



**International Journal of Biology, Pharmacy
and Allied Sciences (IJBPAS)**
'A Bridge Between Laboratory and Reader'

www.ijbpas.com

**SJOGREN'S SYNDROME – GUTFLORA DIET AND PSYCHOTHERAPY BASED
APPROACH: A CASE STUDY**

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Received 22nd July 2021; Revised 25th Aug. 2021; Accepted 30th Sept. 2021; Available online 1st Nov. 2021

<https://doi.org/10.31032/IJBPAS/2021/10.11.1074>

ABSTRACT

Sjogren's syndrome (SS) is an autoimmune disorder that interferes and affects the function of exocrine glands, especially the salivary and lacrimal glands. Sjogren's syndrome can cause a wide range of symptoms and the treatment is usually symptomatic. This present study reports a 32 years old female patient who is suffering from Sjogren's syndrome for over 16 years. She had ocular symptoms and psychological issues like low mood, stress, suicidal thoughts at the time of presentation. She has been referred to us by her ophthalmologist for diet and counselling. The combination of gut flora diet and psychotherapy involving CBT and NLP helped to improve her symptoms like fatigue, myalgia, ocular complaints and improved her mental well-being. This case suggests that besides medications, diet modification and psychotherapies should also be considered in autoimmune disorders as they are linked to immune function.

Keywords: Gutflora Diet, Sjogren's syndrome, Zenlp Technique

INTRODUCTION:

Sjogren's Syndrome (SS) is a chronic autoimmune disorder marked by the lymphocytic infiltration of exocrine glands, mainly the salivary and lacrimal glands [1]. It results in a functional impairment that usually presents as keratoconjunctivitis

sicca and xerostomia (i.e., chronic dryness of eyes and mouth) with various extra-glandular manifestations including renal, ortho, neuro, gastric, vascular, rheumatological, and pulmonary symptoms [2]. Even though Sjogren's syndrome is

most commonly found in middle-aged and geriatric women, young ones and teenagers may also be affected in rare cases [3]. The two forms of Sjogren's syndrome are Primary Sjogren's syndrome and Secondary Sjogren's syndrome [1]. Although the specific cause of Sjogren's syndrome is unknown, hereditary, environmental and immunological factors, are thought to trigger the condition [2]. Patients with Sjogren's syndrome may see several healthcare practitioners, including family physicians, Ear, Nose and Throat (ENT) specialists, ophthalmologists and dentists, because of the diverse spectrum of clinical symptoms [4]. Ocular and oral symptoms are managed with symptomatic treatment and the extra-glandular manifestations are treated based on the knowledge of treating similar manifestations of Systemic Lupus Erythematosus (SLE) [5]. Because of the severity of xerostomia in Sjogren's syndrome, individuals may avoid foods that exacerbate their oral complaints, resulting in nutritional deficits [6]. Gut dysbiosis has also been linked to ocular mucosal disorders in Sjogren's syndrome [7]. Functional foods mainly prebiotics and probiotics play a significant role in modulating the immune system [8]. This case suggests that diet modification along with psychotherapy compliments the

medications in treating Sjogren's syndrome, as they are linked to immune modulation. Neuropsychiatry manifestations like depression and anxiety are commonly seen in Sjogren's syndrome patients [9]. Neuro-Linguistic Programming (NLP) is a technique shown to improve mental health, self-efficacy, self-management and reduce anxiety [10]. Furthermore, this psychotherapy technique was found to be effective in treating anxiety, depression etc. [11]. Studies have shown that psychotherapies like CBT helps in improving immune system function [12]. The present case study reports a female Sjogren's syndrome patient who got improved with dietary modification and Psychotherapy counselling.

Case presentation:

This was a case of 32 years old female patient who has Sjogren's syndrome and was referred to our health centre in July 2019 by her ophthalmologist for diet modification and psychological counselling. She presented with fatigue, myalgia, low mood and suicidal thoughts. She also had ocular symptoms of Sjogren's syndrome such as blurred vision, blepharitis, dry eyes which was taken care of by her ophthalmologist. Schirmer's test showed only 3 millimetres of moisture. She was prescribed Carboxymethylcellulose 0.5% W/V eyedrops, ofloxacin & dexamethasone eyedrops, and neomycin/

polymyxin B /Bacitracin ophthalmic ointment. The aim of our treatment was to improve her mental well-being and general well-being through diet and psychotherapy. Her past medical history includes 16 years of Sjogren's syndrome, for which she consulted many physicians and was on symptomatic treatment. Because of the complaints of Sjogren's syndrome, including ocular and oral symptoms, she faced difficulties in her social life. She was using eye drops every day for 16 years. She mentioned she felt anxious and irritated most of the time. There were no complaints of diabetes or hypertension at the time of presentation. She had a history of conjunctival grafting surgery in both eyes for symblepharon in 2008. The patient also had complaints of recurrent dacryocystitis and underwent two dacryocystorhinostomy surgeries (the first one was in the right eye, 2009 and the second was in the left eye, 2019). The histopathology reports of cyst showed eccrine hidrostoma. She also stated that she had PCOD. Her previous medical and medication history was not clear.

Her BMI was 34.8 (obese). Before modifying the patient's diet, blood tests were ordered. CBC was normal except for increased RBC count and decreased red cell distribution width(RDW)-SD. The test results for the liver function test, renal function test, Mineral screen, thyroid

profile, and pancreatic enzymes were within normal limits. A decrease in the absolute eosinophil count and absolute monocyte count was seen. Fasting blood glucose levels and ultra-sensitive insulin levels were increased, which revealed that the patient is prediabetic. Total cholesterol, LDL and non-HDL showed abnormal values (**Table 1**). Apolipoprotein B was increased. While vitamin B12 was normal, Vitamin D level was found to be very low. (*Abnormal blood values are given in Table 1*). Urine examination was normal. After considering the blood report, the Gut flora diet was suggested to the patient, which has two phases of the diet. Phase 1 was for the first 30 days where she was advised to take only raw vegan food (prebiotic diet). After that, Phase II of the diet (for 100 days) was started. In this phase, cooked vegetables, foods rich in protein, and good fats were all included. And gradually, white and red meats with sea foods and eggs were also added to her diet chart. The phase 1 is a probiotic diet where the patient took probiotic tablets, probiotic pickles, Kefir as per our advice. Along with the dietary modification, supplements like Vitamin D 60 k capsules (weekly once) and omega 3 capsules (once daily) were also prescribed to her. The parameters like weight, hunger rate, cravings, satiety, energy level, joyful moments, thoughts and emotions were all

monitored on daily basis. All of the parameters were kept track of by having the patient consciously observe and record her thoughts, feelings, and emotions. The Hunger rate was calculated by asking the patient to rate her hunger on a scale of 1-10, with 10 being starving and 1 being too full. Some simple relaxing exercises like stretches were advised to the patient and also monitored daily. The amount of water taken on an empty stomach and the types, quantity of foods eaten were also noted daily as reported by our patient.

The stress level was assessed by using a self-administered ISMAUK (International Stress Management Association) stress questionnaire [13] and the score was 19, indicating high stress. Cognitive Behavioural Therapy (CBT) and Neuro-linguistic programming (NLP) based counselling sessions were conducted every 2 weeks for 130 days. After completing the

two phases of the diet, blood test was repeated which showed an improvement in the parameters (see Table 01). Her BMI was reduced to 30.1. All the symptoms were improved and also the need for applying eye medications is reduced. After eye examination, her ophthalmologist reported that 80% of her symptoms were improved because of these dietary modifications and psychotherapy. Schirmer's test revealed 15 millimetres of moisture in both eyes. Improvement was also noted in Slit lamp examination. The recurrence of dacryocystitis was controlled. After the diet, she was advised to avoid sugar and junk foods. The ISMAUK stress questionnaire score after counselling was 9 which indicates improvement in the stress levels when compared to first test. (Score-19). The patient reported an alleviation of symptoms related to stress, low mood and suicidal thoughts.

Table 1: Blood report

Parameters	Normal value	Before diet and psychotherapy*	After diet and psychotherapy*
Complete blood count			
Total RBC count	3.8-4.8 million/microL	5.36	4.76
HB	12-15 gm	13	12.2
PCV	36-46 %	42.7	38.7
MCV	83-101 fl	79.6	81.2
MCH	27-32 pg	24.3	25.6
MCHC	31.5-34.5 g/dl	30.4	31.5
Red cell distribution width SD	39-46 fl	33.5	52.8
Red cell distribution width CV	11.5-15 %	12.1	12
Total WBC count	4000-10000 cell/cumm	8800	8900
Differential count			
Neutrophil	40-75%	75.1	39.3
Lymphocytes	20-140%	23.3	46.6
Eosinophils	1-6%	0.4	7.3
Monocytes	1-10%	1.1	6.8
Basophils	<2%	0.1	0
Absolute neutrophil	2000-7000 cells/micro L	6608.8	3497.7

count			
Absolute lymphocyte count	1000-4000 cells/micro L	2050.4	4147.4
Absolute eosinophil count	40-440 cells/micro L	35.2	649.7
Absolute monocyte count	200-1000 cells/micro L	96.8	605.2
Absolute basophil count	<150 cells/micro L	8.8	0
Platelet count	150-450 thousand/mu L	412	348
Plateletcrit	19.7-42.4%	27.5	28
Mean platelet volume	6.5-12 fL	9.1	8.8
Platelet to large cell ratio (PLCR)	19.7-42.4%	40	41
Blood glucose			
Fasting glucose	70-100 mg/dl	113.03	78.6
HbA1c	<5.6 %	5.5	4.5
Ultra sensitive insulin	< 6 mU/L	12.9	4.8
Lipid profile			
Total cholesterol	<200 mg/dl	314.3	284.3
LDL cholesterol- direct	<130 mg/dl	206.7	205.1
HDL cholesterol- direct	More than 55	71.6	51.8
Non HDL cholesterol	<140	242.7	232.5
Triglycerides	<150 mg/dl	75.6	140.2
VLDL	<35	15.12	28.04
LDL/HDL ratio	<3	2.89	3.96
Cholesterol/HDL ratio	3.9-5	4.39	5.49
Tgl/Hdl Ratio	<2	1.06	2.71
Cardiac markers			
Apolipoprotein A1	107-205 mg/dl	186.74	113.3
Apolipoprotein B	52-129 mg/dl	142.36	123.02
Apo B/Apo A1 ratio	0.30-0.9 ratio	0.76	1.09
Vitamin B12 and D			
Vitamin B12	211-946 pg/ml	466	855
Vitamin D Total- 25 Hydroxy calciferol	30-100 ng/ml	16.33	109
*Units are same as given in their normal values			

Table 2: Two Phases of diet

Diet Phase	No. of days	Diet
Phase 1	30 days	Raw vegan diet (Prebiotic diet)
Phase 2	100 days	Probiotic diet (includes probiotic tablets, kefir, probiotic pickles, protein rich foods, good fats, cooked vegetables. white and red meats with sea foods and eggs were added to the diet chart from 31 st day) along with Vit D 60k IU supplements – weekly once and Omega 3 supplements once daily (OD)

DISCUSSION:

We present a case of a 32-year-old married female patient who is suffering from the autoimmune disorder, Sjogren’s syndrome for the past 16 years. Even though Sjogren’s syndrome affects about 2% of the adult population, over half of those affected go undiagnosed [14]. This common autoimmune illness can only be

managed by symptomatic treatment [15]. The patient mentioned that even after consulting many physicians, improvement was not seen. With dietary modifications and psychotherapy, her symptoms well improved, which was evident in the Schirmer’s test, slit lamp examination, blood reports, and stress questionnaire. This case demonstrates the importance and

impact of diet in controlling and managing autoimmune disorders, particularly Sjogren's syndrome. The immune system's function is influenced by an individual's nutrition status and food intake habits [16]. Dietary changes have the potential to enhance clinical outcomes in a variety of autoimmune illnesses [17].

This patient was referred to us by her ophthalmologist and she came with many ocular symptoms from which she had been suffering for over 16 years. After taking blood tests, Gut flora diet was given to the patient, which has a prebiotic diet phase and probiotic diet phase. A prebiotic and probiotic diet was given to maintain the healthy gut microbiota. While the dietary changes and psychotherapy were given to manage her weight and mental health, the ocular symptoms were also improved. This case also proved the link between gut dysbiosis and dry eye.

The onset of the illness is linked to plasmacytoid dendritic cells (pDCs) [18]. Microorganisms infect the exocrine glands, causing pDCs to produce more type I interferons and glandular epithelial cells to die, presenting self-antigens to autoantibodies and triggering autoimmunity [18]. The pathogenesis of Sjogren's syndrome-related dry eye involves both T and B cells [19, 20]. Pro-inflammatory cytokines such as IL-1b, IL-6, INF- γ , and

TNF- α are produced by primed TH1 cells, while IL-17 is produced by TH17 cells. TH17 cells enhance autoreactive B cell responses and contribute to persistent inflammation [21]. Lacrimal gland destruction is sped up by CD8+ T lymphocytes as well [20h]. As pathological antigen-presenting cells (APCs) and generators of autoantibodies against Ro/SSA, La/SSB, and the muscarinic 3 receptors, autoreactive B cells are important hallmarks of Sjogren's syndrome-related dry eyes [19, 20]. Because the gut microbiota has a significant impact on B-cell repertoire diversification, antibody production, and plasmacytoid dendritic cells via TLR7 signalling, gut dysbiosis is likely to be linked to the pathophysiology of dry eyes in Sjogren's syndrome [21]. Prebiotics and probiotics are effective treatment strategies to rebiosis of the gut [22].

The blood report showed that the patient's vitamin D level was very much low, and she was in the prediabetic stage. Care was given, on taking this into account. Previous literature states that low vitamin D level is also linked with autoimmune disorders [23]. Dietary supplements like Vitamin D 60K IU capsules (weekly once) and omega-3 capsules (once daily) were prescribed.

As the patient had low mood and stress secondary to the illness, dietary changes that helped in managing the symptoms could also have eased the psychological issues. CBT and NLP techniques were used to improve her mental well-being. At the end of counselling sessions and diet, her mental health was very much improved as revealed by ISMAUK stress questionnaire [13]. After 130 days of the diet, her BMI was found to be reduced. According to her ophthalmologist, the ocular symptoms that were presented were also improved. This dietary modification also prevented the recurrence of dacryocystitis. The need for frequent use of eye drops was reduced. The patient described that her difficulties in social life and disease-related stress were relieved.

All these show the importance of modification of diet and psychotherapy in Sjogren's syndrome. As there are more evidence present in literature for the role of nutrition in autoimmune disease, more focus should be given to the individual nutrient status and diet modification.

CONCLUSION:

Sjogren's syndrome has a broader spectrum of symptoms and it is known that there are no curative agents available and only symptomatic management can be provided. Scientific evidence proves that

diet remains a modifiable factor for autoimmune diseases. Significant improvement was seen with diet modification in our patient. We recommend that apart from the medications, dietary changes should also be considered for managing autoimmune disorders like Sjogren's syndrome. Psychotherapy with CBT and NLP were also found to play an important role in the mental well-being of our patient.

Funding:

No funding available

Acknowledgement:

The authors are indebted to Mr. Jayasekaran, Founder – ZENLP Academy for guidance of ZENLP counselling.

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