

Diet of patients after pouch surgery may affect pouch inflammation

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Author contributions: Ianco O significantly contributed to data acquisition and drafting the manuscript; Lusthaus M contributed to data acquisition; Ofer A contributed to the study design; Vaisman N contributed to the study design and the interpretation of the results; Santo E contributed to data analysis and manuscript revision; Tulchinsky H and Dotan I planned and designed the study, recruited patients, assessed their clinical status, and contributed to data analysis and the writing of the manuscript.

Supported by A generous grant from the Leona M and Harry B Helmsley Charitable Trust (Partially)

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Received: June 12, 2013 Revised: August 6, 2013

Accepted: August 20, 2013

Published online: October 14, 2013

Abstract

AIM: To investigate the diet of pouch patients compared to healthy controls, and to correlate pouch patients' diet with disease behavior.

METHODS: Pouch patients were recruited and prospectively followed-up at the Comprehensive Pouch Clinic at the Tel Aviv Sourasky Medical Center. Pouch behavior was determined based on clinical, endoscopic and histological criteria. Healthy age- and sex-matched volunteers were selected from the "MABAT" Israeli

Nutrition and Public Health Governmental Study and served as the control group. All the participants completed a 106-item food frequency questionnaire categorized into food groups and nutritional values based on those used in the United States Department of Agriculture food pyramid and the Israeli food pyramid. Data on Dietary behavior, food avoidance, the use of nutritional supplements, physical activity, smoking habits, and body-mass index (BMI) were also obtained. Pouch patients who had familial adenomatous polyposis ($n = 3$), irritable pouch syndrome ($n = 4$), or patients whose pouch surgery took place less than one year previously ($n = 5$) were excluded from analysis.

RESULTS: The pouch patients ($n = 80$) consumed significantly more from the bakery products food group (1.2 ± 1.4 servings/d vs 0.6 ± 1.1 servings/d, $P < 0.05$) and as twice as many servings from the oils and fats (4.8 ± 3.4 servings/d vs 2.4 ± 2 servings/d, $P < 0.05$), and the nuts and seeds food group (0.3 ± 0.6 servings/d vs 0.1 ± 0.4 servings/d, $P < 0.05$) compared to the controls ($n = 80$). The pouch patients consumed significantly more total fat (97.6 ± 40.5 g/d vs 84.4 ± 39 g/d, $P < 0.05$) and fat components [monounsaturated fatty acids (38.4 ± 16.4 g/d vs 30 ± 14 g/d, $P < 0.001$), and saturated fatty acids (30 ± 15.5 g/d vs 28 ± 14.1 g/d, $P < 0.00$)] than the controls. In contrast, the pouch patients consumed significantly fewer carbohydrates (305.5 ± 141.4 g/d vs 369 ± 215.2 g/d, $P = 0.03$), sugars (124 ± 76.2 g/d vs 157.5 ± 90.4 g/d, $P = 0.01$), theobromine (77.8 ± 100 mg/d vs 236.6 ± 244.5 mg/d, $P < 0.00$), retinol (474.4 ± 337.1 μ g/d vs 832.4 ± 609.6 μ g/d, $P < 0.001$) and dietary fibers (26.2 ± 15.4 g/d vs 30.7 ± 14 g/d, $P = 0.05$) than the controls. Comparisons of the food consumption of the patients without ($n = 23$) and with pouchitis ($n = 45$) showed that the former consumed twice as many fruit servings as the latter (3.6 ± 4.1 servings/d vs 1.8 ± 1.7 servings/d, respectively, $P < 0.05$). In addition, the pouchitis patients consumed significantly fewer liposoluble antioxidants, such as cryptoxanthin (399 ± 485

$\mu\text{g/d}$ vs $890.1 \pm 1296.8 \mu\text{g/d}$, $P < 0.05$) and lycopene ($6533.1 \pm 6065.7 \mu\text{g/d}$ vs $10725.7 \pm 10065.9 \mu\text{g/d}$, $P < 0.05$), and less vitamin A ($893.3 \pm 516 \mu\text{g/d}$ vs $1237.5 \pm 728 \mu\text{g/d}$, $P < 0.05$) and vitamin C ($153.3 \pm 130 \text{ mg/d}$ vs $285.3 \pm 326.3 \text{ mg/d}$, $P < 0.05$) than the patients without pouchitis. The mean BMI of the pouchitis patients was significantly lower than the BMI of the patients with a normal pouch: 22.6 ± 3.2 vs 27 ± 4.9 ($P < 0.001$).

CONCLUSION: Decreased consumption of antioxidants by patients with pouchitis may expose them to the effects of inflammatory and oxidative stress and contribute to the development of pouchitis.

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Key words: Ulcerative colitis; Dietary reference intake; Body mass index; Ileal-pouch anal anastomosis; Pouch surgery; Food frequency questionnaire

Core tip: The diet of patients who had pouch surgery differed significantly from that of healthy individuals. Patients with pouchitis consumed significantly fewer fruit servings and antioxidants than patients with normal pouches, thus possibly exposing the former to inflammatory and oxidative stress. The body mass index of patients with pouchitis was significantly lower than patients with normal pouches, probably as a result of the continuous inflammatory burden.

Ianco O, Tulchinsky H, Lusthaus M, Ofer A, Santo E, Vaisman N, Dotan I. Diet of patients after pouch surgery may affect pouch inflammation. *World J Gastroenterol* 2013; 19(38): 6458-6464 Available from: URL: <http://www.wjgnet.com/1007-9327/full/v19/i38/6458.htm> DOI: <http://dx.doi.org/10.3748/wjg.v19.i38.6458>

INTRODUCTION

Total proctocolectomy and the formation of a small bowel reservoir-ileal pouch anal anastomosis (IPAA, "pouch surgery") is the surgery of choice for the treatment of severe, refractory or complicated ulcerative colitis (UC)^[1,2]. Pouch surgery has good short- and long-term outcomes and is associated with improved quality of life^[2]. Inflammation of the pouch ("pouchitis") is the most common long-term complication, with a reported incidence of up to 60%^[3]. Nutrition is increasingly incorporated into the management of inflammatory bowel disease (IBD)^[4]. However, few studies have assessed the influence of nutrition on the health status of pouch patients. Rather most have focused on patients' subjective feelings after consuming specific food products^[5]. Nevertheless, the potential contribution of nutrition to the development of inflammation in the pouch, as well as to IBD in general, remains unclear. Studies have shown that probiotic supplements, such as various strains of lactobacilli 3

(VSL#3), may prevent pouchitis after closure of the ileostomy, shorten the duration of the inflammation, and maintain remission^[6,7]. Several nutritional imbalances may also result from pouch surgery itself, including vitamin B12 and iron deficiency, fat malabsorption and electrolyte and trace element deficiencies^[8-11]. Such deficiencies may, in turn, cause or increase inflammation by mechanisms such as increased tissue oxidative stress^[10].

We hypothesized that diet modification and nutritional imbalance may occur after pouch surgery and that these could be associated with and predispose pouch patients to the development of pouchitis. We further assumed that such major changes might be related to the consumption of essential vitamins, minerals, antioxidants or fibers, which could thus potentially contribute to pouch inflammation^[11-15]. The purpose of the current investigation was thus to gather and analyze the detailed intake of food groups and nutrients as well as examine the nutritional and lifestyle habits of pouch patients, and test for correlations between these parameters and the occurrence of pouchitis.

MATERIALS AND METHODS

Study population

Pouch patients were recruited from the Comprehensive Pouch Clinic at the Tel Aviv Sourasky Medical Center (Tel Aviv, Israel), a tertiary referral center for IBD and the national referral center for pouch patients. Both an IBD-oriented gastroenterologist (Dotan I) and a colorectal surgeon (Tulchinsky H) examined all pouch patients. Healthy age- and sex-matched volunteers were selected from the "MABAT" Israeli Nutrition and Public Health Governmental Study cohort^[16]. Pouchitis was diagnosed by accepted clinical, endoscopic and histological criteria (the pouchitis disease activity index, PDAI^[17]). Pouch status was further defined as normal or pouchitis (recurrent acute pouchitis and chronic pouchitis) as previously described^[2]. Briefly, normal pouch status was defined as no clinical, endoscopic or histological criteria for pouchitis during the previous 2 years and no antibiotic or anti-inflammatory therapy of any type. Chronic pouchitis was defined by clinical, endoscopic and histological criteria that called for chronic administration of antibiotics or anti-inflammatory therapies for more than one month or when there were more than 5 flares of pouchitis within a year^[2,18,19]. Recurrent acute pouchitis was defined as ≤ 5 flares of pouchitis responding to a 2-wk course of antibiotics/year. The data on pouch patients who had familial adenomatous polyposis ($n = 3$), irritable pouch syndrome ($n = 4$), or patients who had had their pouch for less than one year ($n = 5$) were excluded.

Since there was no significant difference in the food and nutrient consumption between the patients with chronic pouchitis and those with recurrent acute pouchitis, they were combined into a single "pouchitis" group. The data for all of the enrolled pouch patients were compared to those of the healthy controls. Patients with a normal pouch status ($n = 23$) were further compared to

Table 1 Food group consumption in pouch patients and healthy controls (mean \pm SD)

Food group	Consumption healthy controls (<i>n</i> = 80, servings/d)	Consumption pouch patients (<i>n</i> = 80, servings/d)	Recommendation ¹	<i>P</i> value
Grains	6.1 \pm 4.0	6.9 \pm 4.01	6-11 ²	0.213
Bakery	0.6 \pm 1.1	1.2 \pm 1.4	6-11 ²	0.030
Potatoes	0.5 \pm 0.5	0.7 \pm 0.6	6-11 ²	0.063
Vegetables	3.9 \pm 2.7	3.6 \pm 2.7	3-5	0.49
Fruits	2.2 \pm 2.1	2.5 \pm 2.8	2-4	0.47
Dairy	3.7 \pm 2.6	4 \pm 3.3	2-3	0.52
Meat, fish and poultry	2.4 \pm 2.2	2.3 \pm 1.6	2-3 ³	0.945
Eggs	0.4 \pm 0.5	0.5 \pm 0.4	2-3 ³	0.206
Legumes	0.4 \pm 0.6	0.3 \pm 0.5	2-3 ³	0.094
Oils and fats	2.4 \pm 2.0	4.8 \pm 3.4	Limited	0.000
Nuts and seeds	0.1 \pm 0.4	0.3 \pm 0.6	Limited	0.012
Snacks and soft drinks	4.5 \pm 3.0	5.0 \pm 4.5	Limited	0.353
Water	6.0 \pm 3.9	6.0 \pm 3.5	-	0.913

¹Serving recommendations according to food pyramid (*n* = 20); ²6-11 servings are recommended for the grains, baked goods or potato categories; ³2-3 servings are recommended for the meat, fish and poultry, eggs, and legume categories.

patients with pouchitis (*n* = 45). All participants gave their informed consent. The study complied with the Helsinki Declaration and the ethical guidelines of our institution.

Questionnaires

All participants were prospectively interviewed using a food frequency questionnaire (FFQ). The 106 items on the FFQ were categorized into food groups according to those defined in the United States Department of Agriculture (USDA) food pyramid^[20] and the Israeli food pyramid^[21]. The questionnaire also included sub-food groups defined in the "MABAT" Israeli Nutrition and Public Health Governmental Study^[16]. The nutritional values of the food items were taken from the USDA FNDD, version 4.1^[22]. The nutritional values of several specific Israeli food items that do not appear in the USDA FNDD database were taken from the Israeli Ministry of Health food consumption and nutrients "TZAMERET" database, version 2^[23]. Pouch patients were also asked about their dietary behavior, food avoidance, and the use of nutritional supplements, as well as physical activity, smoking habits, and body-mass index (BMI). Assessment of the questionnaires was based on the recommended range of values established by the USDA FNDD^[22] and Israeli Health Ministry "TZAMERET"^[23] databases. The nutrient consumption of all participants was compared to the upper limits for daily nutrient recommendations for healthy males and females between the ages of 31-50 years as indicated in the USDA Dietary Reference Intake (DRI) 2010^[24].

Statistical analysis

Statistical analyses were conducted using SPSS software version 19.0 (SPSS Inc. Headquarters, S Wacker Drive, Chicago, IL, United States). A *P* value of < 0.05 was considered significant. Data are presented as mean \pm SD for continuous variables, and frequencies and percentages for categorical variables. Independent *t*-tests were used to compare pouch patients *vs* healthy controls for

food group and nutrient consumption. Fisher's exact test and independent *t*-tests were used to compare normal pouch patients to recurrent acute and chronic pouchitis patients for the categorical and continuous variables, respectively.

RESULTS

Diets of pouch patients vs controls

Eighty adult pouch patients were recruited and compared to 80 healthy adult volunteers. Subjects from both groups were matched for sex and age. Differences in their nutritional intake were first examined by comparing their consumption of servings of the main food groups. The major food groups were divided into subgroups based on the "MABAT" study distribution^[16]. The pouch patients consumed significantly more bakery, oils and fats, and nuts and seeds compared to the controls (Table 1). The consumption of other food groups was comparable. The total nutrient content of foods^[25] consumed by the patients and the control groups is shown in Table 2. The pouch patients' increased consumption of fat servings included significantly more total fat and fat components; *i.e.*, mono-unsaturated fatty acids and saturated fatty acids, than the controls. The pouch patients also consumed significantly higher amounts of several nutrients than the controls, *e.g.*, niacin, zinc, and vitamins C and D (Table 2). These higher levels were usually attributed to external supplements rather than to the diet itself. In contrast, the pouch patients consumed significantly fewer carbohydrates, sugars, theobromine, retinol and dietary fibers compared to the controls. Interestingly, neither the controls nor the pouch patients met DRI recommendations for dietary fiber intake (38 g/d^[24]).

Normal pouch vs pouchitis patients' diets

The pouch patients were divided into a normal pouch group (*n* = 23) and a pouchitis group (*n* = 45) (both recurrent acute and chronic). The demographic parameters of

Table 2 Consumption of nutrients in pouch patients and healthy controls (mean \pm SD)

Nutrient	Consumption healthy controls (<i>n</i> = 80)	%DRI	Consumption pouch patients (<i>n</i> = 80)	%DRI	<i>P</i> value
Energy (kcal)	2655.2 \pm 1313.7	-	2509.9 \pm 986.4	-	0.430
Proteins (g)	112.8 \pm 59.4	200%	113 \pm 42.5	201%	0.977
Total fat (g)	84.4 \pm 39	-	97.6 \pm 40.5	-	0.038
Carbohydrates (g)	369.0 \pm 215.2	284%	305.5 \pm 141.4	234%	0.029
Theobromine (mg)	236.6 \pm 244.5	-	77.8 \pm 100	-	< 0.001
Total sugars (g)	157.5 \pm 90.4	-	124 \pm 76.2	-	0.012
Total dietary fiber (g)	30.7 \pm 14.0	80%	26.2 \pm 15.4	69%	0.055
Zinc (mg)	13.3 \pm 6.5	121%	16.6 \pm 9.2	151%	0.01
Retinol (μ g)	832.4 \pm 609.6	-	474.4 \pm 337.1	-	< 0.001
Vitamin D (μ g)	7.9 \pm 5.7	158%	15.7 \pm 19.9	314%	0.001
Vitamin C (mg)	148.2 \pm 80.6	164%	210.3 \pm 225.4	233%	0.022
Niacin (mg)	34.4 \pm 20.0	212%	43.0 \pm 18.1	269%	0.005
Total monounsaturated fatty acids (g)	30 \pm 14	-	38.4 \pm 16.4	-	< 0.001
Total polyunsaturated fatty acids (g)	17.9 \pm 9.2	-	20.4 \pm 9.2	-	0.082
Total saturated fatty acids (g)	28.0 \pm 14.1	-	30 \pm 15.5	-	0.006
Total W3 fatty acids (g)	0.14 \pm 0.13	-	1.2 \pm 3.4	-	0.03
Total W6 fatty acids (g)	16.8 \pm 9.0	-	19.9 \pm 9.1	-	0.4

DRI: Dietary reference intakes.

Table 3 Demographic characteristics of pouch patient subgroups

	Normal pouch (<i>n</i> = 23)	Recurrent acute and chronic pouchitis (<i>n</i> = 45)	<i>P</i> value
Male/female	11/12	22/23	0.56
Age (yr)	53.2 \pm 13.7	43.0 \pm 14.9	< 0.001
Mean time since surgery (yr)	7.8 \pm 4.4	11.0 \pm 6.3	0.04
Operation stages (1/2/3)	4/16/3	4/34/7	0.4
Body mass index (kg/m ²)	27 \pm 4.9	22.6 \pm 3.2	< 0.001
Food avoidance	60.90%	73.30%	0.21
Probiotics consumption	30.40%	31.10%	0.6
Vitamins/supplement consumption	43.50%	66.70%	0.06
Smokers	4.30%	13.30%	0.24

the two groups are shown in Table 3. Comparison of the food consumption of the normal pouch patients to that of patients with pouchitis revealed significant differences in two main food groups; namely, fruits and vegetables (Table 4). Patients with a normal pouch consumed twice as many fruit servings as patients with pouchitis ($P < 0.01$) and tended to consume more vegetable servings than the pouchitis patients ($P < 0.01$). The consumption of other food groups was comparable regardless of pouch status. We hypothesized that these findings would be reflected in significantly less consumption of antioxidants. As predicted, pouchitis patients consumed significantly less liposoluble antioxidants, such as cryptoxanthin and lycopene, as well as less vitamins A and C than the normal pouch patients. Taken together, these data suggest that patients with pouchitis may be more exposed to oxidative stress as a result of their consumption of fewer fruits and vegetables. Interestingly, two-thirds of the patients with pouchitis supplemented their diet with vitamins and minerals, compared to 43.5% of the patients with a normal pouch ($P = 0.06$). Nevertheless, even after this supplementation, the total consumption of antioxidants was still significantly lower in the pouchitis group than in the normal pouch group. Seventy percent of all pouch

patients reported some type of food avoidance. The most frequently avoided foods were milk, citrus fruits, and spicy foods. Although up to 25% of all pouch patients avoided milk products, they met the recommended calcium intake level, mostly through supplements.

Only 26.2% ($n = 21$) of all pouch patients in the cohort used probiotics; 30.4% ($n = 7$) in the normal pouch group and 31.1% ($n = 14$) in the pouchitis group. Most of these were over-the-counter probiotics, and only 4 patients used the probiotic VSL#3.

BMI comparisons

Despite the comparable mean energy intake of patients with normal pouches and those with pouchitis, the mean BMI of both groups was significantly different, with the former having a significantly higher BMI than the latter. In terms of the normal BMI range for the healthy population (18.5-25 kg/m²)^[26], 15 patients (65%) in the normal pouch group fell into the overweight range compared to 35 patients (77%) the pouchitis group who were categorized in the normal or underweight range. This may suggest that inflammatory activity itself, rather than decreased caloric intake, plays a role in the significantly lower BMI of patients with pouchitis.

Table 4 Food group consumption in patients with recurrent acute and chronic pouchitis vs patients with a normal pouch (mean ± SD)

Food group	Consumption normal pouch patients (n = 23, servings/d)	Consumption recurrent acute and chronic pouchitis patients (n = 45, servings/d)	Recommendation ¹	P value
Grains	7.0 ± 3.5	7.3 ± 4.5	6-11 ²	0.7
Bakery	1.0 ± 1.4	1.2 ± 1.3	6-11 ²	0.4
Potatoes	0.5 ± 0.4	0.8 ± 0.6	6-11 ²	0.15
Vegetables	4.5 ± 3.0	3.3 ± 2.1	3-5	0.06
Fruits	3.6 ± 4.1	1.8 ± 1.7	2-4	0.015
Dairy	4.3 ± 3.0	3.7 ± 3.0	2-3	0.43
Meat, fish and poultry	2.4 ± 1.5	2.4 ± 1.8	2-3 ³	0.99
Eggs	0.6 ± 0.5	0.5 ± 0.4	2-3 ³	0.37
Legumes	0.2 ± 0.4	0.3 ± 0.5	2-3 ³	0.28
Oils and fats	5.3 ± 3.0	4.7 ± 3.8	Limited	0.5
Nuts and seeds	0.4 ± 0.8	2.3 ± 0.4	Limited	0.55
Snacks and soft drinks	4.4 ± 3.0	5.5 ± 5.0	Limited	0.38
Water	6.0 ± 3.9	6.0 ± 3.5	-	0.93

¹Serving recommendations according to food pyramid (n = 20); ²6-11 servings are recommended for the grains, baked goods or potato categories; ³2-3 servings are recommended for the meat, fish and poultry, eggs, and legume categories.

Table 5 Consumption of nutrients in patients with recurrent acute and chronic pouchitis vs patients with a normal pouch (mean ± SD)

Nutrient	Consumption normal pouch patients (n = 23)	%DRI	Consumption recurrent acute and chronic pouchitis patients (n = 45)	%DRI	P value
Energy (kcal)	2592.7	-	2538.2	-	0.836
Proteins (g)	117.9	210%	113.1	201%	0.667
Total fat (g)	98.2	-	99.5	-	0.882
Carbohydrates (g)	321.3	247%	307.3	236%	0.709
Vitamin A-RAE (µg)	1237.5 ± 728.0	137%	893.3 ± 516.0	99%	0.027
Beta-carotene (µg)	7180.5 ± 7394.1	66%	4453 ± 4960.6	41%	0.075
Cryptoxanthin (µg)	890.1 ± 1296.8	-	399 ± 485	-	0.027
Lycopene (µg)	10725.7 ± 10065.9	-	6533.1 ± 6065.7	-	0.036
Vitamin C (mg)	285.3 ± 326.3	316%	153.35 ± 130	170%	0.02

RAE: Retinol activity equivalents; DRI: Dietary reference intake.

DISCUSSION

Increased attention has been paid in recent years to the role of nutrition in the treatment of IBD patients^[4,27], and its putative contribution to inflammation continues to be a topic of considerable interest^[14,15]. UC patients undergoing pouch surgery are exposed not only to the consequences of total removal of the large bowel and reconstruction of an ileal reservoir, but also to the potential influence of nutrition on inflammatory processes. Thus it is surprising that there are no nutritional guidelines for these patients. Moreover, there is only sparse information on nutrition among pouch patients and its relationships to the development, treatment, and prevention of pouch inflammation. In this prospective cross-sectional study, we employed the FFQ to characterize pouch patients' dietary consumption to analyze correlations between diet and pouch inflammation. We hypothesized that nutrition could be significantly impaired in these patients, which would have possible implications for the inflammation of the pouch.

The results indicate major differences in the diet of pouch patients as compared to healthy individuals and, more importantly, between patients with normal pouches and those with pouchitis. In particular, pouch patients

consumed significantly higher servings of fats and oils compared to healthy controls, and patients with pouchitis consumed fewer fruit servings and antioxidants than patients with a normal pouch. These findings on fat and oil consumption may be crucial since USDA nutritional guidelines recommend that fats should be consumed sparingly^[20,28]. Sakamoto *et al.* for instance found that high consumption of fats and oils is associated with increased risk of CD^[12]. The same may apply to the development of pouchitis, which, similar to CD, is an inflammation of the small bowel in an IBD patient.

Our patients with normal pouches consumed twice as many servings from the fruit food group than the pouchitis patients (Table 4). They also tended to consume more servings from the vegetable food group. Low consumption of fruits and vegetables has been shown to be inversely related to inflammation, as reflected by higher CRP levels^[29]. El Muhtaseb *et al.*^[10] for instance showed that pouch patients have significantly lower plasma concentrations of liposoluble antioxidants such as beta carotene, and that they have increased oxidative stress in plasma compared to healthy controls. This may imply that the low consumption of antioxidants and vitamin C observed in the pouchitis patients here may contribute to their low serum levels. According to D'Odorico *et al.*^[30]

this may lead to further oxidative damage. When DRI consumption of dietary fibers is below the recommended level, several mechanisms may lead to a similar effect^[31]. Intestinal bacteria ferment soluble fibers, producing short chain fatty acids such as butyrate^[31,32] as well as lactic acid^[32]. A shortage in butyrate was shown to be associated with the development of pouchitis^[32]. Second, lactic acid decreases fecal pH^[31], which may contribute to protection from pouchitis^[31] by inhibiting the proteolytic activity of bacterial glycosidases^[33].

Taken together, these results on the low consumption of antioxidants, vitamins and dietary fibers by pouchitis patients support our hypothesis that these imbalances may both predispose and be associated with the development of pouchitis in pouch patients. Whether the consumption of more antioxidants and vitamins can prevent further intestinal inflammation or even reverse it is an open question reserved for future studies. Notably, probiotic supplements were consumed by 26.2% of our pouch patients, but the probiotic formula VSL#3 that has been reported to be beneficial for the prevention of pouchitis^[34] was consumed by only 5%. This low rate of use may change in the near future since 2011 VSL#3 has now been included in the Israeli MOH health basket as a supplement for patients with pouchitis^[35].

A major finding of the current work is the correlation between BMI and the inflammatory state. Patients with normal pouches had significantly higher BMI ratios than patients with pouchitis, even to the point of being in the “overweight” range^[26]. This finding is intriguing given that there was no difference in energy intake between the normal pouch and the chronic pouchitis patient groups. Thus, differences in BMI might be due to increased malabsorption^[3], increased energy expenditure^[3] or differences in microbiota composition, which may lead to differential utilization of nutrients^[36]. This correlation between BMI and pouch inflammatory state also suggests that the inflammation itself contributes to energy expenditure, as we reported elsewhere for CD patients^[3].

In conclusion, the results of this study revealed significant differences in the consumption of food groups and nutrients between healthy controls and pouch patients, and between patients with normal pouches and those with pouchitis. These differences correlated, in part, with pouchitis and affected the patients’ BMI levels. Further studies on the mechanistic effects of nutrition on pouch inflammation are needed to help provide guidelines for nutritional counseling and interventions to alleviate the symptoms of pouchitis and modify its course.

COMMENTS

Background

Total proctocolectomy and the formation of a small bowel reservoir-ileal pouch anal anastomosis (IPAA, “pouch surgery”) is the surgery of choice for the treatment of severe, refractory or complicated ulcerative colitis (UC). Inflammation of the pouch (“pouchitis”) is the most common long-term complication, with a reported incidence of up to 60%. Nutrition has been increasingly incorporated into the management of inflammatory bowel disease (IBD). However, few studies have assessed the influence of nutrition on the health of pouch patients.

Moreover, the potential contribution of nutrition to the development of inflammation in the pouch, as well as in IBD in general, remains under-researched.

Research frontiers

The characteristics of pouch patients’ nutrition were prospectively evaluated using a food frequency questionnaire. The questionnaire data were analyzed for correlations between pouch disease behavior, as determined by clinical, endoscopic and histological criteria. Most previous nutritional studies on pouch patients have focused on their subjective feelings after consuming specific food products rather than on the overall relationships between various food groups and nutrients and pouch disease behavior.

Innovations and breakthroughs

The dietary intake and nutrient composition of pouch patients was analyzed for relationships with pouch disease behavior. The key finding shows that the diet of patients with pouch surgery differed significantly from that of healthy individuals. Moreover, patients with pouchitis consume significantly fewer fruit servings and antioxidants compared to patients with normal pouches, possibly exposing the former to inflammatory and oxidative stress. The body mass index of patients with pouchitis was significantly lower than patients with normal pouches, probably as a result of the continuous inflammatory burden.

Applications

The findings suggest that the consumption of fruits and vegetables, as well as supplementation with specific vitamins, minerals and antioxidants may be beneficial for patients with pouchitis. Specific nutritional consultation for pouch patients is advisable.

Terminology

Pouch surgery: This is the surgery of choice for the treatment of severe, refractory or complicated UC. The large bowel and the rectum are removed (total proctocolectomy), and a reservoir (“pouch”) constructed of the normal small bowel is created and connected to the anus (IPAA). Pouchitis: Inflammation of the small bowel (that was originally normal, not inflamed) creating the pouch.

Peer review

This research compares the dietary and nutritional treatment of pouch patients and pouchitis. This manuscript is a meaningful and enlightening study in general because it reveals the dietary differences between pouch patients and controls as well as between patients with or without pouchitis, which can guide further investigations on this topic.

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P- Reviewers Bashashati M, Chen JL, Kim YJ **S- Editor** Gou SX
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ISSN 1007-9327



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