SOSi
Società Oftalmologica Siciliana

Tavola Rotonoda

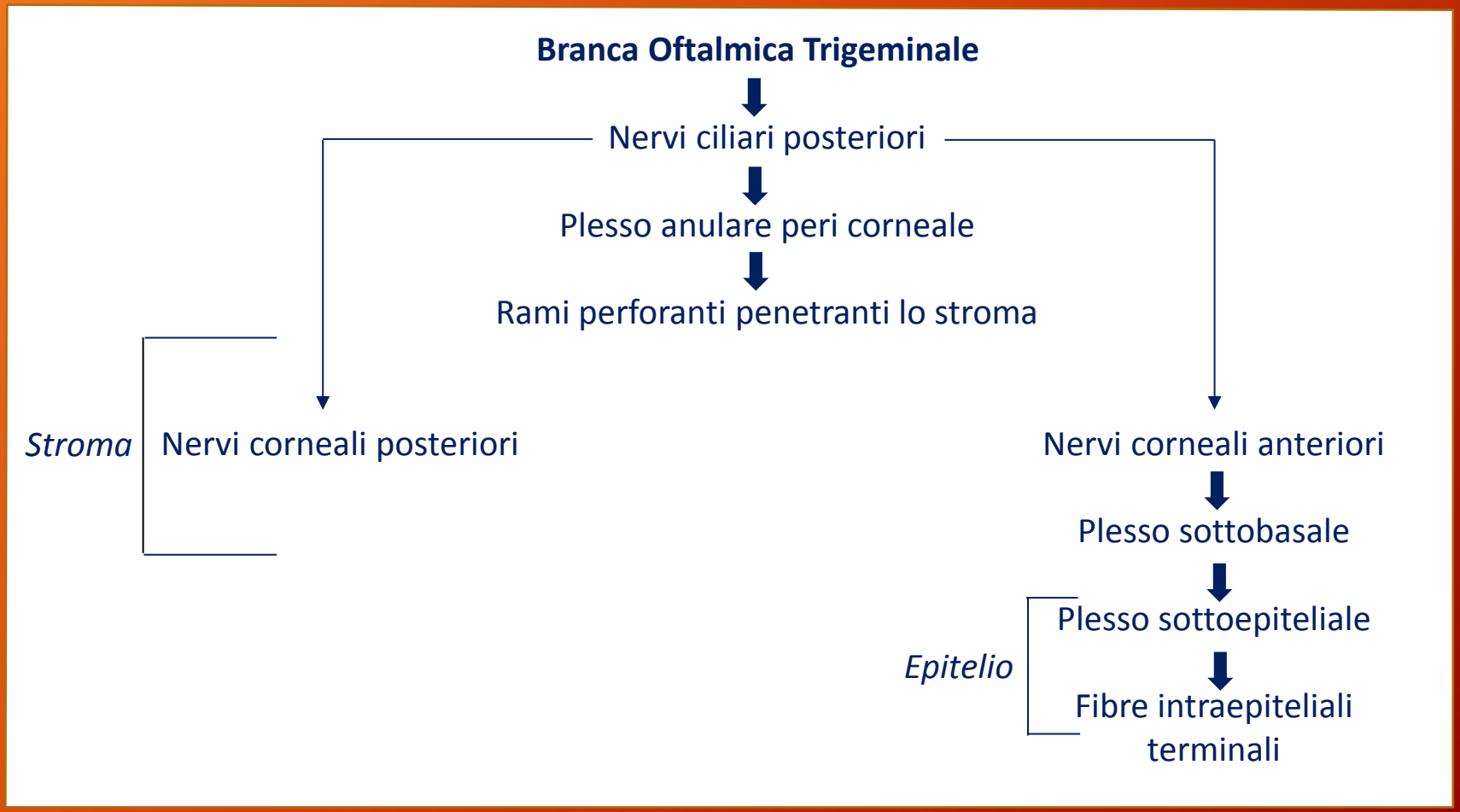
L'Endofarmacologia in Oculistica

Reinnervazione Corneale Post-Chirurgica

C. Migliore

Nervi Corneali e Integrità della Superficie Oculare

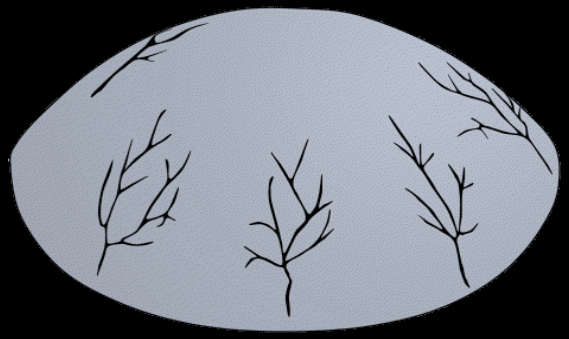
La cornea è uno degli organi a più alta densità di terminazioni nervose periferiche, principalmente di tipo sensitivo, anche se esistono fibre visceri-effettrici appartenenti al sistema simpatico e parasimpatico



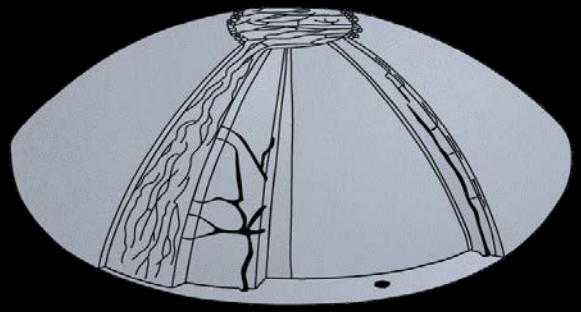
Nervi Corneali e Instabilità della Superficie Oculare

È sempre più evidente il legame tra integrità dei nervi corneali e stabilità della superficie oculare

Radial distribution of stromal nerves

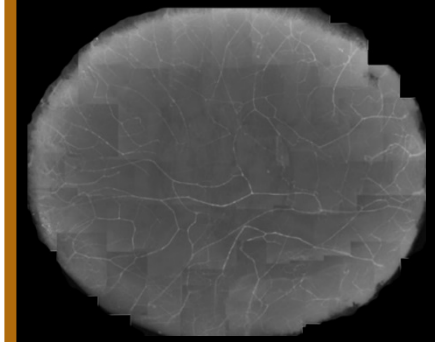


Nerves in Stroma and Sub-Basal Plexus

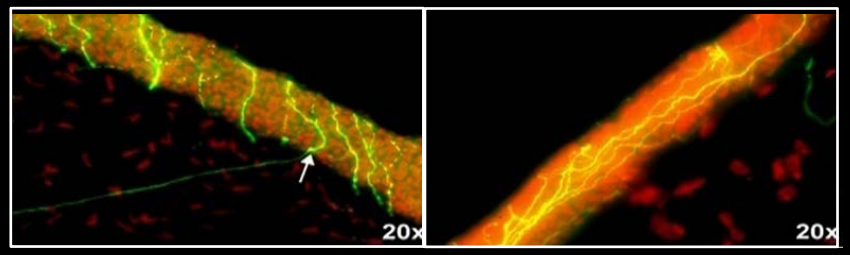


Muller L et al. Exp Eye Res, 2003

Stromal nerves
(Man, 45 years)



Human Epithelial Nerves comes to stroma



He J et al., Exp Eye Res., 2010

Nervi Corneali e Instabilità della Superficie Oculare

Investigative Ophthalmology & Visual Science, September 2004, Vol. 45, No. 9

An In Vivo Confocal Masked Study on Corneal Epithelium and Subbasal Nerves in Patients with Dry Eye

José M. Benítez del Castillo, Mohamed A. S. Wasfy, Cristina Fernandez, and Julian Garcia-Sanchez

Investigative Ophthalmology & Visual Science, July 2012, Vol. 53, No. 8

The Relationship between Subbasal Nerve Morphology and Corneal Sensation in Ocular Surface Disease

Antoine Labbé,[1–4] Haiyan Alalwani,[1,2] Charles Van Went,[1] Emmanuelle Brasnu,[1,2] Dan Georgescu,[1,2,5] and Christophe Baudouin[1–4]

IOVS | August 2013 | Vol. 54 | No. 8 | 5145

Corneal Nerve Structure and Function in Patients With Non-Sjögren Dry Eye: Clinical Correlations

Antoine Labbé,[1–4] Qingfeng Liang,[1] Zhiqun Wang,[1] Yang Zhang,[1] Liang Xu,[1] Christophe Baudouin,[2–4] and Xuguang Sun[1]

Semin Ophthalmol. 2010 : 25(5-6): 171–177. doi:10.3109/08820538.2010.518133.

In Vivo Confocal Microscopy of Corneal Nerves: Analysis and Clinical Correlation

Andrea Cruzat, Deborah Pavan-Langston, and **Pedram Hamrah**
Ocular Surface Imaging Center, Cornea & Refractive Surgery Service, Massachusetts Eye & Ear Infirmary, Harvard Medical School, Boston, MA, USA

Hindawi Publishing Corporation The Scientific World Journal Volume 2013, Article ID 683090, 7 pages

Corneal Sensitivity in Keratoconus: A Review of the Literature

Leopoldo Spadea, Serena Salvatore, and Enzo Maria Vingolo

Investigative Ophthalmology & Visual Science, July 2005, Vol. 46, No. 7

Decreased Corneal Sensitivity in Patients with Dry Eye

Tristan Bourcier,[1,2] M. Carmen Acosta,[2] Vincent Borderie,[1] Fernando Borrás,[3] Juana Gallar,[2] Thierry Bury,[1] Laurent Laroche,[1] and Carlos Belmonte[2]

Nervi Corneali e Instabilità della superficie oculare

Riduzione della sensibilità corneale:

- Riduzione degli impulsi afferenti che stimolano la produzione lacrimale (principalmente componente acquosa)
- Riduzione della frequenza del riflesso di ammiccamento

DIMINUZIONE DEL VOLUME LACRIMALE
PER RIDOTTA PRODUZIONE E AUMENTATA EVAPORAZIONE

↓

DRY-EYE

Il Film Lacrimale

STRATO LIPIDICO

STRATO ACQUOSO E STRATO MUCINICO

FUNZIONI del FILM LACRIMALE

Lubrificante - Nutritiva - Difesa

(mantenimento della salute della superficie oculare)

Fattori biologicamente importanti

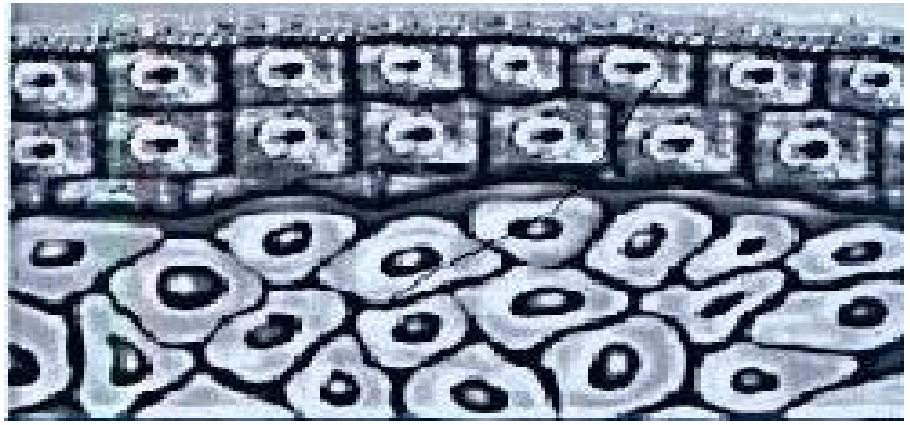
- elettroliti
- albumina
- lattoferrina
- lisozima
- immunoglobuline
- glucosio

Sostanze bioattive

- istamina
- prostaglandine
- interleukine
- fattori di crescita

CORNEA

- **EPITELIO**
- **BOWMAN**
- **STROMA**



Cause che Riducono la Sensibilità Corneale

- Età
- Uso di LAC
- Diabete (maggiormente nell'insulino dipendente)
- Sindrome di Sijogren
- Sclerosi multipla
- Patologie autoimmunitarie
- Chirurgia

Nervi Corneali, Chirurgia Oculare e Neuroinfiammazione

In tutti gli interventi di Chirurgia Oculare viene creato un insulto alla superficie oculare

Chirurgia Refrattiva / Cataratta Cheratoplastica

Taglio dei nervi corneali

Altre Chirurgie

Reattività tissutale

Infiammazione Neurogenica

Nervi Corneali e Chirurgia Oculare

Chirurgia Oculare

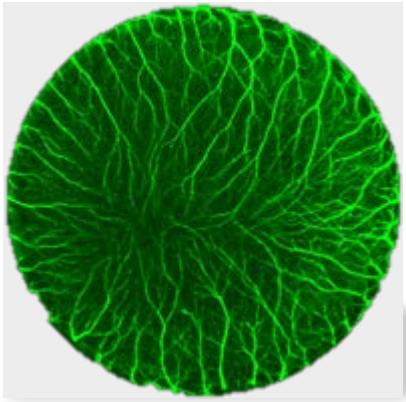
Infiammazione Neurogenica

Ridotta funzionalità dell'arco riflesso

Ridotta produzione di lacrime

Ritardo nel recupero della sensibilità corneale

Nervi Corneali e Chirurgia Oculare



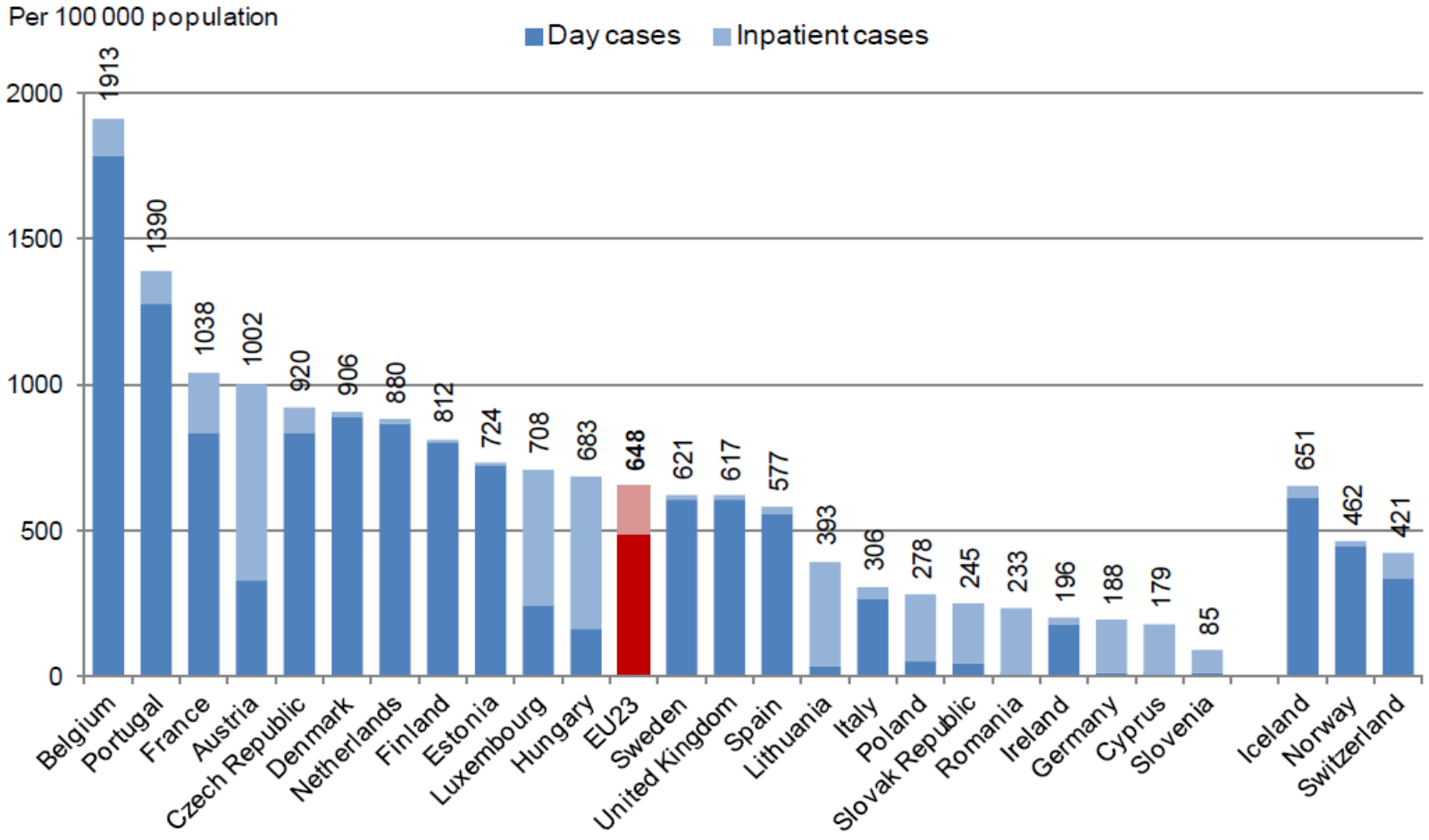
NERVI CORNEALI SUB-BASALI

Il danno ai nervi corneali provoca alterazioni della regolazione nervosa che determina

- **Assenza del processo di cicatrizzazione**
- **Aumento della permeabilità epiteliale**
- **Riduzione dell'attività metabolica epiteliale**

Dry eye

EPIDEMIOLOGY OF CATARACT SURGERY



L'intervento di Cataratta è il più frequente intervento di chirurgie in Europa

Nel 2012 sono stati effettuati 648 interventi di cataratta (ogni 100,000 persone)

Lo scorso anno: 4.808.160 chirurgie della cataratta

(OECD Health data 2012)

Sindrome da Discomfort Oculare post-chirurgia della cataratta

CAUSE

FATTORI PRE-OPERATORI

(malposizioni palpebrali, uso cronico di colliri con conservanti)

FATTORI CHIRURGICI

(uso di midriatici, anestetici, disinfettanti,
effetto fototossico della luce del microscopio,
ma soprattutto le incisioni corneali con la recisione delle fibre nervose

FATTORI POST-OPERATORI

(uso di colliri con conservanti)

Sindrome da Discomfort Oculare post-chirurgia della cataratta

SINTOMI

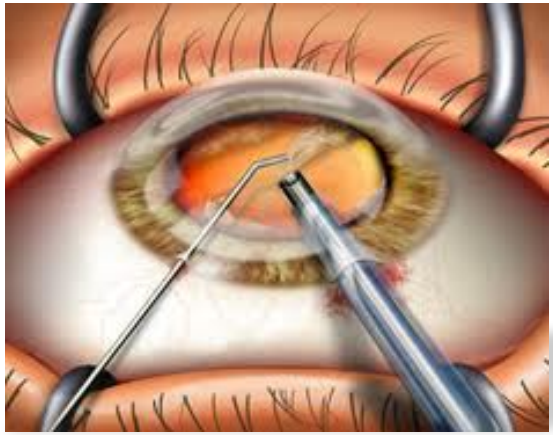
SENSAZIONE DI CORPO ESTRANEO

LACRIMAZIONE

ARROSSAMENTO

FOTOFOBIA

Nervi Corneali e Chirurgia Oculare



CHIRURGIA DELLA CATARATTA

«Sintomi associati al dry-eye si verificano frequentemente (40-87%).
Dopo l'intervento i pazienti lamentano occhio rosso con sensazione di corpo estraneo

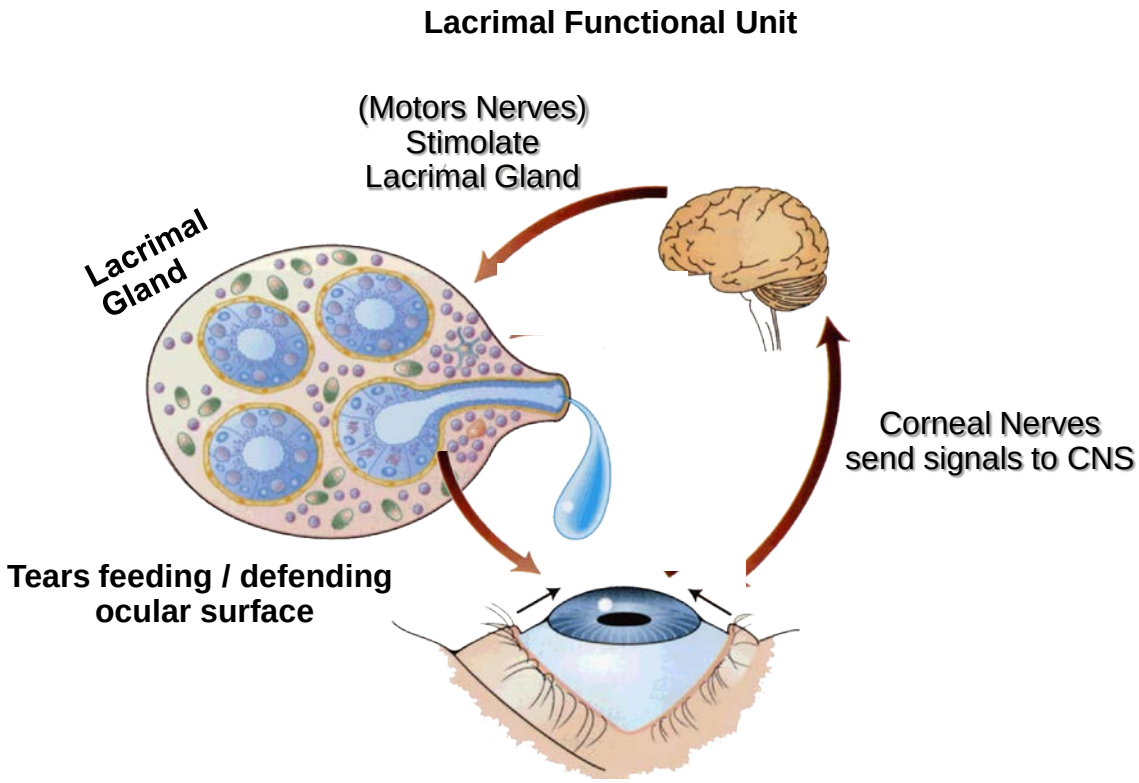
I «sintomi da dry-eye «post-faco» sono presumibilmente dovuti al taglio dei nervi corneali

Le incisioni aggravano la sintomatologia post-operatoria dei pazienti già sofferenti di dry-eye e non

Li H., Cornea 2007; Yang K.C., KJO, 2009; Labbè A., IOVS, 2013

Nervi Corneali e Dry-Eye

I pazienti con dry-eye «semplice»
(cioè conseguente a chirurgia oculare)
hanno nervi corneali meno funzionanti,
bassa produzione di lacrime e instabilità della superficie oculare



Dry-Eye: Terapia Medica Post-chirurgica

Molecole	Pro	Contro
Steroidi	Controllo Infiammazione	Tossicità: ⇧ IOP, ⇩ Riparazione Tissutale ⇩ Neurorigenerazione
FANS	Controllo Infiammazione	Tossicità: Ipolacrimia, scarsa compliance ⇩ Neurorigenerazione
Acidi Grassi Omega 3 (EPA/DHA)	Neuro-rigenerazione Controllo Infiammazione (modulazione)	Minore rapidità d'azione* vs Steroidi e Fans

* In quanto il processo infiammatorio viene modulato dalle resolvine/neuroprotettine.

Omega-3: Evidenza Clinica

L'attività antinfiammatoria degli omega-3 è nota da tempo.
Importanti effetti sono stati osservati in pazienti con artrite reumatoide

Semin Arthritis Rheum. 1997 Oct;27(2):85-97.

Dietary n-3 fatty acids and therapy for rheumatoid arthritis.

James MJ, Cleland LG.
Rheumatology Unit, Royal Adelaide Hospital, Australia.

Abstract

OBJECTIVE: To examine the potential for dietary n-3 fats to be component of therapy for rheumatoid arthritis (RA).

METHODS: Studies of encapsulated fish oil use in RA were reviewed and critiqued, and possible biochemical mechanisms for fish oil effects were examined. The potential for use of n -3 fats was evaluated within a dietary framework rather than a quasi-pharmaceutical framework.

RESULTS: There is consistent evidence from double-blind, placebo-controlled clinical trials that dietary n-3 fats, supplied as fish oil, can have beneficial effects in RA. The beneficial effects appear modest, but their size and extent may have been moderated by common trial design features and possible n-6 enhanced modern fat diets and concurrent anti-inflammatory drug use. Mechanisms for the clinical effects of n-3 fats in RA may involve their ability to suppress production of inflammatory mediators, including n-6 eicosanoids and proinflammatory cytokines. Suppression of n-6 eicosanoid and cytokine production will be possible using foodstuffs that are rich in n-3 fats and poor in n-6 fats.

CONCLUSIONS: There are many overlapping biochemical effects of n-3 fatty acids and antiinflammatory pharmaceuticals that could explain the clinical actions of n-3 fats in RA. They suggest that there is the potential for complementarity between drug therapy and dietary choices that increase intake of n-3 fats and decrease intake of n-6 fats. In particular, there is the potential for drug-sparing effects. Future studies with n-3 fats in RA need to address the fat composition of the background diet and the issue of concurrent drug use.

Results: Numerose evidenze scientifiche supportano gli effetti benefici dell'assunzione di elevati livelli di omega-3 in pazienti con Artrite Reumatoide

Omega-3: Evidenza Clinica

L'attività antinfiammatoria degli omega-3 è nota da tempo.
Importanti effetti sono stati osservati in pazienti con artrite reumatoide

British Journal of Rheumatology 1997;36:513–515

EDITORIALS

RHEUMATOID ARTHRITIS AND THE BALANCE OF DIETARY N-6 AND N-3 ESSENTIAL FATTY ACIDS

In summary, sufficient evidence exists to form the basis for positive health messages that can potentially reduce unwanted inflammation and protect against coronary vascular disease and sudden death. The nub of this advice is to choose foods that provide substantial amounts of n-3 fatty acids (fish, products based on stable polyunsaturated oils, certain nuts). Variety in n-3-rich and/or n-6-poor foodstuffs and ingredients has increased in recent years to make these dietary changes simple and practical procedures. Fish oil supplements can be added for extra effect. At the very least, this information should be made available to patients seeking advice on ways to improve their health by dietary means, with or without conventional medications.

L. G. CLELAND and M. J. JAMES
Rheumatology Unit, Royal Adelaide Hospital, Adelaide, Australia

Le proprietà antinfiammatorie e gli effetti positivi sull'apparato cardiovascolare e sulla salute in genere da parte dei cibi ad elevato contenuto in omega-3, sono ampiamente riconosciute.

Omega-3: Meccanismo d'Azione

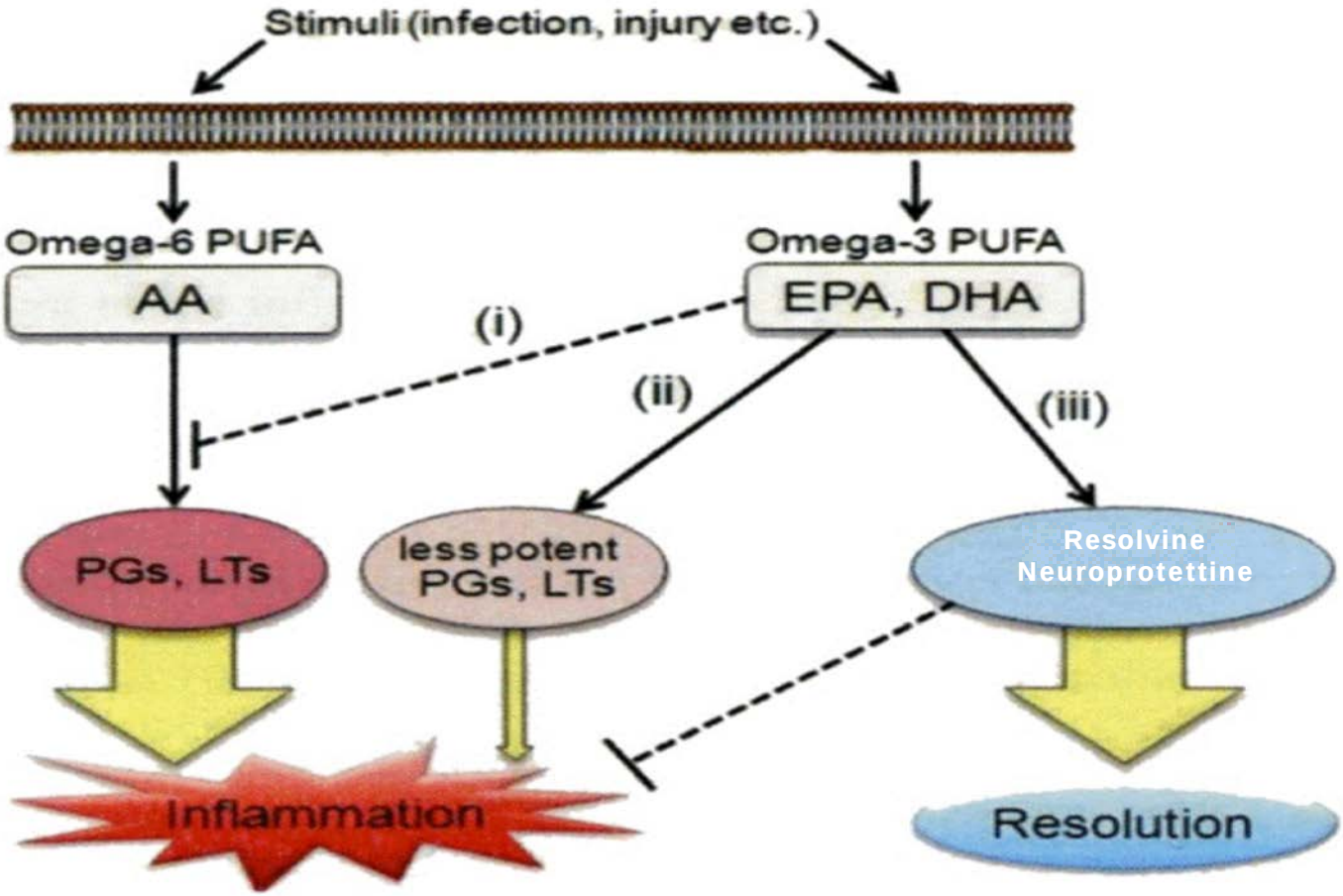


FIGURE 1. Possible mechanisms of the anti-inflammatory actions of ω-3 PUFAs. Omega-3 PUFAs are thought to act via several possible mechanisms: (1) preventing the conversion of AA into proinflammatory eicosanoids, such as 4-series LTs and 2-series PGs via substrate competition; (2) serving as an alternative substrate to produce less potent 5-series LTs and 3-series PGs and thromboxanes; and (3) converting EPA and DHA into bioactive metabolites, such as resolvins with anti-inflammatory and proresolving properties.

Omega-3: EPA e Resolvine

Resolvin E1 Improves Tear Production and Decreases Inflammation in a Dry Eye Mouse Model

Na Li,[1,2] Jiucheng He,[1] Carl Eric Schwartz,[3] Per Gjorstrup,[3] and Haydee E.P. Bazan[1]

Address correspondence to:
Dr. Haydee E.P. Bazan
Neuroscience Center of Excellence
and the Department of Ophthalmology
Louisiana State University Health Sciences Center
2020 Gravier St., Suite D
New Orleans, LA 70112

Abstract

Purpose: Dry eye (DE) is a common ocular surface disease, particularly among women and the elderly, with chronic symptoms of eye irritation and, in severe cases, blurred vision. Several studies have shown that there is an inflammatory component in DE, although the pathogenesis is not thoroughly understood. Resolvin E1 (RvE1; RX-10001) is an endogenous mediator derived from the omega-3 polyunsaturated fatty acid eicosapentaenoic acid and is involved in inflammation resolution and tissue protection. Here we investigated the role of RvE1 in a DE mouse model.
Methods: Thirteen- to 14-week-old female BALB/C mice were exposed to desiccating conditions. One week after DE exposure, animals were treated topically with drug or vehicle 4 times per day for an additional week. C… treatment initiation and at days 2 and 4 after treatment. Inflammatory ocular surface cells was analyzed *in vivo* using the Rostock Cornea Module of the Heidelberg Retina Tomograph (HRT-II). Corneas were processed using W… *Results:* Schirmer's test showed a significant decrease in tear production in DE compared with controls. There was no change at 2 and 4 days after treatment with the vehicle, but a significant increase was observed at 2 and 4 days i… group. The density of the superficial epithelial cells showed a significant decrease after DE compared with controls, which increased after 7 days of RvE1 treatment. Western blot analysis showed that α-smooth muscle actin and cyclooxygenase-2 (COX-2) expression were strongly upregulated after DE and decreased after 7 days of RvE1 treatment. Immunofluorescence confirmed strong positive staining of α-smooth muscle actin and COX-2 in stroma and/or in epithelia after DE, which decreased with RvE1 treatment. The percentage of infiltrating $CD4^+$ T cells and $CD11b^+$ cells decreased after RvE1 treatment when compared with DE.
Conclusion: RvE1 promotes tear production, corneal epithelial integrity, and a decrease in inflammatory inducible COX-2. In the stroma, RvE1 inhibits keratocyte transformation to myofibroblasts and lowers the number of monocytes/macrophages in this DE mouse model. These results suggest that RvE1 and similar resolvin analogs have therapeutic potential in the treatment of DE.

In un modello murino di occhio secco, la Resolvina E1 (RvE1) promuove la produzione di lacrime, l'integrità dell'epitelio corneale e riduce l'infiammazione indotta da COX-2. Nello stroma, inoltre, inibisce la trasformazione dei cheratociti in miofibroblasti e riduce il numero di macrofagi.

N Li, J Ocul Pharmacol Ther, 2010

Omega-3: DHA e Neuroprotettine

LABORATORY SCIENCES

ONLINE FIRST

Recovery of Corneal Sensitivity, Calcitonin Gene-Related Peptide–Positive Nerves, and Increased Wound Healing Induced by Pigment Epithelial–Derived Factor Plus Docosahexaenoic Acid After Experimental Surgery

M. Soledad Cortina, MD; Jiucheng He, MD, PhD; Na Li, MD, PhD; Nicolas G. Bazan, MD, PhD; Haydee E. P. Bazan, PhD

Author Affiliations: Department of Ophthalmology, University of Illinois Medical Center, Chicago (Dr Cortina); and Department of Ophthalmology and Neuroscience Center of Excellence, Louisiana State University Health Sciences Center, New Orleans (Drs He, Li, N. G. Bazan, and H. E. P. Bazan).

Objective: To assess function of regenerated corneal nerves in correlation with epithelial wound healing after experimental nerve damage in rabbits treated with pigment epithelial–derived factor (PEDF) plus docosahexaenoic acid (DHA).

Methods: An 8-mm stromal dissection was performed in the right eyes of adult New Zealand rabbits. Treatment with PEDF+DHA was for 6 weeks. Corneal sensation was measured weekly by Cochet-Bonnet esthesiometer. After 8 weeks, immunofluorescence with βIII-tub... P antibodies was performed to quantify nerves. Also, rabbits ... mellar keratectomy, followed by 8-mm epithelial de... bridement and epithelial defect assessment. One week aft... body to assess cell proliferation.

Results: Eight weeks after surgery, calcitonin gene-related peptide–positive nerve fibers in the PEDF+DHA group were similar to normal rabbit corneas but were decreased in the vehicle. Substance P was localized in the subepithelial plexus but appeared in epithelial cells after nerve injury regardless of treatment. Five weeks after surgery, an increase in corneal sensitivity occurred in the PEDF+DHA group and reached normal values by 8 weeks. Pigment epithelial–derived factor plus DHA increased epithelial wound healing after lamellar keratectomy. One week after epithelial injury, Ki67-positive cells increased in the limbal area.

Conclusion: Pigment epithelial–derived factor plus DHA promotes regeneration of calcitonin gene-related peptide–... wound healing and ... sensitivity.

Conclusioni: Il DHA in associazione con il Fattore Derivato dall'Epitelio Pigmentato (PEDF), promuove la rigenerazione dei nervi corneali positiva al peptide correlato al gene della calcitonina, accelerando la cicatrizzazione e il ripristino della sensibilità corneale

Arch Ophthalmol. 2012;130(1):76-83.
Published online September 12, 2011.
doi:10.1001/archophthalmol.2011.287

Omega-3: DHA e Neuroprotettine

Prostaglandins, Leukotrienes and Essential Fatty Acids 88 (2013) 27–31

Contents lists available at SciVerse ScienceDirect

Prostaglandins, Leukotrienes and Essential Fatty Acids

journal homepage: www.elsevier.com/locate/plefa

Involvement of pigment epithelium-derived factor, docosahexaenoic acid and neuroprotectin D1 in corneal inflammation and nerve integrity after refractive surgery

Il Fattore Derivato dall'Epitelio Pigmentato (PEDF) è rilasciato dall'epitelio corneale in conseguenza dell'insulto chirurgico ai nervi stromali e favorisce, in presenza di DHA, la biosintesi di Neuroprotettina D1 (NPD1), molecola ad attività antinfiammatoria e neurorigeneratrice.

ABSTRACT

Alterations in corneal innervations result in impaired corneal sensation, severe dry eye and damage to the epithelium that may in turn lead to corneal ulcers, melting and perforation. These alterations can occur after refractive surgery. We have discovered that pigment epithelium-derived factor (PEDF) plus docosahexaenoic acid (DHA or the docosanoid bioactive neuroprotectin D1 (NPD1)) induces nerve regeneration after corneal surgery that damages the stromal nerves. We found that PEDF is released from corneal epithelial cells after injury, and when DHA is provided to the cells it stimulates the biosynthesis of NPD1 by an autocrine mechanism. The combination of PEDF plus DHA also decreased the production of leukotriene B4 (LTB4), a neutrophil chemotactic factor, thereby decreasing the inflammation induced after corneal damage. These studies suggest that PEDF plus DHA and its derivative NPD1 hold promise as a future treatment to restore a healthy cornea after nerve damage.

Kenchegowda S, Prostaglandins Leukot Essent Fatty Acids, 2013

Omega-3 orali: Ruolo nella riduzione del discomfort oculare

THE ROLE OF OMEGA-3 DIETARY SUPPLEMENTATION IN BLEPHARITIS AND MEIBOMIAN GLAND DYSFUNCTION (AN AOS THESIS)

BY Marian S. Macsai MD

Trans Am Ophthalmol Soc 2008;106:336-356

Short-term Consumption of Oral Omega-3 and Dry Eye Syndrome

Ophthalmology 2013;120:2191-2196

Haleh Kangari, OD, PhD,[1] Mohammad Hossein Eftekhari, MD,[2] Sara Sardari, MSc,[1] Hassan Hashemi, MD,[3] Jamshid Salamzadeh, PhD,[4] Mohammad Ghassemi-Broumand, MD,[5] Mehdi Khabazkhoob, MSc[6]

Epithelial Healing and Visual Outcomes of Patients Using Omega-3 Oral Nutritional Supplements Before and After Photorefractive Keratectomy: A Pilot Study

Nikki Heidi Ong, MD, Tracy L. Purcell, PhD, Anne-Catherine Roch-Levecq, PhD, Dorothy Wang, OD, Marichelle A. Isidro, MD, Katia M. Bottos, MD, Christopher W. Heichel, MD, and David J. Schanzlin, MD

Cornea • Volume 32, Number 6, June 2013

Omega-3 orali: Ruolo nella riduzione del discomfort oculare

A randomized controlled trial of omega–3 fatty acids in dry eye syndrome

Int J Ophthalmol, Vol. 6, No. 6, Dec.18, 2013

Rahul Bhargava [1], Prachi Kumar [2], Manjushrii Kumar [3], Namrata Mehra [1], Anurag Mishra [1]

A randomized, double-masked study to evaluate the effect of omega-3 fatty acids supplementation in meibomian gland dysfunction

Clinical Interventions in Aging 2013:8 1133–1138

Andrea Oleñik[1]
Ignacio Jiménez-Alfaro[1]
Nicolás Alejandre-Alba[1]
Ignacio Mahillo-Fernández[2]

Effectiveness and tolerability of dietary supplementation with a combination of omega-3 polyunsaturated fatty acids and antioxidants in the treatment of dry eye symptoms: results of a prospective study

Andrea Oleñik

On behalf of the Dry Eye Clinical Study Group (DECSG)

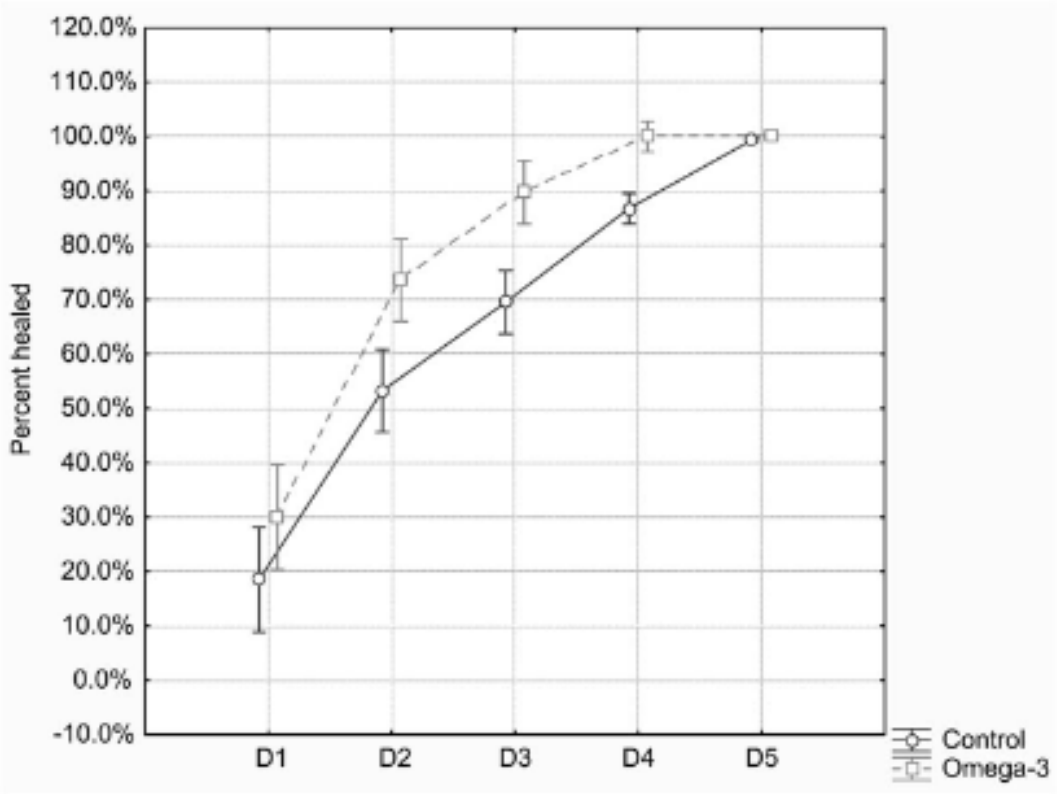
Clinical Ophthalmology 2014:8 169–176

Omega-3 orali: Ruolo nella riduzione del discomfort oculare

Gli omega-3,

somministrati oralmente per 2 settimane prima dell'intervento e per 1 mese dopo,

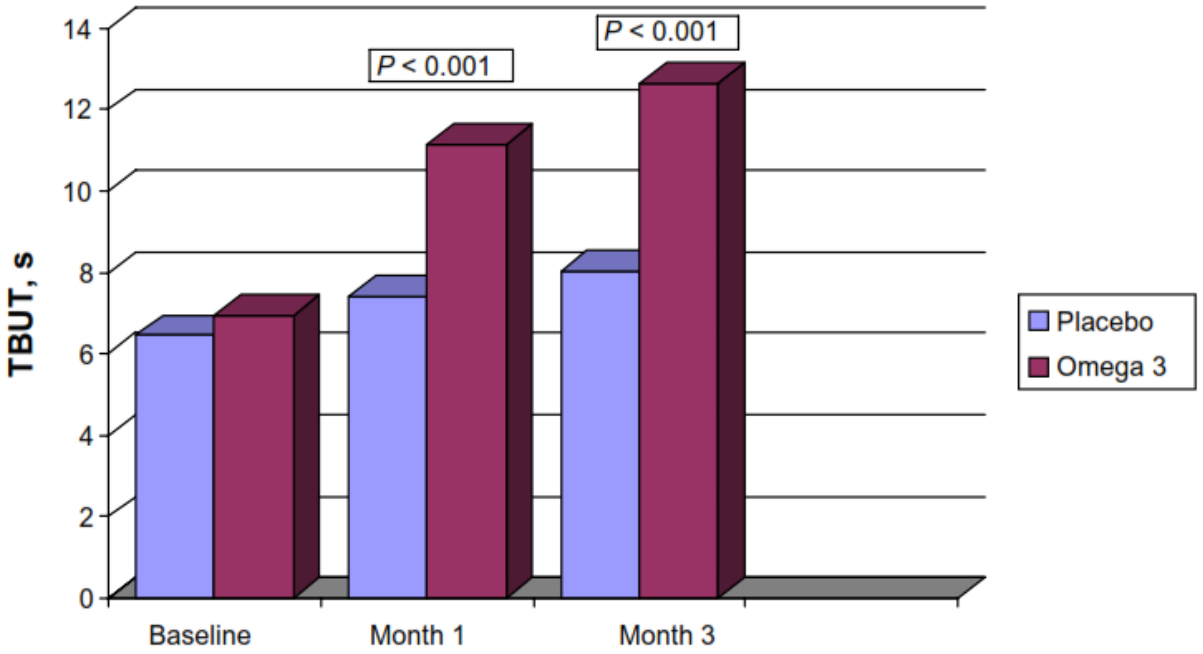
riducono il tempo di riepitelizzazione



Ong NH, Cornea, 2013

Omega-3 orali: Ruolo nella riduzione del discomfort oculare

Gli omega-3,
somministrati oralmente per 1 e 3 mesi, ***migliorano significativamente il TFBUT,***
rispetto al placebo in pazienti con MGD



Olenik A, Clin Int Aging, 2013

Omega-3: Meccanismo d'Azione

Le Resolvine

Effetti sulla superficie oculare

Inibiscono l'espressione delle citochine infiammatorie

Aumentano la produzione di lacrime

Hanno effetto analgesico

Rallentano l'attivazione mastocitaria

N.Li, J. He, H.E.P. Bazan, ARVO E-Abstract 2008

ZZ Xu et al. , Nature Medicine, 16, 592-597, 2010

Omega-3: Meccanismo d'Azione

Le Neuroprotettine

Effetti sulla superficie oculare

Accelerano la reinnervazione corneale

Riducono l'espressione di citochine infiammatorie

Hanno effetto analgesico

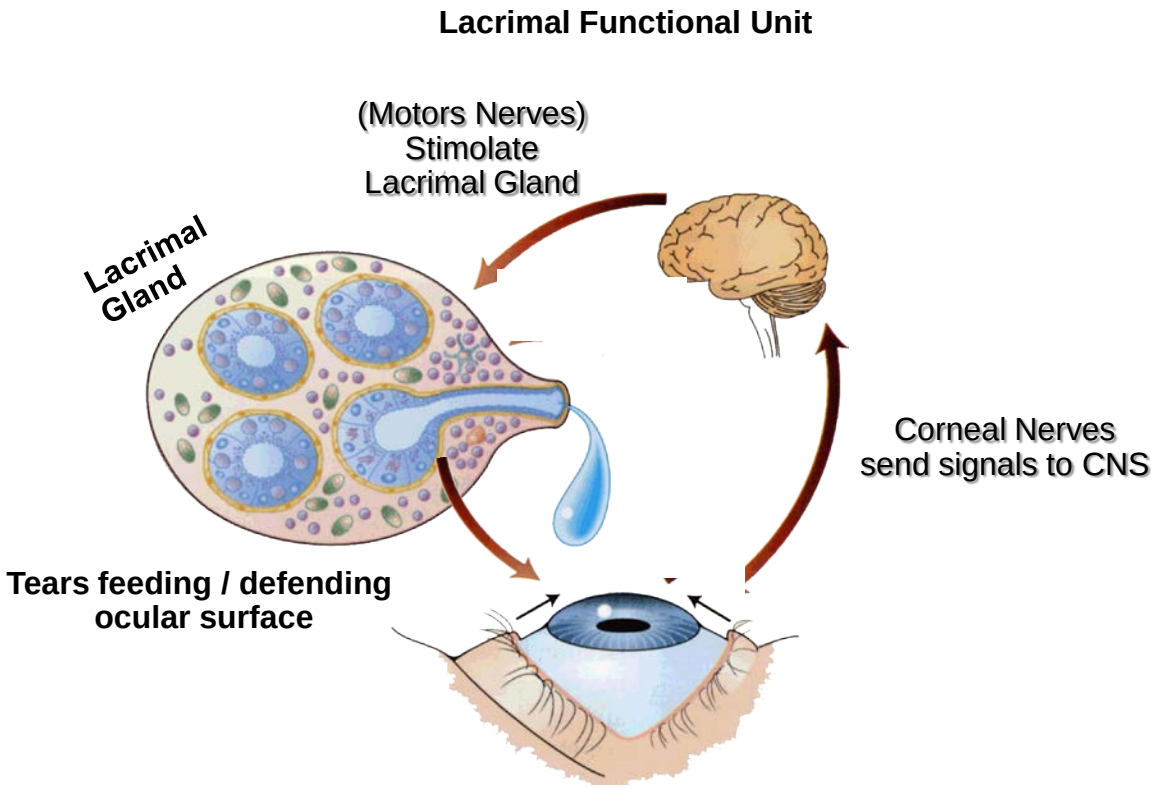
Proteggono la superficie oculare da erosioni e ulcerazioni corneali

ZZ Xu et al. , Nature Medicine, 16, 592-597, 2010

J.He, H.E.P. Bazan, Prostaglandins, Leukotrienes and Essential Fatty Acids, 82, 319-325, 2010

Nervi Corneali e Dry-Eye

Il DHA in associazione a fattori di crescita
(NGF / PEDF già disponibili sulla superficie oculare)
è in grado di favorire la rigenerazione dei nervi corneali
dopo chirurgia oculare



Evidenza Clinica

Studio prospettico, in aperto, di confronto tra l'impiego di un sostituto lacrimale a base di HA 0,2% e di un collirio + terapia sistemica a base di EPA/DHA somministrati 3 giorni prima e 28 giorni dopo l'intervento di cataratta

Evidenza Clinica

Studio prospettico, in aperto, di confronto tra l'impiego di un sostituto lacrimale a base di HA 0,2% e di un collirio + terapia sistemica a base di EPA/DHA somministrati 3 giorni prima e 28 giorni dopo l'intervento di cataratta

Pazienti	Gruppo 1	Gruppo 2
Età Media	63±3	64±2
Sesso	44% F; 56% M	42% F; 58% M

Evidenza Clinica: Disegno dello Studio

500 pazienti candidati ad intervento di cataratta

250 pazienti	250 pazienti
Terapia PRE-OPERATORIA (3 giorni prima dell'intervento)	
Netilmicina-Desametasone (monodose) 3 gtt/d	Netilmicina-Desametasone (monodose) 3 gtt/d
Diclofenac (monodose) 3 gtt/d	Diclofenac (monodose) 3 gtt/d
HA 0,2% (monodose) 3 gtt/d	**EPA/DHA collirio (monodose) 3 gtt/d** + **EPA/DHA > 90% Capsule 1/d**
Terapia POST-OPERATORIA	
Netilmicina-Desametasone (monodose) 3 gtt/d per 21 gg	Netilmicina-Desametasone (monodose) 3 gtt/d per 21 gg
Diclofenac (monodose) 3 gtt/d per 21 gg	Diclofenac (monodose) 3 gtt/d per 21 gg
HA 0,2% (monodose) 3 gtt/d per 28 gg	**EPA/DHA collirio (monodose) 3 gtt/d** + **EPA/DHA > 90% Capsule 1/d per 28 gg**

Standardizzazione Intervento

Stesso chirurgo

Midriasi con Tropicamide-Fenilefrina, Ciclopentolato (tre somministrazioni)

Anestesia topica con Ossibuprocaina cloridrato 0,4% monodose (quattro somministrazioni)

Disinfezione cutanea palpebrale con Iodopovidone 10%

Disinfezione del fornice congiuntivale con Iodopovidone 5%

Incisione Temporale in cornea chiara, senza pretaglio, di 2,4 mm

Due incisioni accessorie di circa 1mm

Stesso viscoelastico

Cefuroxima intracamerale

Evidenza Clinica: Metodi

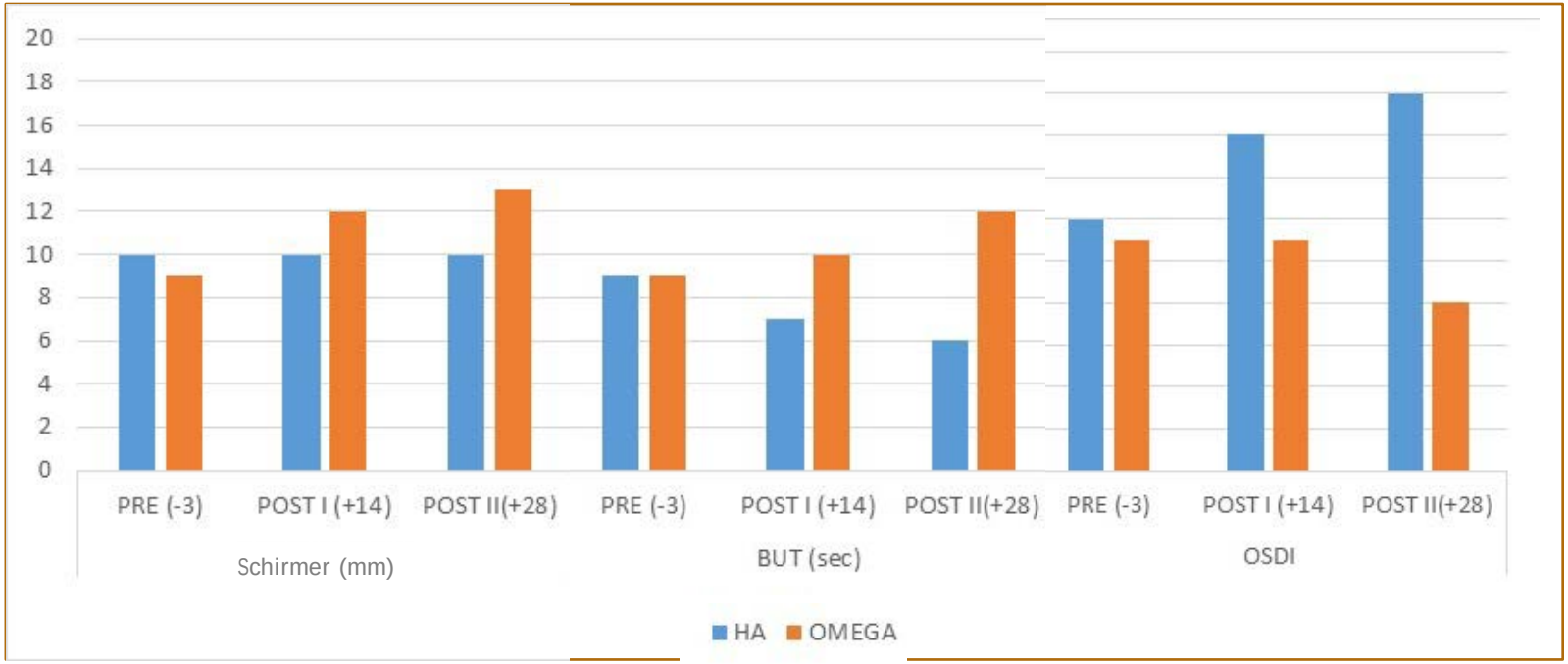
Valutazioni cliniche
BUT
Schirmer I
Questionario OSDI

Tempo *0* = *3 giorni prima dell'intervento*

Tempo I = *14 gg dopo l'intervento*

Tempo II = *28 gg dopo l'intervento*

Evidenza Clinica: Risultati



CONCLUSIONI

I dati del nostro studio dimostrano un miglioramento del quadro clinico nei pazienti trattati con Omega 3

BUT
Schirmer I
OSDI

} **VALORI PARAGONABILI ALLO STATO PRE-CHIRURGICO**

Sensazione di corpo estraneo scesa a
1,20% nei pazienti omega 3 vs il **27%** nei pazienti con HA

La terapia con Omega-3

FAVORISCE I PROCESSI DI NEURORIGENERAZIONE

MANTIENE L'OMEOSTASI DELLA SUPERFICIE OCULARE

RIDUCE I TEMPI DI GUARIGIONE DELLA FERITA CHIRURGICA

MIGLIORA IL RISULTATO NEURO-FUNZIONALE

TAKE HOME MESSAGE