



JOURNAL OF THE ACADEMIC SOCIETY FOR QUALITY OF LIFE (JAS4QOL)

2022 VOL. 7(1) 2:1-5

CHURG-STRAUSS SYNDROME OR EOSINOPHILIC GRANULOMATOSIS WITH POLYANGIITIS (EGPA): A CASE STUDY OF USING STEROID COMBINED WITH FUNCTIONAL FOOD FOR TREATMENT

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Citation: NAKYAMA, T.; FOONG, A.. Churg-Strauss Syndrome or Eosinophilic Granulomatosis with Polyangiitis (EGPA): A Case Study of Using Steroid Combined with Functional Food for Treatment *JAS4QoL* 2022, 7(1) 2:1-5.

Online: <https://as4qol.org/uDcpC>

Received Date: 2022/12/16 Accepted Date: 2022/12/17 Published: 2022/12/31

ANNOUNCEMENTS

- The 2019 International Conference on Quality of Life was held at Kyoto Pharmaceutical University from Sept 28-29, 2019. Further information can be found at <http://as4qol.org/icqol/2019/>
- We have moved to continuous publication. Beginning January 2019 the editing committee has decided to adopt a continuous publishing model for Journal publication. Individual articles will be released online as they become ready, allowing a steady stream of informative quality articles. We will also be moving to a calendar year issue cycle. In traditional terms, each volume will encompass a single year and consist of a single issue. Publishing on a just-in-time basis allows authors to present their results in a timely fashion, and our readers, students, and colleagues to access our content and cite articles more quickly and free from the restrictions of a predefined timetable. As a result of these changes, the look and style, as well as the function, of the Journal will be different, and hopefully improved.
- The 2019 International Meeting on Quality of Life was held recently. Proceedings as well as photos and other information can be found at <http://as4qol.org/icqol/>

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Case Report

Churg-Strauss Syndrome or Eosinophilic Granulomatosis with Polyangiitis (EGPA): A Case Study of Using Steroid Combined with Functional Food for Treatment

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Abstract

A female patient, who complained of weight loss, suffered from pain with occasional numbness and tingling sensations in joints/muscles of her upper/lower extremities, and her abdominal regions, and suffered from general weakness with fatigue on a daily basis. Clinic visits revealed that she had Churg-Strauss syndrome^{1*} or eosinophilic granulomatosis with polyangiitis (EGPA)^{*}. Early clinical data showed high C-reactive protein (CRP: **5.1**mg/dL) levels and eosinophil counts (**9.2%**), which improved to within normal ranges (CRP: <0.2 mg/dL; eosinophil counts: 3-5%) with 5-yr steroid treatment (prednisolone: 35 mg daily). However, EGPA-related signs and symptoms, AMY (amylase), and other blood and metabolic indexes registered unfavorable readings despite persistent steroid treatment. Her physical and biochemical conditions improved in a time-dependent fashion after combining steroid administration with complementary intake of functional food **3eMulti**, which contained natural ingredients (such as docosahexaenoic acid, pecan leaf, pandan leaf, mangosteen peel extracts, nattokinase, lycopene, and beehive propolis) with multivariant purposes such as potent antioxidation, favorable blood vascular and cell-function properties. After 9-months of daily intake of the aforementioned functional food in addition to continuous steroid treatment, she recovered completely from the physical and biochemical deficits. To date, she has been enjoying good quality of life (QoL), with above-mentioned combination treatment continuing without any adverse effects. When medications alone are insufficient to treat an idiopathological disease, a combination of medication and functional food intake (particularly with effect-complementary ingredients) may improve the

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Available online at <https://as4qol.org/uDcpC>

Received: 2022/12/16
Accepted: 2022/12/17
Published: 2022/12/31

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patient's condition so they may be able to accommodate or normalize the pathological condition. This may lead to a more wholesome, in terms of QoL, living conditions for patients suffering from intractable disease.

1. BACKGROUND

We encountered a 68-yr-old female patient with complaints of appetite loss accompanied by weight loss, as well as pain in the joints and muscles of her upper and lower extremities. She suffered from occasional numbness and tingling sensations in her four extremities. Bothered by this discomfort and pain, she could not rest well, and her body felt a general weakness with unexplained fatigue, even though she did not engage in any strenuous physical activity. She went to a physician, who clinically diagnosed her condition as showing signs of Churg-Strauss syndrome¹ or a condition also known as eosinophilic granulomatosis with polyangiitis (EGPA)* based on the following medical history of symptoms/signs and a blood test analysis.

2. SIGNS, SYMPTOMS & RELATED BLOOD ANALYSIS DATA

Early clinical data (~2012: data not shown) showed high C-reactive protein (CRP: **5.1**mg/dL) levels and eosinophil counts (**9.2%**), which improved to within normal ranges (CRP: <0.2 mg/dL; eosinophil counts: 3-5%) with 5-yr continuous use of steroids (prednisolone: 35 mg/daily). However, AMY (amylase), WBC (white blood cells), ESR-1hr (erythrocyte sedimentation rate after 1-hr interval), γ -GT (gamma-glutamyl transpeptidase or γ -GTP (gamma-guanosine 5'-triphosphatase), T-CHO (total cholesterol), HDL-C (high-density lipoprotein-cholesterol), LDL-C (low-density lipoprotein-cholesterol), TG (triglyceride), and serum sugar levels stubbornly fluctuated from September 2012 to December 2019 (**Table 1**: 2012/9 - 2019/12), despite persistent steroid treatment (note: dosing tapered down from 35 mg/day from 2017 to 3mg/day by 2020). Due to symptoms and signs, the patient often suffered from abdominal discomfort and pain, general weakness coupled with occasional numbness and tingling in the four extremities. All these discomforts and painful experiences, accompanied by poor appetite, resulted in weight loss with time-related fluctuating biochemical data despite steroid administration (**Table 1**: 2020/12/18). After reviewing the various functional properties and ingredients in the soft gel capsule in December 2020, the patient started taking functional food **3eMulti** as she had been suffering persistently for a long time with poor quality-of-life (QoL) despite continuing the steroid treatment.

After 3 months of functional food intake (\downarrow **2021/3/12**), the patient experienced some relief in March 2021: less pain in joints and muscles with lower incidence of numbness and tingling sensations of the four extremities. In fact, all biochemical data – except the AMY levels – subsequently improved and recovered to the standard normal ranges. EGPA-induced high γ -GT (or γ -GTP: gamma-glutamyl transpeptidase) levels were also reduced to normal range limits with intake of regulated dosages and a suitable regimen in a time-related manner. As for AMY, the stubbornly high levels were reduced to normal-range values by the end of 9 months of intake of **3eMulti** (**2021/09/30**). To date, the patient has continued to receive steroid treatment, and she is feeling comfortable with only rare occurrences of the previous symptoms in the four extremities and stomach. Furthermore, neither pain in the abdomen nor numbness or tingling sensations have been encountered in the four extremities. She seems to be enjoying meals with a good appetite, and

Characteristics symptoms & signs of Churg-Strauss syndrome or eosinophilic granulomatosis with polyangiitis (EGPA): an adult-onset disorder marked by blood vessel inflammations, which can restrict bloodflow to tissues/organs and damaging them. Accompanying signs include asthma, nasal allergies, sinus problems, rashes, gastrointestinal bleeding, pain/numbness in hands n feet. May have life-threatening complications (peripheral nerve damage, heart disease, kidney damage). May be caused by overactive immune system response; autoimmune response inducing widespread inflammation. **Treatment: steroids and other immunosuppressants.*

slight weight gains have gradually been observed: thus she is enjoying a good QoL.

Clinical Examination Report: Note: date in yy/mm or yy/mm/dd

			<< Steroid only: 35 → 5 mg/day >>		<< steroid + 3eMulti>>		
Items	Units	Normal standard Range	2012/9 - 2019/12 (10-yr + with fluctuating data and ongoing treatment with ...	2020/12/18 ...prednisolone (steroid) only	↓ 2021 03/12 3 mo	2021 06/17 6 mo	2021 09/30 9 mo
WBC	Cells/μL	(2.7 – 8.5) x 1000 (age: 60 – 69)	H 12.2 ~ 6.93	6.11	5.09	H 12.71	6.06
ESR 1hr	mm	3 – 15	H 25 ~ 10	H 25	15	H 27	5
γ-GT	U/L	7 – 29	H 31 ~ 19	H 31	20	19	18
T-CHO	mg/dL (mmol/L)	140 - 220 (3.5 - 5.6)	H 266 ~ 194 (6.8 ~ 5.0)	H 269 (6.9)	N/A	N/A	N/A
HDL-C	mg/dL (mmol/L)	50 - 104 (1.3 - 2.6)	H 106 ~ 98 (2.7 ~ 2.5)	H 106 (2.7)	101 (2.6)	105 (2.7)	102 (2.6)
LDL-C	mg/dL (mmol/L)	62-140 (1.6 - 3.6)	H 148 ~ 86 (3.8 ~ 2.2)	H 144 (3.7)	127 (3.3)	100 (2.6)	107 (2.7)
TG	mg/dL (mmol/L)	40-150 (0.4 - 1.7)	109 ~ 74 (1.2 ~ 0.8)	102 (1.1)	87 (1.0)	76 (0.9)	74 (0.8)
Serum sugar	mg/dL (mmol/L)	78 – 110 (4.3 – 6.1)	L 66 ~ 94 (3.7 ~ 4.9)	L 66 (3.7)	83 (4.6)	89 (4.9)	79 (4.4)
AMY	U/L	45 – 140	H 229 ~ 132	H 180	H 165	H 146	132

Table 1: Items monitored at 3-month (mo) intervals included (with normal standard range indicated): WBC (white blood cell counts, ESR-1hr (erythrocyte sedimentation rate for 1 hr), γ-GT (or γ-GTP: gamma-glutamyl transpeptidase), T-CHO (total cholesterol), HDL-C (high-density lipoprotein-cholesterol), LDL-C (low-density lipoprotein), TG (triglycerides), serum sugar, AMY (amylase). From Sept 2012 – After having EGPA diagnosed, daily steroid treatment (35 mg/day) was initiated; clinical data fluctuated from Sept 2012 - Dec 2019, the highest and lowest levels are indicated with steroid treatment, and daily steroid dosing was tapered down to 5 mg/day eventually as data showed improvements. **3eMulti** – a functional food formulated by Imex Japan Co Ltd – contains docosahexaenoic acid (DHA), tocotrienols (3e), pecah beling leaf (PBL), pandan leaf (PL), and mangosteen peel (MP) extracts, lycopene, natto kinase, and propolis.

3. DISCUSSION

The present case-study suffered from an intractable disease EGPA, where certain symptoms and signs were only partially relieved with a high dosage of steroid (35 mg/day) during the initial treatment period (CRP levels were much suppressed with steroid use). However, she continued to live with poor QoL induced by the disease, and with steroid-induced side effects shown in metabolic readings (LDL-C, TG and serum sugar levels) and EGPA-induced data (WBC and ESR-1hr). Her physical conditions (symptoms and signs) and biochemical data were improved with complementary use of a functional food along with her steroid treatment. The use of a tapered steroid dosage (5 mg/day) and improved QoL (improved symptoms and signs) accompanied by recovered biochemical data were only established with a time-related post-intake of a functional food **3eMulti**: a total of 9 months of supplementary intake was needed for all the biochemical levels to recover, although most signs and symptoms were almost fully normalized after 6-month intake. The initial improvements as shown by the time-related decreasing levels in cholesterol-related indexes (TG, LDL-C) were probably due to tocotrienols (3e) (Pearce et al.).² The therapeutic achievement was probably realized with not only from 3e, but also the use of other potent antioxidants such as pecah beling leaf (PBL), pandan leaf (PL), mangosteen peel (MP) extracts, lycopene,³ and propolis⁴ formulated in aforementioned functional food capsule. Apart from exhibiting antioxidant activity 60-fold more potent than that of tocopherol,^{5,6} the plant-based vitamin E (3e), natto kinase⁷ and docosahexaenoic acid (DHA)⁸ have demonstrated cleansing of debris and deposits on inner vascular walls, and bloodflow-promoting effects probably assisted by the anti-inflammatory,⁹ neuroprotective¹⁰ and other effects^{5,6,9,10} of the ingredients – both in endogenous macro- and micro-circulation environments – to realize an important function that relieves the major factor in contributing to the diseased state of EGPA (see above: definition of EGPA*). The increased γ-GT (or γ-GTP) level is an indication of liver damage or injuries to the bile ducts¹¹ (vs normal pre-diseased values of patient; data not shown). This could be due to

the summated anti-inflammatory effects of 3e,^{7,8,12} PBL,¹³ PL,¹⁴ and MP¹⁵ extracts, which also are all powerful antioxidants. The serum sugar levels decreased by EGPA – low by standard levels with steroid per se – were recovered after 3-month and subsequent steroid-complementary 3eMulti intake (Table 1), implying probable modulatory roles of PBL¹³ and MP¹⁵ extracts on sugar metabolism. Amylase, an enzyme made by pancreas and salivary glands and which catalyzes carbohydrate hydrolysis, i.e. the splitting of starch into smaller carbohydrate molecules such as maltose (a molecule composed of two glucose molecules), was at abnormally high levels: Excessive AMY may indicate pancreatic disorder.¹⁶ This concern was nullified after 9-month 3e intake combined with steroid treatment.

Furthermore, the anti-inflammatory properties of food ingredients such as PBL,¹³ PL,¹⁴ and MP¹⁵ extracts, lycopene,³ and propolis⁴ could have provided additional useful effects to improve bloodflow to and cell viability of tissues/organs per se. PBL,¹³ PL,¹⁴ and MP¹⁵ extracts which modulate the immunodefense system, may have also played a part in buffering the EGPA-induced overactive immunosystem to accommodate the autoimmune response to eventually suppress widespread inflammation in the whole body system. Refer to Mini Review in this issue of Volume 8.¹⁷ To date the patient has been enjoying a good quality of life with above-mentioned combination of functional food intake and steroid administration without any adverse effects.

4. CONCLUSION

In adequately treating a disease state, over and above medications alone, an alternative involving the combination of medication with functional foods (particularly with effect-complementary ingredients) may improve health and accommodate/normalize the condition, leading to a wholesome - in terms of QoL - living system for patients suffering from intractable disease. When chemical compounds (medications) proved inadequate in treating an idiopathic or intractable disease, use of functional food ingredients or compounds from natural sources may be resorted to or used as an alternative aid for useful complementary treatment.

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