Omega-7 Supplementation with Sea Buckthorn Oil in Sjögren's Syndrome Dry Eye: Case Report

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SEA BUCKTHORN OIL (OMEGA-7 PALMITOLEIC ACID): A NOVEL NUTRITIONAL APPROACH WITH EVIDENCE OF SYSTEMIC UPTAKE IN SJÖGREN'S SYNDROME DRY EYE

BACKGROUND

Sjögren syndrome keratoconjunctivitis sicca is a therapeutic challenge characterized by:
- Aqueous deficiency
- Chronic ocular surface inflammation
- Tear film instability
- Meibomian gland dysfunction (MGD)[1]

refractory to standard immunomodulatory therapies.

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 one of 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 function[2]

Inflammatory Modulation: modulates pro-inflammatory pathways (e.g. NF-κB)[3]

Ocular Surface Hydration: Attenuates tear osmolarity and pre-clinical evidence showing restoration of tear secretion[4]

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 bioavailability of oral omega-7 (sea buckthorn oil) supplementation and in parallel assess dry eye parameters (ocular surface inflammation, tear osmolarity, and symptom severity) in a patient with Sjögren's-associated DED receiving standard of care.

ABBREVIATIONS

IPL: Intense Pulsed Light; SOC: Standard of Care; MMP-9: Matrix Metalloproteinase-9; SPEED: Standard Patient Evaluation of Eye Dryness; NF-κB: Nuclear Factor Kappa B; IL-1β: Interleukin-1 Beta; TNF-α: Tumour Necrosis Factor Alpha.

METHODS: PATIENT PROFILE

68-year-old female with complex autoimmune history:
- Sjögren's syndrome with keratoconjunctivitis
- Hashimoto thyroiditis
- Hypertension
- Arthritis

Ocular Findings:
- Sjogren's syndrome with keratoconjunctivitis
- Meibomian Gland Dysfunction
- Ocular Rosacea
- Squamous blepharitis

Concurrent Standard of Care (SOC):
- Fish oil 1 g/day • Flaxseed oil 2 g/day
- Cyclosporine 0.05% BD • Autologous serum tears (50%)
- Cevimeline 30 mg TID

INTERVENTION ADDED

- Sea buckthorn oil 2000 mg (Eyetamins Eye Comfort) daily
  Source of omega-7 palmitoleic acid (primary active)
- Duration: 4 months continuous supplementation
- IPL therapy (4 sessions)
- Escalation of cyclosporine: 0.05% → 0.09%
- Blepharitis management
- Continuation of serum drops
- Blinking exercises and screen breaks

RESULTS AT 4-MONTH FOLLOW-UP

Consistent improvements across objective markers of ocular surface health were observed alongside a multimodal treatment approach and a marked increase in palmitoleic acid levels suggests systemic uptake, consistent with omega-7 bioavailability.

MMP-9 STATUS
TRACE POSITIVE OS
▼
NEGATIVE OU
Modulation of inflammation

SPEED SCORE
16
▼
12
Decrease in symptom severity

Tear Osmolarity
296/ 295 mOsm/L OD/OS
▼
278/ 287 mOsm/L OD/OS
mprovement in tear osmolarity

OMEGA-7 INDEX
0.37% palmitoleic acid
▼
0.93% palmitoleic acid
+151% confirmed systemic uptake

A marked increase in palmitoleic acid levels suggests systemic uptake, consistent with bioavailability of omega-7 from sea buckthorn oil in this patient.

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 downregulates 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 151% increase observed in this case (0.37% → 0.93%) 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, correlated with:

✓ 151% increase in palmitoleic acid levels
✓ Reduction in tear osmolarity
✓ Improvement in inflammatory marker profile (MMP-9)
✓ Clinically meaningful symptom improvement

Improvements were observed within a multimodal treatment approach and occurred despite previous and ongoing omega-3 supplementation, suggesting a potential additional benefit following omega-7 introduction.

These observations highlight the potential adjunctive value of omega-7 nutritional therapy in Sjögren's syndrome with keratoconjunctivitis and support the need for controlled clinical trials.

There were no adverse events or tolerability issues reported.

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