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Nutritional profile and consumption of inflammatory and anti-inflammatory foods by patients treated in a psoriasis outpatient clinic of a health-school unit in Itajaí, SC, Brazil

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Abstract

Psoriasis is a hereditary inflammatory skin disease mediated by T cells that may suffer environmental influences. Psoriasis and obesity have a common underlying pathophysiology, suggesting that obesity follows psoriasis, not the contrary. Furthermore, there is evidence that certain nutrients with anti-inflammatory function can assist in the treatment of psoriasis. This study aimed to evaluate the nutritional status and food intake of inflammatory and anti-inflammatory patients with psoriasis seen at a Health-School Unit of Itajaí-SC, from May to August 2014. The assisted patients were evaluated through a semi-structured questionnaire with identification, socioeconomic, lifestyle habit and frequency of (inflammatory and anti-inflammatory) food consumption data, and an assessment of the nutritional status was carried out . A statistical analysis was performed using STATA 13.0 and the association between the categorical variables was evaluated by Pearson's chi-square test or Fisher's exact test. Overweight prevailed in 61% of the patients, 22% were overweight and 39% were obese. The results demonstrate that garlic (97%) and olive oil (53%) were anti-inflammatory foods consumed more frequently, while others had lower food consumption. When asked about the use of inflammatory foods, the most mentioned ones were beef, with 58%, followed by coffee (45%); other foods showed no relevant consumption. Considering the magnitude of the studied subject, it is essential to develop researches and studies related to the nutritional status of patients diagnosed with psoriasis and to determine the consumption of foods that can help to improve the treatment of this pathology.

Keywords: Psoriasis. Food. Nutritional Status. Inflammation.

Introduction

Psoriasis is a chronic, inflammatory, self-immune disease, with multifactorial etiology and a strong genetic basis; it affects the skin, nails, mucosa and joints.[1] For Silva & Silva,[2] it is characterized by a erythematous scaly plaque, protruding in relation to the skin surface. Its scales are overlaid as blades of a mica fragment; they are red and may be easily removed, by scraping the lesion. According to Miot,[1] psoriasis affects in average 0.2% to 4.8% of the worldwide population. In Brazil, it is estimated that about 2.5% of its inhabitants are affected by the disease.[3,4]

The inadequacy of the food standard, physical inactivity and emotional factors may have a triggering role for the development of psoriasis and associated chronic non-communicable diseases (CNCDs), as well as to promote the inflammatory process. Therefore, nutrition may influence psoriasis in two different ways: as the cause of metabolic dysfunctions or as treatment and prevention.[4.]

Being unaware of the importance of foods, of making regular meals, the large variety of ready-made meals with excessive calories and carbohydrates, and the lack of determination to conciliate work schedules and eating habits are factors that, for these patients, contribute to obesity, nutritional deficiency and to worsen psoriasis.[5] According to Sterry, Strober & Menter,[6] psoriasis and obesity have a common underlying physiopathology, suggesting that obesity follows psoriasis, and it does not precede it, indicating that the psoriasis inflammation contributes for the obese condition, and both share cytokines that lead to the metabolic syndrome standard.

Dieting is an important factor for the psoriasis pathogenesis, and there is evidence in literature that certain nutrients have a major influence on this pathogeny, such as, for example, the omega 3 fatty acid, a potent anti-inflammatory agent. It may be successfully used to treat inflammatory diseases, showing improvements to the clinical condition and a significant contribution to reduce the lesions of patients.[7,8]

Considering this, the objective of this research was to evaluate the nutritional status and intake of inflammatory and anti-inflammatory foods by patients with a psoriasis diagnosis assisted at a Health-School Unit at Itajaí-SC.

Methodology

This is a transversal and descriptive study, constituted by individuals assisted by a psoriasis outpatient clinic of a Health-School Unit in the municipality of Itajaí-SC from May to August 2014. The project was approved by the Ethics Research Committee of UNIVALI, under number 609.707.

In order to be part of the research, the individuals should be 20 years old or over, they should had been assisted by the psoriasis outpatient clinic with a confirmed diagnosis, accept being part of the research and sign the Free and Clear Consent Term (FCCT). Individuals with the following conditions could not participate: psychiatric or neurocognitive condition that would prevent obtaining reliable clinical data (defined by the clinical judgement of the investigated individuals); pregnancy or lactation, individuals with difficulties in eating orally, individuals in wheelchairs; having undergone gastroplasty or organ transplant and having a kidney insufficiency diagnosis with dialysis indication.

The data collection was conducted by the researchers, and it covered the aspects related to identification, socioeconomic characteristics, lifestyle and health habits. In order to evaluate these items, a semi-structured questionnaire was applied as an interview, containing questions related to identification, socioeconomic data (income and schooling level), according to a preliminary standard by the Brazilian Association of Research Companies (ABEP)[9] and data related to lifestyle habits (practice of physical activities and smoking).

The nutritional status was evaluated by verifying the body weight (kg) using a digital scale, with capacity for 150 Kg, and the individuals were evaluated with light clothes and no shoes, standing, in the middle of the scale platform. The height (cm) was measured using a stadiometer connected to the wall with a scale in millimeters (mm), with the individual on the orthostatic position. For the nutritional diagnosis, the body mass index (BMI) and the classification were used according to the criteria suggested by the Health Ministry.[10] For statistical purposes, the diagnoses were grouped as low weight and eutrophia, overweight and obesity. Finally, the intake of inflammatory and anti-inflammatory foods was evaluated, through a food intake questionnaire of a semi-quantitative nature, containing the main foods shown in the literature.[4,5] They were divided into three intake categories: ≥3x a week, < 3x a week, no intake, and they were then charted and shown as intake percentage.

The research results were charted with the assistance of Microsoft Excel®, and the statistical analysis was conducted using STATA 13.0®. The quantitative variables were calculated as averages and standard deviations. The categorical variables were described through their absolute and relative frequencies. The association among the categorical variables was tested using Pearson's chi-square test Pearson, or Fisher's exact test. The differences were considered as significant when $p \leq 0.05$.

Results and discussions

In order to conduct the study, 41 of the 55 patients registered at the outpatient clinic were approached, but only 36 accepted to be part of the research, from which, 53% (n= 19) were males. The average age was 52 years old (28 years old was the minimal age, and 74 years old, the maximal age). It was also observed that only 11% (n= 4) of the patients live by themselves. Most of them is married or live with a stable partner, totaling 64% (n= 23). In relation to the Family history regarding psoriasis, most of them, 78% (n= 28), report that there are no cases of the disease on their families. Exactly 50% (n= 18) of the interviewees work, while the other half has been away from work or is retired.

A study conducted by Mignorance et al.,[11] when evaluating the psychosocial adaptation of patients with psoriasis, observed the relationship between the disease and some difficulty on psychosocial relations, including the insertion of these people on the job market. The authors also observed that the higher the extension and severity of the lesions, the greater the damage to daily activities, leisure and general quality of life of these patients. That could explain the high percentage of individuals that are away from work or retired (50%) found on this study.-

Even aware of the health risks, 17% (n= 6) of the patients smoke, 30% (n= 11) say they have quit smoking; 66% (n= 24) of the approached individuals do not have any type of alcoholic beverages. Among the 36 researched individuals, 58% (n= 21) of them do not practice physical activities, and 69% (n= 25) see themselves as being stressed or nervous.

Camerin & Cestari,[12] when evaluating psoriasis as a risk factor associated with the development of depression, smoking, and alcoholism, observed similar data to the ones found on this study, where smoking was reported by 22% of the patients. 36% of the individuals reported they were former smokers, and 32% were depressed. A study conducted by Souza et al.[13] indicated that the factors mentioned as triggers or promoters of skin diseases refer to stress situations, and most of them is related to loss and separation in all areas of life – that is, the fact that or individual is stress or nervous, as found on this study, may be a trigger or make psoriasis more severe. There was no significant association between stress and smoking (p=0.38), or work (p=0.12).

Changes in weight were found in 67% (n= 24) of the patients, from which, 58% (n= 14) reported weight gain, and 42% (n= 10) reported weight loss, and an association between this variable and stress was not found (p=0.63). Gisondi et al.[14] point out that the weight gain in patients with psoriasis may be part of triggering the disease, based on the pro-inflammatory condition, or it could also be a consequence of psoriasis, due to metabolic deregulations, induced by the pro-inflammatory condition, added to the damage on the quality of life and food intake habits of those who have this disease.

When evaluating the nutritional status, it was observed that 3% (n= 1) of the patients were underweight, 36% (n= 13) were eutrophic, 22% (n= 8) were overweight, and 39% (n= 14) were obese. Also according to Gisondi et al.[14], the metabolic syndrome is significantly more common in patients with psoriasis, with higher prevalence of hypertriglyceridemia and abdominal obesity.

Duarte et al.[15] state that it is likely that there is a relationship between psoriasis and metabolic changes and/or obesity, with higher morbi-mortality and hospitalization of affected patients, pointing out the need for a multidisciplinary approach to conduct the patient with psoriasis, mainly in relation to the current and future therapies.

Although nutrition is considered a tool to treat psoriasis, there is no standard, whether national or international, that establishes an adequate food intake for these patients. Some authors suggest that several active ingredients of the Brazilian foods have important roles on the physiopathogeny of psoriasis, with the same magnitude that controlling the energetic basis of the diet and the intake of total and saturated fats contribute to control CNCDs.[4]

Among these nutrients, some vitamins and minerals are mentioned (vitamin A, E, C and D, and folic acid), polyunsaturated fatty acids (omega 3), in addition to diets with low caloric density. It is believed that these vitamins and minerals (iron, copper, manganese, zinc and selenium) have an antioxidant capacity, reducing the oxidative stress and the production of oxygen-reactive species, above all in the presence of systemic inflammation, such as the case of psoriasis.[8,16]

Considering the fact that psoriasis is an inflammatory disease and some foods have an anti- or pro-inflammatory effect, foods may, at the same time, prevent and treat, or develop and aggravate the disease, making nutrition a determining fact to treat psoriasis.[4,5]

Chart 1 shows the data related to the intake frequency of anti-inflammatory foods. The results shows that garlic (97%; n= 35) and olive oil (53%; n= 19) were the most frequently consumed anti-inflammatory foods (3 or more times a week), while the other foods were less frequently consumed by most of the studied population.

Chart 1 – Intake frequency of anti-inflammatory foods by patients affected by psoriasis. Itajaí-SC, 2014.

Foods	Intake 3 or more times a week		Intake 3 or less times a week		No intake	
	N	%	N	%	N	%
Salmon	0	-	5	14	31	86
Sardine	2	6	15	41	19	53
Tuna	0	-	8	22	28	78
Nuts	10	28	6	17	20	55
Chia seeds	5	14	4	11	27	75
Green tea	5	14	4	11	27	75
Olive oil	19	53	9	25	8	22
Canola oil	4	11	2	6	30	83
Ginger	6	17	8	22	22	61
Guava	4	11	11	31	21	58
Garlic	35	97	0	-	1	3
Sweet potato	7	19	23	64	6	17
Pumpkin	5	14	21	58	10	28
Purple yam	1	3	5	14	30	83
Red pepper	9	25	9	25	18	50
Honey	14	39	4	11	18	50
Propolis	3	8	2	6	31	86

The frequent intake of garlic by the patients on this research is an important finding, since, according to Lee et al.[17] (2012), four anti-inflammatory components have already been found on this food, specifically acting to inhibit the production of nitric oxide and prostaglandins, the expression of the tumor necrosis factor, and of interleukins, all of which are a major part of an inflammation.

Extra virgin olive oil, the second most consumed food, has a substance called oleocanthal, with an anti-inflammatory action, in addition to containing phenolic compounds,[18] which are powerful antioxidants and fight oxidative stress.[19]

From the three fishes analyzed on the questionnaire, all with a high omega 3 content, only sardine stood out. It is noteworthy that this nutrient has an anti-inflammatory capacity, traditionally attributed to the inhibition of the formation of eicosanoids, which are part of the inflammatory process.[20]

Red pepper, which has a high carotenoid content and antioxidant, analgesic and anti-inflammatory effect, was frequently consumed by 25% of the patients, which could greatly benefit these patients.

Pumpkin, which was occasionally consumed by the patients, also has great anti-inflammatory, antioxidant and anti-diabetes capacity, since it contains linolenic, oleic, and palmitic acids and flavonoids,[22] in addition to being an ordinary food with accessible price.

Another food that is not frequently consumed, and which is currently widely promoted, with great anti-inflammatory, antioxidant and even anti-lipogenic capacity, is sweet potato, whose antioxidant effect was attested *in vitro* and its anti-inflammatory power occurs by inhibiting interleukin-6.[23]

Nuts were frequently consumed by 28% (n=10) of the patients, but 55% (n=20) of them do not eat them, maybe due to their cost. However, it is noteworthy that this food has chemical compounds such as phytosterols, selenium and tocopherols, which promote its antioxidant action that inhibits the oxidative stress[24] – and it has been used to attenuate the oxidative stress in inflammatory diseases.[25]

The other foods had no significant intake, but they show important anti-inflammatory abilities that must be pointed out, such as *Salvia hispanica L.*, widely known as chia, and canola oil, which deserve to be highlighted, since, in addition to several other properties, they contain omega-3, which is famous for its anti-inflammatory ability.[26,27]

Green tea, if habitually consumed, would greatly benefit these patients, since it has a high polyphenol content and a great antioxidant and anti-inflammatory ability.[28] Guava, which has a high polyphenol content, with antioxidant, anti-microbial and anti-inflammatory ability, was consumed by only 11% of the participants.[29]

A food that may be used in several preparations, such as juices, salty and sweet dishes, but which is poorly used among the patients, is ginger. According to a study conducted in India by Jeenak, Liju & Kuttan,[30] when tested in rats, ginger showed an increase on the blood of superoxide dismutase, glutathione and glutathione reductase, in addition to glutathione-S-transferase, glutathione peroxidase and superoxide dismutase, on the liver, showing a significant reduction on chronic inflammation.[31]

Yam (or purple yam) was one of the less consumed foods by the patients; however, according to Jin et al.,[32] it is powerful against inflammatory diseases, due to its ability to inhibit compounds such as ciclioxigenase-1 (COX-1) and lipoxigenase-5 (LOX-5), that depend on the production of leukotriene C.

Honey, propolis and royal jelly were widely used during the Antiquity with medicinal purposes. This behavior is justified by the fact that they have biological properties, such as anti-tumor, antimicrobial, anti-inflammatory capacities, immune-modulatory effects among others;[33] however, although honey was frequently consumed by 39% of the patients, the consumption of propolis was considerably reduced.

When asked regarding the consumption of inflammatory foods three or more times a week, the most mentioned food was cattle meat, with 58% (n=21), followed by coffee (n=16) 45%, as it may be observed on chart 2, which shows data related to the intake of pro-inflammatory foods.

As to the foods with no intake during the week, the most mentioned ones were: monosodium glutamate, with 97% (n=35); black tea, with 89% (n=32) and mate, with 64% (n=23).

Most of the interviewees denied the consumption of some of the inflammatory foods, such as black tea and monosodium glutamate, with 89% (n= 32) and 97% (n= 35) of rejection, respectively, as it may be observed on chart 2.

Chart 2 – Intake frequency of pro-inflammatory foods by patients affected by psoriasis. Itajaí-SC, 2014.

Foods	Intake 3 or more times a week		Intake 3 or less times a week		No intake	
	N	%	N	%	N	%
Black coffee	16	45	3	8	17	47
Black tea	2	6	2	6	32	89
Mate	9	25	4	11	23	64
Chocolate	9	25	13	36	14	39
Cured foods	7	19	16	45	13	36
Pepper	10	28	7	19	19	53
Cattle meat	21	58	14	39	1	3
Monosodium glutamate	1	3	0	-	35	97

Corroborating with the results of this study, Festugato et al.[5] verified that cattle meat was also the most consumed food by patients with psoriasis, and what sets it apart from other meats is the high iron content, which would be involved in the synthesis of hydroxyl radicals, damaging the bowel cells. Cooked or roasted meats lose water during their preparation, increasing their fat and protein content, and their caloric value. Meat preparation methods that use high temperatures and low humidity (frying, roasting, grilling) contribute to the high dietetic content of AGEs – Advanced Glycated End-Products – end products of advanced glycation, which damage the cells and connect to specific receptors, causing the production of inflammatory cytokines and growth factors.[34-36]

There are still few studies that approach the implications of AGEs on skin diseases, such as psoriasis, but it may be inferred that cooked or roasted meats lose water during the culinary preparation, increasing the fat and protein content, and making the sources of pro-inflammatory AGEs.[34,37]

The second most consumed food was coffee. There is a great amount of caffeine on it, whose main mechanism of action is due to its structural similarity with the adenosine molecule, and it may connect to its receptors (A1, A2A), blocking them and, consequently, having a stimulating effect.[38] Caffeine, which has pro-inflammatory effects, when administered after an acute inflammatory process in rats, increased the attested tissue damage due to an increase in the RNAm levels of TNF-alpha, TNF-beta, lymphotoxin beta, IL-6 and IFN-gamma cytokines on the spleen, and increase of IFNgamma on the peripheral blood.[39] Cytokines, such as IFNgamma, act as mitogens for keratinocytes in psoriasis.[40]

On a study conducted by Festugato,[6] foods such as pepper, coffee and teas (caffeine), monosodium glutamate, cattle meat and smoked foods were removed from the diet of patients with psoriasis, which were then introduced to healthy habits, showing an improvement of the treatment. In addition, it was observed that the patients that did not have an adequate diet, due to lack of information on the relevance of nutrition, had an aggravation of psoriasis.

In addition to the intake of foods mentioned above, which may interfere in the treatment of psoriasis, other factors may promote its evolution, such as environmental factors, which influence the course and susceptibility of the development of the disease, including chronic inflammations, stress, drugs (beta blockers, lithium, interferon and anti-malaria agents), smoking and obesity.[41]

Both poor nutrition and inflammation are strongly associated to one another and may change the nutritional situation of the individual, resulting on the same inflammatory direction.[42,43] Thus, nutritional care in patients with psoriasis, combined with controlling the biochemical and anthropometric variables, assures greater clinical stability to these individuals, preventing CNCDs commonly associated to the disease and offering greater longevity and quality of life.[44]

Final considerations

From the studied patients, most of them had a compromised nutritional status (overweight and obesity), increasing the risks for chronic diseases related to obesity. The poor quality of life may also interfere to aggravate the lesions. As to the intake of foods, the high intake of garlic, followed by olive oil, is a positive factor to improve psoriasis, but it is noteworthy that a healthy nutrition is not related to only one type of food or isolated nutrient.

Even though it is not possible to quantify the reduction of the scales and to show its correlation to the nutritional change, it may be stated that removing the pro-inflammatory foods, as well as introducing healthy nutritional habits and improving the nutritional state may contribute with better results for the treatment and, consequently, to increase the self-esteem of the patients.

Searching for a multifactorial treatment is highly important, since the professionals from several areas (physician, psychologist and nutritionist) may promote quicker well-being for the patient.

Some limitations of this paper are the reduced number of studied individuals, as well as the scarce theoretical references on the theme. Therefore, considering the magnitude of the problem, it is essential to develop further research that cover a larger number of participants and relate the nutritional state of patients diagnosed with psoriasis to the intake of foods that may assist in improving this pathology.

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