietician. The study had three parts. In the *first part*, the dietary daily intake was quantified for each patient, including energy, foodconstituents, fluids and specific foods. The results were compared to the average intake of the general population, corrected for age and gender⁷. A map with figures of cups, glasses and meals (plates) was used as reference to quantify the intake of food and liquids⁸. In the *second part* acid-urine-producing and symptom-provoking foods (based on the publications of the interstitial cystitis association in the United States) were listed. Consumption of each

specific food was scored with yes or no. The list included coca-cola, carbonated soft drinks, sour milk products, grapes, grape juice, coffee, tea, citrus fruits, tomatoes, vinegar, spicy foods, alcoholic beverages, chocolate and artificial sweeteners. The *third part* contained open questions about the tolerance of specific foods, fluids and food supplements, and whether the patients had received any previous dietary information or instructions.

Data analysis. To determine the statistical significance of any differences in consumption between the interstitial cystitis patients and the general population we used the two sided Student t-test. The Chi-square test was applied to the differences in actual consumer numbers between the two groups with regard to specific foods. A value of $p < 0.05$ was considered to be statistically significant.

RESULTS

A total of 16 consecutively diagnosed interstitial cystitis patients were interviewed in the period May '94 to October '94. All the patients were female, the mean age was 51.5 years (range 24 - 80 years), the mean disease history was 4.6 years (range 1.5 to 18 years) and the average weight was 71.1 kg (range 52 - 90 kg). According to the weight-height curves for female adults, the weight of one patient was above the 90 percentile line, while the others were between the 10th and 90th percentiles. The pH was measured in 24-hour urine. Two urine samples had a pH of 5.0, three a pH of 6.0 and 14 a pH of 7.0. The renal function, expressed as creatinine clearance (ml per min) of all the patients was normal.

Part 1. The daily food intake of the interstitial cystitis patients compared to the general population is shown in *Table 1*. The mean daily energy intake in the IC group was significantly less ($p < 0.05$) than in the general population. In addition, a significantly reduced intake of fat ($p < 0.01$) and an increased intake of fibres ($p < 0.01$) was recorded. *Table 2* shows the daily intake of specific fluids. The majority of IC patients did not consume coca cola, grapefruit or orange juice. Only the mean daily tea consumption of the IC patients was significantly higher ($p < 0.01$). *Table 3* compares the average daily consumption of specific food products. Consumption of staple foods did not differ significantly, except for meat and meat products ($p < 0.05$). The IC patients consumed significantly less cake and biscuits ($p < 0.01$), and less nuts ($p < 0.01$) than the general population.

Table 1

Average daily intake of energy (Kj and kcal), food constituents (g) and water (ml). Interstitial cystitis patients were compared to the general population, corrected for age and gender.

	IC Patients	SD	General Pop.	Difference
Energy:				
Kj/day	7,046	(1,604)	8,078	-1,032 S
Kcal/day	1,677	(301)	1,930	-253 S
Water (ml/day)	2,639	(810)	2,267	+372
Protein (g/day)	66	(19)	76	-10
Fat (g/day)	65	(17)	82	-17 S*
Carbohydrates (g/day)	207	(48)	209	-2
Fibres (g/day)	22	(8)	15	+7 S*
Vitamin C (mg/day)*	108	(55)	80	+28

* = tablets were not included

S = Significant, $p < 0.05$

S*= Significant, $p < 0.01$

SD = Standard Deviation

Table 2

Average daily intake of specific fluids (ml) by interstitial cystitis patients compared to the general population, corrected for age and gender.

	IC Patients	SD	General Pop.	Difference
Tea (n=16)	717	(422)	380	+337 S*
Coffee (n=11)	379	(390)	540	-161
Sour dairy prod.(n=13)	192	(282)	116	+76
Carbonated soft drinks (n=8)	135	(173)	64	+71
Coca cola (n=4)	71	(151)	20	+51
Orange juice (n=5)	16	(315)	36	-20
Grapefruit juice (n=3)	3		2	+1

S* = Significant, $p < 0.01$

(n)= Between brackets the actual number of consumers among the IC patients

SD = Standard Deviation

Part 2. The number (percentages) of IC patients who consumed acid-urine-producing or symptom-provoking foods are shown in *table 4*. There were significantly fewer coffee consumers ($p < 0.01$) and significantly more tea consumers ($p < 0.05$). The difference in orange juice consumers was not significant.

Table 3

Average intake of specific foodstuffs (g) per day by interstitial cystitis patients compared to the general population, corrected for age and gender.

	IC Pa- tients	General Pop.	Difference
Potatoes	87	107	-20
Bread	130	117	-13
Vegetables	162	144	+17
Meat and meat products	86	105	-18 S
Cereals	32	36	-4
Cake and biscuits	26	48	-22 S*
Sugar and sweets	48	30	+18
Nuts	9	20	-11 S*
Soup	53	73	-20
Fat and sauces	36	41	-5
Cheese	34	29	+5
Eggs	8	14	-6
Fish	7	10	-3
Beans	8	6	+2
Fruits	174	138	+36

S = Significant, $p < 0.05$

S* = Significant, $p < 0.01$

Table 4

The actual number of interstitial cystitis patients who consumed acid-urine-producing foods.

	I.C. patients	General population
Coca-cola	n=4 (25%)	7.5%
Carbonated soft drinks	n=8 (50%)	*
Sour milk products	n=13 (81%)	*
Grapes	n=4 (25%)	6.6%
Grape juice	n=3 (19%)	1.3%
Coffee	n=11 (68%)	92.3% S*
Tea	n=16 (100%)	79.2% S
Oranges juice	n=5 (31%)	26.6%
Citrus fruit	n=9 (56%)	*
Tomatoes	n=10 (63%)	*
Vinegar	n=9 (56%)	*
Spicy foods	n=6 (38%)	*
Alcohol liquids	n=6 (38%)	*
Chocolate	n=3 (19%)	*
Artificial sweeteners	n=3 (19%)	*

S = Significant, $p < 0.05$

S* = Significant, $p < 0.01$

* = No data available of this subgroup for the general population.

Part 3. None of the IC patients had ever received information or instructions about dietary management of their IC symptoms. Only two interstitial cystitis patients experienced an exacerbation of symptoms in relation to consuming specific foods or fluids. One patient reported a coincidence of symptom relapse and a high intake of orange and lemon juice (2.5 l/day) and another patient reported a similar coincidence after drinking coffee. In a period of excessive symptoms six patients deliberately increased their fluid intake, five lowered it and five did not change it.

DISCUSSION

In this study IC patients consumed statistically significantly less calories and fat ($p < 0.05$), and statistically significantly more fibres ($p < 0.05$) than the general population. In addition, a statistically significantly lower consumption of cake - biscuits ($p < 0.01$) and nuts ($p < 0.01$) was demonstrated. Furthermore, among IC patients were significantly fewer coffee consumers ($p < 0.01$) and significantly more tea consumers ($p < 0.05$). The difference in orange juice consumers was not significant.

A causative relation between diet and disease is well-recognised for a number of foodsubstances and organs, e.g. cholesterol and heart failure and suggested for others. The significant differences in the incidence of prostate cancer between the "Far East" and "Western countries" have been related to different diets and a 'causative' or 'protective' influence of fatty or fibre food constituents was suggested, although the explanatory theories are largely hypothetical⁹. In a, questionnaire-based, dietary study Bitterman et al found a correlation between the quantity of fluid intake and the prevalence of urologic cancers¹⁰. It is not yet clear whether there is a relation between diet and interstitial cystitis. In the United States almost all IC patients are given advice about dietary measures to influence their interstitial cystitis symptoms, whereas in the Netherlands, no structural information is available for IC patients. A urologist-based questionnaire, conducted in 1994, revealed that 66% of Dutch urologists never and 34% occasionally use dietary advice in the treatment of interstitial cystitis¹¹.

None of the participants in our study had received any specific information or instructions regarding their diet in relation to their symptoms prior to the study. The general population statistics were corrected for weight and height, age and gender to make them compatible with IC patients. Except for their interstitial cystitis syndrome our patients were healthy with normal renal function and urine pH. The consumption of significantly less energy, fat, cakes & biscuits and nuts, and more fibres is generally considered to be healthy. The interpretation of this finding is rather speculative. Three explanations are possible: firstly, the 'healthier' diet of IC patients reflects mechanisms secondary to the chronic disease, i.e. the intention to follow the most healthy life-style possible in order to reduce the severity of the symptoms, secondly, it might result from the loss of appetite due to debilitating symptoms and thirdly, it reflects cautious compliance with the advice of non-medical acquaintances who often advise extra fruit, vegetables or specific herbal teas. Which theory is applicable remains unclear, but the interstitial cystitis syndrome was the only difference in condition compared to the healthy individuals of the 'general population' and therefore, most probably responsible for the statistically significant differences in diet.

Whitmore et al combined 3-day food and voiding diaries with a quality-of-life questionnaire and demonstrated that the ingestion of acid-urine-producing foods or fluids was associated with an increase in

painful bladder symptoms, while the elimination of acid-urine-producing foods and fluids resulted in the diminution of symptoms⁶. Koziol et al reported that 50% of interstitial cystitis patients identified acid-urine-producing foods or fluids as being the cause for a flare in pain¹². Gillespie reported a marked reduction in pain and frequency in 10 interstitial cystitis patients after dietary restriction of acid-urine-producing foods and foods high in tyrosine, tyramine, aspartate and phenylalanine. Re-challenge with these foodstuffs triggered the onset of symptoms¹³. Presumably, if a specific food or fluid has a clear irritative or protective effect on the intensity of the symptoms, a spontaneous deliberate preference or avoidance of these foodstuffs might follow. In our study, with severe symptomatic IC patients, we observed significantly more tea consumers and fewer coffee consumers. However, the difference in the average intake of coffee was not statistically significant ($p=0.065$) due to the wide variation (Tables 2 and 4). This finding, more tea and less coffee consumption, seems to be contradictory because both fluids contain caffeine, but tea contains far less (40 mg per 150 ml) than coffee (115 mg per 150 ml). Furthermore, although it was not included as a specific question, most of the patients reported a preference for herbal teas, most of which are caffeine-free. Also coca cola (20 mg caffeine per 150 ml) and chocolate (100 mg per 150 ml) consumption were low (Table 4). Thus, our observation of a spontaneous reduction in caffeine intake by non-informed IC patients suggests a relation between IC symptoms and caffeine. This confirms the results of the aforementioned studies. The exact metabolic connection between caffeine and painful bladder symptoms is not known. In general, caffeine is known to have a stimulative effect on the central nervous system due to competitive antagonism with adenosin receptors. Increased diuresis is one of the effects. The increased speed of bladder filling may exacerbate the symptoms. In contrast, six patients deliberately increased their fluid intake during the exacerbation of symptoms in order to obtain more relief from micturation or to benefit from less concentrated urine. With regard to other acid-urine-producing foods, no decrease was observed but a slight increase was noted.

CONCLUSIONS

Although dietary management seems to offer a cost-effective approach to IC patients and to stimulate the "self-help" regimes for IC patients, it might also restrict their quality of life. Until controlled, single-blind, restriction-provocation studies on the effect of different foodstuffs have been performed, strict dietary manipulation is not justified in IC patients at present. The data of this study support the notion that a caffeine-restrictive diet might reduce irritative interstitial cystitis symptoms. No rationale for other dietary manipulation was found.

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