

Interest of Brewer's Yeast-Exclusion Diet in the Management of Hidradenitis Suppurativa

Colboc H¹, Fite C¹, Cannistra C², Chaby G³, Maillard H⁴, Bouscarat F¹, Crickx B¹, Gabison G⁵, Ezzedine K⁶, Descamps V^{1*} and Resopso GEM¹

¹Department of Dermatology, Centre Hospitalier Universitaire Bichat-Claude Bernard, Paris, France

²Department of Surgery, Centre Hospitalier Universitaire Bichat-Claude Bernard, Paris, France

³Department of Dermatology, Hôpital Sud, Centre Hospitalier Universitaire d'Amiens, Picardie-Jules Verne University, Amiens, France

⁴Department of Dermatology, Centre Hospitalier du Mans, Le Mans, France

⁵Saint Maurice, France

⁶Department of Dermatology, Groupe Hospitalier Pellegrin, Bordeaux, France

*Corresponding author: Vincent Descamps, Department of Dermatology Bichat Claude Bernard Hospital, Paris Diderot University 46 rue Henri Huchard 75877 Paris, France, Tel: 33-140257300; Fax: 33-140257303; E-mail: vincent.descamps@bch.aphp.fr

Received date: July 04, 2016; Accepted date: September 17, 2016; Published date: September 22, 2016

Copyright: © 2016 Colboc H, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Abstract

Background: Usual treatments are poorly effective in Hidradenitis Suppurativa (HS).

Objectives: We prospectively evaluated the interest of brewer's yeast exclusion diet in HS and its feasibility and acceptability

Methods: Patient and HS characteristics, associated treatment, adherence to the diet and weight evolution were evaluated in twenty patients for a 3-month-period by a double standardized questionnaire (patient and dermatologist)

Results: Compared to inclusion, pain ($p=0.006$), number of impaired days due to the disease within the previous month ($p=0.007$), intensity of inflammation ($p=0.018$) and discharge intensity ($p=0.005$) were significantly lower after the three months diet.

Conclusion: This prospective study shows that brewer's yeast exclusion diet is a feasible, non-invasive and effective way to treat HS and could be considered as an adjunctive treatment to control or reduce the number of flare of the disease.

Keywords: Hidradenitis suppurativa; Brewer's yeast

Introduction

Hidradenitis suppurativa (HS) is a chronic, recurrent, inflammatory skin disease characterized by painful abscesses, fistulising sinus tracts, and scarring [1]. The disease usually affects skin that bears apocrine glands. Most of patients have an age-of-onset 11 and 30 years. Females are more prone to develop the disease (sex ratio F/M: 3/1). The disease is not rare and its prevalence has been estimated at up to 4% in young adults [2]. Most of observational studies have reported concordant risk factors for HS of which the most consistent are smoking and obesity [3]. In addition, a family history of HS is reported in one third of patients, with a probable autosomal dominant mode of transmission, and familial forms of HS have been linked to the mutations of the gamma-secretase complex which are part of the Notch inflammatory pathway [4-6]. However, despite recent advances the exact pathophysiology remains to be elucidated. Clinically, deep-seated inflammation of hair follicles and perifolliculitis in skin bearing apocrine glands induced formation of nodules, abscesses, and sinus tracts. Treatment options for HS include topical treatments (surgery, topical antibiotics), oral antibiotics, anti-androgens in women, zinc

supplementation, retinoids, and more recently TNF alpha inhibitors) [7]. Lifestyle measures, as smoking cessation, and weight loss have also been proposed [8].

Recently brewer's yeast exclusion diet has been proposed for the management of HS because some patients reported an immediate stabilization of their manifestations after exclusion of brewer's yeast and a new flare after its reintroduction [9]. These patients were tested positive for circulating antibodies against *Saccharomyces cerevisiae* (anti-*Saccharomyces cerevisiae* antibodies: ASCA) which is the main component of brewer's yeast. Strikingly, ASCA are often observed in patients with active Crohn's disease with anal fistulae [12] and brewer's yeast consumption has been found to induce flare-up in patients with stable Crohn's disease [13]. Moreover, various studies have underlined the association between HS and Crohn's disease [10,11] and differential diagnosis between these two diseases might be difficult in patients with perineal lesions.

In this context, we thought to set-up a study with the primary aim to evaluate the interest of brewer's yeast exclusion diet in HS and to assess the feasibility and acceptability of such diet.

Patients and Methods

This was a prospective transversal multicenter study. The study was approved by the Commission Nationale Informatique et Libertés (CNIL), a French regulatory authority that allows the constitution of a database.

Study procedure

The study was proposed to consecutive patients with HS aged 18 years or older and attending one of the 5 French dermatological centres between January 1st and April 1st 2013.

Although treatment was left to the appreciation of the dermatologist, we advised no modification of the initial therapy or in case of cessation of the previous treatment no new medical treatment.

Patients were assessed at inclusion and three months after receiving advices for a brewer's yeast free diet.

Study population

Inclusion criteria were patients with active HS, with more than 6-month-history of chronic and recurrent abscesses with scars on typical HS localisations. All patients who gave their oral consent to participate in the study were advised to undergo brewer's yeast diet exclusion with clear instructions on how to conduct such a diet during a three months period (Table 1).

Food not allowed
All type of bread
Pizza
Pastries, brioche
Beer, wine
Fermented cheese

Table 1: Guideline for brewer's yeast exclusion diet.

Evaluation of patients characteristics

For each patient, a detailed descriptive questionnaire specifically designed for the study was completed at inclusion by the referent dermatologists. This questionnaire included demographic data (age, sex), components of metabolic syndrome (presence or absence of type 2 diabetes mellitus, dyslipidemia, high blood pressure, weight, size, and waist circumference), smoking habit (number of smoked cigarettes within the last month), co-morbidities (psoriasis, Crohn's disease, and others), HS personal history including age of onset, familial history of HS, affected areas, specific associated conditions (acne conglobata, pilonidal cyst), and treatment.

Evaluation of HS severity and adherence to the diet

In addition, patients were assessed with lesion severity scores at inclusion and three months after receiving advices for a brewer's yeast free diet. These scores included patient and physician evaluations. Two items were evaluated by the patient: pain within the previous month, using a numeral rating scale, from 0 (no pain) to 10 and the number of impaired days due to the disease within the previous month (from 0 to 30). Two items were evaluated by the dermatologist: intensity of

inflammation from 0 (no inflammation) to 10 and discharge intensity from 0 (no discharge) to 10. At 3 months, the dermatologist weighted the patient and asked patient opinion on brewer's yeast-exclusion diet, based on three criteria: efficacy (from 0 to 10), difficulty to follow the diet (hard, moderate, easy), and diet adherence (poor, moderate, good).

Pain, number of impaired days due to the disease within the previous month, intensity of inflammation and discharge intensity at inclusion and at three months were compared by using the Student test. A p value less than 0.05 indicated a statistically significant difference.

As the diet was only proposed to the patient who was free to observe it or not, the study did not require specific consent [14].

Results

Patient characteristics

Twenty patients were included between January and April 2013. Mean age was 31 years (18-56), with a sex ratio of 1/1. Mean weight was 87 kg (99 kg and 73 kg, for men and women, respectively), ranging from 52 to 140 kg. Mean waist circumference was 87 cm. fourteen patients were smokers (mean consumption of 6 cigarettes a day). During the study, none of them quitted smoking.

Associated diseases included hyperlipidaemia (2 patients) and Crohn's disease (2 patients). No patient had diabetes or psoriasis.

HS characteristics

Mean duration of the lesions was 10 years (1-28 years). Four patients had a family history of HS. HS was localized on the axillae in 16 patients (80%), inguinal regions in 19 patients (95%) and in other regions in 7 patients (35%) including face, retro-auricular area, neck, abdomen, forearm, and chest. Six patients (30%) had acne conglobata and 4 (20%) pilonidal cysts.

Associated treatments

Previous treatments included antibiotics (19 patients, 95%), zinc (11 patients, 55%), retinoids (7 patients, 35%) and TNF alpha inhibitors (3 patients, 15%). Twelve patients (60%) have had surgery.

At inclusion, 16 patients had a medical treatment (80%): antibiotics (10 patients), zinc (4 patients) and TNF alpha inhibitor (2 patients; patient 7 and 14)). At month 3 evaluation, 14 patients had a medical treatment: antibiotics (10 patients), zinc (6 patients), and TNF alpha inhibitor (2 patients). Zinc supplementation was added in two patients (patients 5 and 17) in addition to the diet.

Evolution of the lesion severity score (Table 2)

Compared to inclusion, pain ($p=0.006$), number of impaired days due to the disease within the previous month ($p=0.007$), intensity of inflammation ($p=0.018$) and discharge intensity ($p=0.005$) were significantly lower after the three months diet. Mean self-pain evaluation by patients was 4.3 and 1.8, at inclusion and after 3 months, respectively (Figure 1).

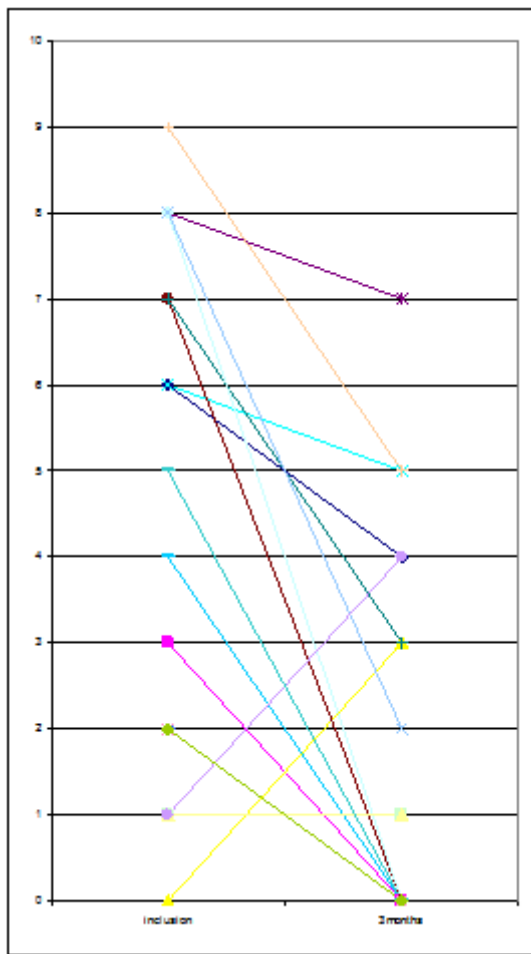


Figure 1: Individual evaluation of pain intensity.

Mean number of impaired days due to the disease within the previous month was 13.4 and 5, at inclusion and 3-month, respectively (Figure 2).

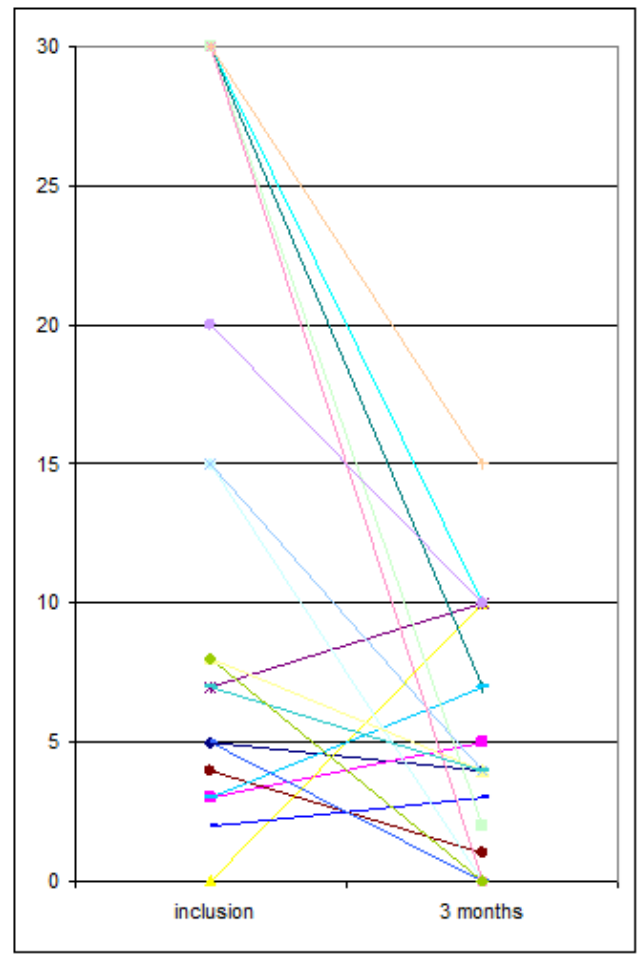
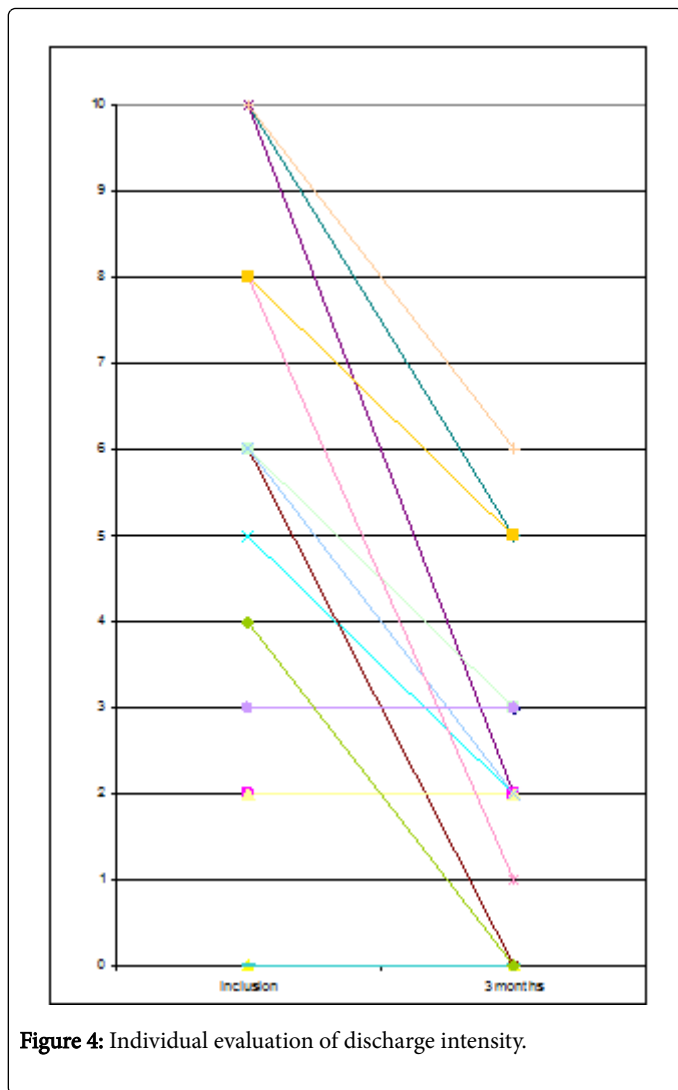
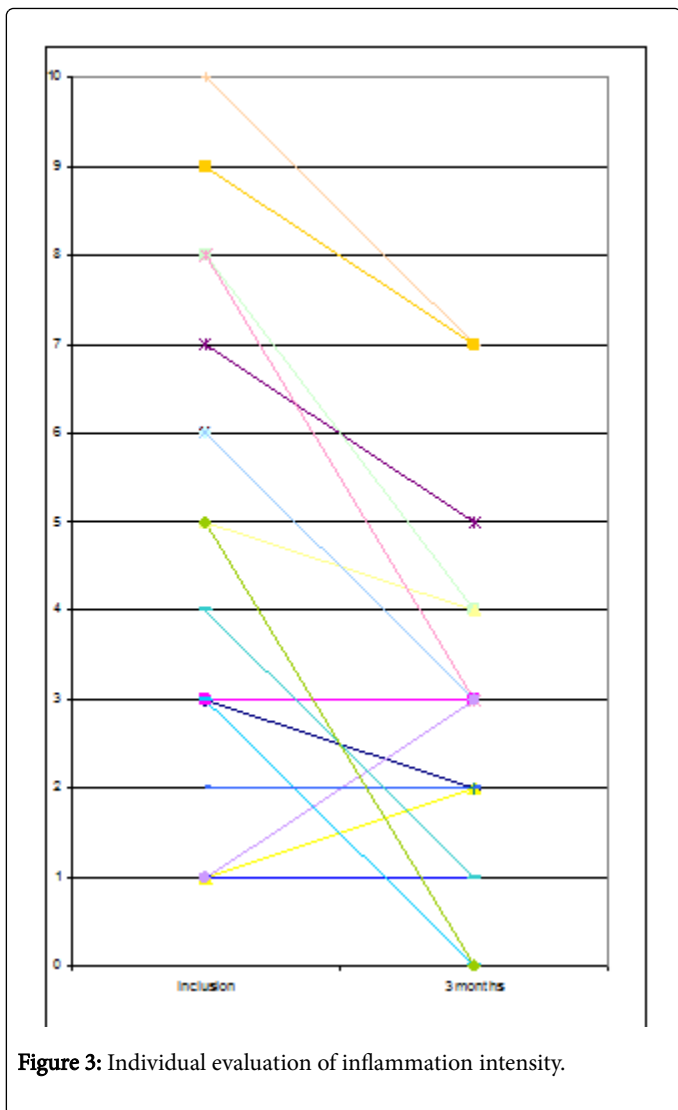


Figure 2: Individual evaluation of the number of impaired days due to the disease within the previous month.

Mean global evaluation of inflammation severity by dermatologists, was 4.9 and 2.9, at inclusion and after 3 months, respectively (Figure 3).

	Mean score	Inclusion	3-month
Patient	Number of impaired days due to the disease within the previous month (0 to 30)	13.4/30	5/30
	Pain (0 to 10)	4.3/10	1.8/10
Dermatologist	Inflammation (0 to 10)	4.9/10	2.9/10
	Discharge intensity (0 to 10)	4.7/10	1.9/10

Table 2: Lesion severity scores evolution at inclusion and at three months.



Mean global evaluation of discharge intensity by dermatologist was 4.7 and 1.9, at inclusion and after 3 months, respectively (Figure 4).

Diet effectiveness, feasibility and adherence (Table 3)

Five patients judged the diet useless, and 10 found it very useful with a mean score of 4.9 (Figure 5). Feasibility of the diet was scored hard, mild, and easy by 6, 9, and 5 patients, respectively. Diet adherence was scored bad, mild, and good by 4, 6, and 10 patients, respectively.

Weight evolution

Mean weight did not change much during the 3-month diet, with a mean weight variation of 0.5 kg per patient. No weight loss was observed in patients who judged the diet useless, with some patients even gaining weight, suggesting a bad adherence on the diet.

A mean weight loss of 1 kg per patient was observed in patients who judged the diet very useful.

Discussion

Hidradenitis suppurativa is a severe chronic disease with a high impact on quality of life. Conventional treatments remain unsatisfactory because they have a low efficacy.

Interest (0 to 10)	Mean score : 4.9/10
	5 patients : 0/10
	5 patients : 10/10
Diet feasibility	Hard : 6 patients
	Moderate : 9 patients
	Easy : 5 patients
Diet adherence	Poor : 4 patients
	Moderate : 6 patients
	Good : 10 patients

Table 3: Evaluation of the diet by the patients.

In the present study, we found that brewer's yeast-exclusion diet might be useful in the management of HS.

This is in line with a recent study by Cannistrà et al. which showed improvement of HS in 12 patients, who have undergone 12-month

brewer's yeast exclusion diet [9]. In addition, in the same study, yeast-free diet following surgery in a few patients was found to prevent relapse. However, in the latter study, diet utility, feasibility, and adherence as well as weight variation were not evaluated (Figure 6).

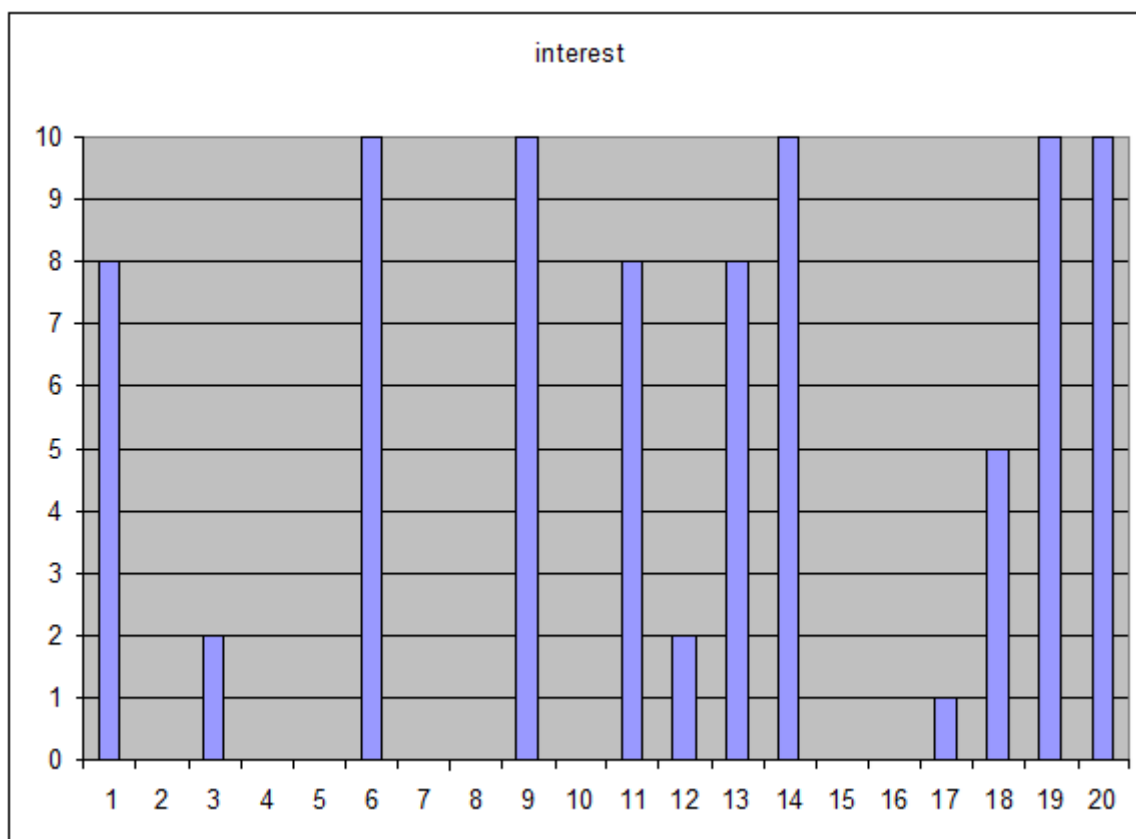


Figure 5: Influence of the diet as evaluated by the patient.

We intentionally wanted to evaluate the interest of brewer's yeast-exclusion diet in the management of hidradenitis suppurativa in a "real-life" setting. Thus, the diet was proposed for a three-month period alone or adding-up to the current treatment. Our study was designed to allow the evaluation of the feasibility and interest of brewer's yeast-exclusion diet by both the dermatologist and the patient. We decided to use simple clinical criteria to evaluate the disease activity, instead of Sartorius criteria. While Sartorius score only includes the dermatologist evaluation, we chose to take into account the patient assessment. These criteria are routinely used in the current practice of Dr G. Gabison, a French dermatologist specialised in hidradenitis suppurativa.

Brewer's yeast is commonly found in several processed food, and its exclusion is a major change in most of the patient's diet. However, 10 out of the 20 patients of our study judged their adherence to the diet good, 6 mild and 4 bad.

Improvement was not present in all patients, and appears to be linked to diet adherence. Median variations in both patient evaluation

of pain and number of days within the previous month of impaired days due to the disease were more important in patients with a good adherence to the diet (-5 for pain, -10 for the number of impaired days), than in patients with a bad or mild adherence (-2 for the pain, -4 for the number of impaired days). Median variations in dermatologist evaluation of inflammation severity and discharge intensity were also more important in patients with a good adherence to the diet (-3 for the inflammation, -4 for the discharge), than in patients with a bad or mild adherence (-1 for the inflammation, no variation for the discharge).

The diet excludes mainly bakery products, so we first thought that patient with a good adherence to the diet would lose weight. As obesity is a well-known risk factor for the disease, 3 weight losses can possibly be a confusion bias in patients observing the diet. Interestingly, mean weight variation was small (0.5 kg per patient), and median weight variation was 0 in both situations (good and bad or mild adherence to the diet). This suggests that efficacy of the diet is more linked to the brewer's yeast exclusion itself than to the weight loss.

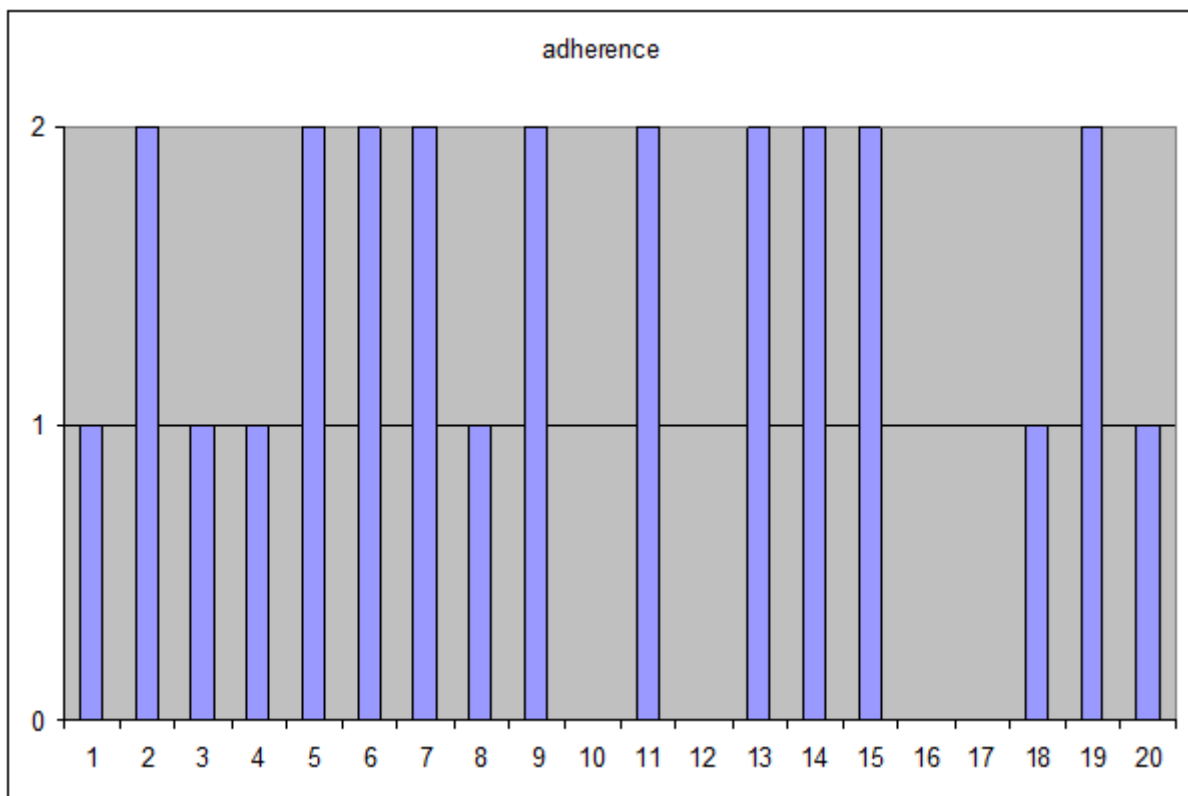


Figure 6: Individual adherence to the diet (0 poor, 1 moderate, 2 good).

Reactions to food seen in alimentary intolerance are induced by antibodies of the IgA class. Alteration of the intestinal mucosal, triggered by environmental factors and microbiota, may lead to Ig-mediated immune reactions against bacterial and dietary antigens. The antigen-antibody complex can be deposited in tissue and be responsible of various clinical manifestations, including gastrointestinal, rheumatologic and cutaneous symptoms. In celiac disease antibodies are directed against gluten, gliadin, and transglutaminase. Interestingly transglutaminase is also present in the skin and may explain the development of dermatitis herpetiformis. Similarly, brewer's yeast consumption may lead to flare in HS through expression of ASCA and accumulation of antigen immune complex in the skin. Diet can stop this immune reaction, as seen in series showing disappearance of ASCA following a gluten-free diet in celiac disease [15]. In Cannistra's study, all 12 patients were ASCA positive. In order to better understand the link between brewer's yeast intolerance and ASCA, it would be interesting to correlate the course of ASCA status and the adherence and efficacy of the diet.

Interestingly, ten patients were treated with antibiotic during the study. Antibiotics may influence the digestive microbial flora of these patients, and make them more susceptible to the yeast.

HS is associated with numerous comorbidities, including metabolic syndrome, depression, inflammatory bowel disease, SAPHO syndrome, and spondyloarthritis [16]. Various studies and case reports suggested an association between Crohn's disease and HS. In a recent large study of Van der Zee, 1093 patients with inflammatory

bowel disease were asked for signs of HS [11]. One hundred eighty one patients with Crohn's disease reported having HS (26%).

Association between HS and Crohn's disease, together with the fact that both diseases seem to flare with brewer's yeast consumption, goes along with the theory of immune reactions against dietary antigens.

Conclusion

We herein propose brewer's yeast free diet as a non-invasive treatment for the management of hidradenitis suppurativa. This diet appears feasible. It seems effective when well observed, and its effect does not seem to be linked to weight loss. A larger and long-term study with systematic assessment of the course of ASCA levels and response to the diet is now necessary to confirm our results. Brewer's yeast free diet could be considered as an adjunctive treatment to control or reduce the number of flare of the disease.

References

1. Buimer MG, Wobbes T, Klinkenbijn JHG (2009) Hidradenitis suppurativa. *Br J Surg* 96: 350-360.
2. Jemec GBE (2012) Clinical practice. Hidradenitis suppurativa. *N Engl J Med* 366: 158-164.
3. Revuz JE, Canoui-Poitrine F, Wolkenstein P, Viallette C, Gabison G, et al. (2008) Prevalence and factors associated with hidradenitis suppurativa: results from two case-control studies. *J Am Acad Dermatol* 59: 596-601.
4. Fitzsimmons JS, Guilbert PR (1985) A family study of hidradenitis suppurativa. *J Med Genet* 22: 367-73.

5. Wang B, Yang W, Wen W, Sun J, Su B, et al. (2010) Gamma-secretase gene mutations in familial acne inversa. *Science* 330: 1065.
6. Melnik BC, Plewig G (2013) Impaired Notch signalling: the unifying mechanism explaining the pathogenesis of hidradenitis suppurativa (acne inversa). *Br J Dermatol* 168: 876-878.
7. Rambhatla PV, Lim HW, Hamzavi I (2012) A systematic review of treatments for hidradenitis suppurativa. *Arch Dermatol* 148: 439-446.
8. Thomas CL, Gordon KD, Mortimer PS (2014) Rapid resolution of hidradenitis suppurativa after bariatric surgical intervention. *Clin Exp Dermatol* 39: 315-317.
9. Cannistrà C, Finocchi V, Trivisonno A, Tambasco D (2013) New perspectives in the treatment of hidradenitis suppurativa: surgery and brewer's yeast-exclusion diet. *Surgery* 154: 1126-1130.
10. Van der Zee HH, van der Woude CJ, Florencia EF, Prens EP (2010) Hidradenitis suppurativa and inflammatory bowel disease: are they associated? Results of a pilot study. *Br J Dermatol* 162: 195-197.
11. Van der Zee HH, de Winter K, van der Woude CJ, Prens EP (2014) The prevalence of hidradenitis suppurativa in 1093 patients with inflammatory bowel disease. *Br J Dermatol* 171: 673-675.
12. Amre DK, Lu SE, Costea F, Seidman EG (2006) Utility of serological markers in predicting the early occurrence of complications and surgery in pediatric Crohn's disease patients *Am J Gastroenterol* 101: 645-652.
13. Barclay GR, McKenzie H, Pennington J, Parratt D, Pennington CR (1992) The effect of dietary yeast on the activity of stable chronic Crohn's disease. *Scand J Gastroenterol* 27: 196-200.
14. Cannistra C, Finocchi V, Trivisonno A, Tambasco D (2013) New perspectives in the treatment of hidradenitis suppurativa (surgery and brewer's yeast-exclusion diet): Some clarifications. *Surgery* 154: 1126-1130.
15. Mallant-Hent RC, Mary B, von Blomberg E, Yüksel Z, Wahab PJ, et al. (2006) Disappearance of anti-*Saccharomyces cerevisiae* antibodies in coeliac disease during a gluten-free diet. *Eur J Gastroenterol Hepatol* 18: 75-78.
16. Crowley JJ, Mekkes JR, Zouboulis CC, Scheinfeld N, Kimball A, et al. (2014) Association of Hidradenitis Suppurativa Disease Severity with Increased Risk for Systemic Comorbidities. *Br J Dermatol* 171: 1561-1565.