

Impact of Omega-7 Supplementation on Ocular Inflammation in Severe Autoimmune Dry Eye: Case Report

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SEA BUCKTHORN OIL (OMEGA-7 PALMITOLEIC ACID): A NOVEL NUTRITIONAL APPROACH TO AUTOIMMUNE DRY EYE DISEASE

BACKGROUND

Dry eye disease (DED) in Sjögren's syndrome is characterised by:

- Aqueous deficiency
- Chronic ocular surface inflammation
- Tear film instability
- Meibomian gland dysfunction (MGD)¹

Management typically involves pharmacological therapies and in-office procedures such as intense pulsed light (IPL). However, nutritional interventions are gaining interest as adjunctive strategies.

WHY OMEGA-7 & SEA BUCKTHORN?

Sea buckthorn (*Hippophae rhamnoides*) is nature's richest sources of omega-7 fatty acids, specifically palmitoleic acid. Omega-7 (palmitoleic acid) is a monounsaturated fatty acid with specific roles in:

Epithelial integrity: supports epithelial barrier integrity and mucosal surface function²

Modulates inflammation: Modulates pro-inflammatory pathways (e.g. NF-κB)³

Ocular Surface Hydration: Attenuates tear osmolarity and pre-clinical evidence showing restoration of tear secretion⁴

Omega-7 (% palmitoleic acid) can be measured within full fatty acid profiles (e.g. omega index panels), providing additional insight into bioavailability and overall lipid analysis.

PURPOSE

To evaluate the impact of oral omega-7 (sea buckthorn oil) supplementation on ocular surface inflammation, tear film parameters, and epithelial integrity in a patient with Sjögren's-associated DED receiving standard of care, without IPL or procedural interventions.



ABBREVIATIONS

IPL: Intense Pulsed Light; SOC: Standard of Care; MMP-9: Matrix Metalloproteinase-9; LG: Lissamine Green; SPK: Superficial Punctate Keratitis; NF-κB: Nuclear Factor Kappa B; IL-1β: Interleukin-1 Beta; TNF-α: Tumour Necrosis Factor Alpha

METHODS: PATIENT PROFILE

37-year-old female with complex autoimmune history:

- Sjögren's syndrome
- Rheumatoid arthritis
- Hashimoto's thyroiditis
- Bipolar disorder & other comorbidities

Ocular Findings:

- Meibomian gland dysfunction (MGD)
- Ocular rosacea
- Demodex blepharitis
- Bilateral punctate keratitis
- Lagophthalmos

Concurrent Standard of Care (SOC):

- Lotilaner 0.25% BD (6-week course)
- Cyclosporine 0.09% BD
- Artificial tears PRN
- Omega-3s
- Blinking exercises

INTERVENTION ADDED

- Sea buckthorn oil 2000 mg (Eyetamins Eye Comfort) daily
- Source: omega-7 palmitoleic acid (primary active)
- Duration: 4 months continuous supplementation
- Concomitant standard of care maintained throughout
- No IPL or in-office procedures during observation period

RESULTS AT 4-MONTH FOLLOW-UP

Consistent improvements across objective markers of ocular surface health, without IPL or other in-office procedures:

MMP-9 STATUS
POSITIVE OU



NEGATIVE OU

Modulation of Inflammation

TEAR MENISCUS HEIGHT
0.17 OD/0.20 mm OS



0.38/0.41 mm

~2x increase in tear volume

CONJUNCTIVAL STAINING

Grade 1 LG OD / Trace OS



No staining OU

OMEGA-7 INDEX

0.86% palmitoleic acid



1.03% palmitoleic acid

+20% confirmed systemic uptake

Corneal staining (SPK): Grade 1 inf OU → Grade 1 inf OD / Trace OS. Notable epithelial recovery

DISCLOSURES

Dr. Mila Ioussifova has served as a consultant for Scope Eyecare and received honoraria for her work. ED, SB and CS are employees of Scope Eyecare.
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MECHANISM OF ACTION: OMEGA-7

Sea buckthorn oil is the world's richest plant source of omega-7 fatty acids, providing up to 35% palmitoleic acid alongside omega-3, -6, and -9 fatty acids, carotenoids, tocopherols, and phytosterols.

ANTI-INFLAMMATORY

Palmitoleic acid down regulates NF-κB signalling and inhibits pro-inflammatory cytokine production (IL-1β, TNF-α).^{2,3} In the context of autoimmune DED, this may directly attenuate MMP-9-mediated epithelial damage.

Pre-clinical data has highlighted the role of omega-7 in reducing inflammation in the lacrimal gland and subsequent tear restoration.³

EPITHELIAL SUPPORT

Sea buckthorn oil may support mucous membranes and epithelium by providing barrier-building fatty acids and antioxidants that reduce inflammation, protect cells from oxidative damage, and accelerate epithelial repair and re-epithelialization across skin and mucosal tissues.⁵

BIOMARKER: THE OMEGA-7 INDEX

The omega-7 index (palmitoleic acid % of total RBC fatty acids) provides a validated, quantifiable measure of systemic omega-7 status. The 20% increase observed in this case (0.86% → 1.03%) confirms therapeutic incorporation and correlates with clinical improvements.

CONCLUSION

In this patient with multifaceted Sjögren's-related DED, sea buckthorn oil supplementation (omega-7), alongside SOC, was temporally associated with:

- ✓ **Resolution of MMP-9-positive status**
- ✓ **~2-fold improvement in tear meniscus height bilaterally**
- ✓ **Resolution of conjunctival staining**
- ✓ **Significant epithelial recovery (SPK reduction)**
- ✓ **+20% increase in omega-7 index confirming systemic uptake**

These improvements occurred within a multimodal treatment approach and in the absence of IPL or procedural interventions. Notably, these improvements were observed despite previously initiated and ongoing omega-3 supplementation, suggesting an additional benefit following introduction of omega-7.

These observations highlight the potential adjunctive value of omega-7 nutritional therapy in autoimmune DED and support the need for controlled clinical trials.

There were no adverse events or tolerability issues reported.

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