UNIVERSITÀ DEGLI STUDI DI BARI "Aldo Moro"
SCUOLA DI SPECIALIZZAZIONE IN OFTALMOLOGIA
DIPARTIMENTO DI SCIENZE MEDICHE DI BASE, NEUROSCIENZE E ORGANI DI SENSO
UNITA' OPERATIVA OFTALMOLOGIA UNIVERSITARIA
Direttore: Prof. Giovanni Alessio

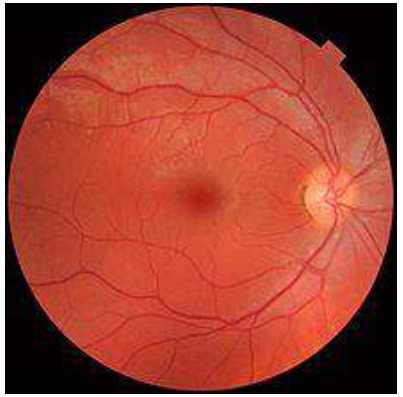
NUOVI BIOMARKER NEURO-OFTALMOLOGICI NELLA MALATTIE NEUROLOGICHE

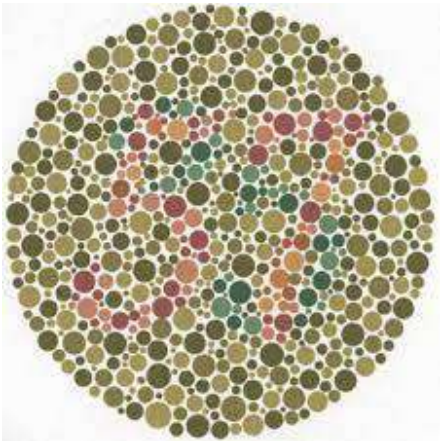
Dario Sisto

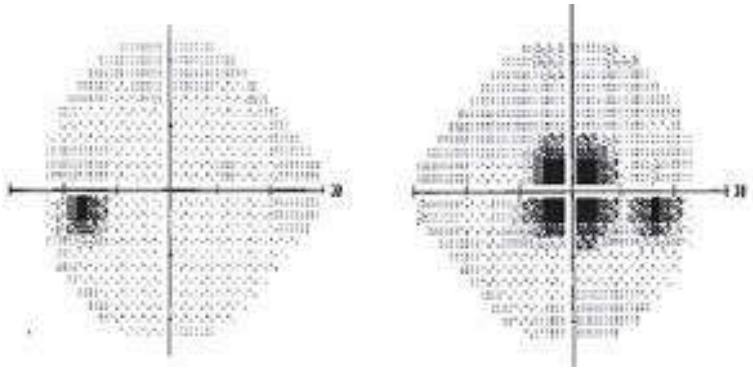
Riunione annuale SIN Appulo-lucana

Bari, 3-4 novembre 2022

MSNON



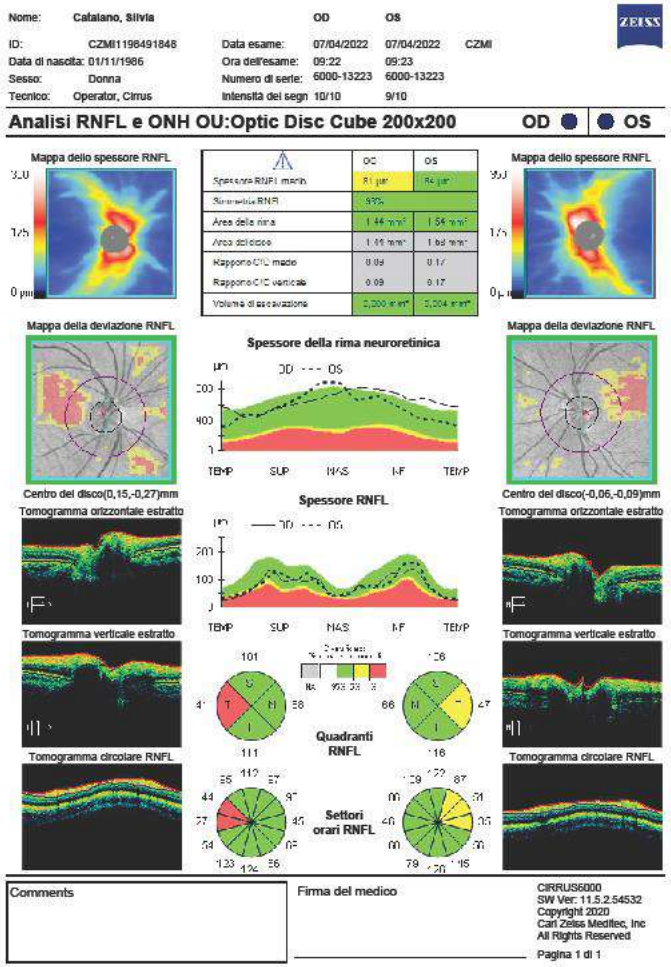




Subclinical Visual Involvement in Multiple Sclerosis: A Study by MRI, VEPs, Frequency-Doubling Perimetry, Standard Perimetry, and Contrast Sensitivity

Dario Sisto,[1] *Maria Trojano,*[2] *Michele Vetrugno,*[1] *Tiziana Trabucco,*[1] *Giovanni Iliceto,*[2] *and Carlo Sborgia*[1]

(*Invest Ophthalmol Vis Sci.* 2005;

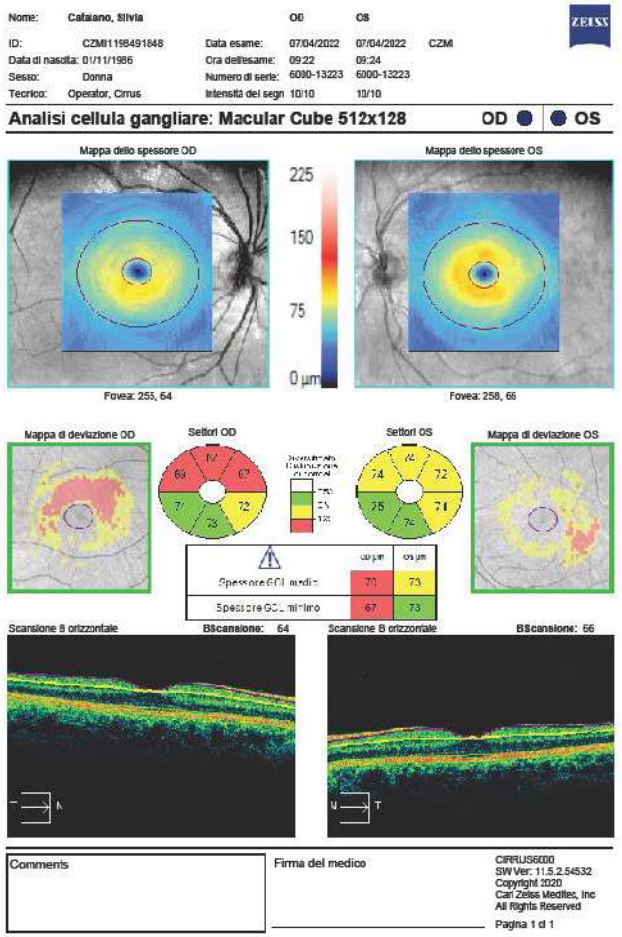


RNFL

OCT

Petzold

Pietrobuoni



RGC

Retinal layer segmentation in multiple sclerosis: a systematic review and meta-analysis

Dr Axel Petzold, PhD • Prof Laura J Balcer, MD • Prof Peter A Calabresi, MD • Prof Fiona Costello, MD • Teresa C Frohman, MD • Prof Elliot M Frohman, MD • et al. Show all authors • Show footnotes

Published: October, 2017 • DOI: https://doi.org/10.1016/S1474-4422(17)30278-8 • Check for updates

Findings

Of 25 497 records identified, 110 articles were eligible and 40 reported data (in total 5776 eyes from patients with multiple sclerosis [1667 MSON eyes and 4109 MSNON eyes] and 1697 eyes from healthy controls) that met published OCT quality control criteria and were suitable for meta-analysis. Compared with control eyes, the peripapillary retinal nerve fibre layer (RNFL) showed thinning in MSON eyes (mean difference −20·10 µm, 95% CI −22·76 to −17·44; p<0·0001) and in MSNON eyes (−7·41 µm, −8·98 to −5·83; p<0·0001). The macula showed RNFL thinning of −6·18 µm (−8·07 to −4·28; p<0·0001) in MSON eyes and −2·15 µm (−3·15 to −1·15; p<0·0001) in MSNON eyes compared with control eyes. Atrophy of the macular ganglion cell layer and inner plexiform layer (GCIPL) was −16·42 µm (−19·23 to −13·60; p<0·0001) for MSON eyes and −6·31 µm (−7·75 to −4·87; p<0·0001) for MSNON eyes compared with control eyes. A small degree of inner nuclear layer (INL) thickening occurred in MSON eyes compared with control eyes (0·77 µm, 0·25 to 1·28; p=0·003). We found no statistical difference in the thickness of the combined outer nuclear layer and outer plexiform layer when we compared MSNON or MSON eyes with control eyes, but we found a small degree of thickening of the combined layer when we compared MSON eyes with MSNON eyes (1·21 µm, 0·24 to 2·19; p=0·01).

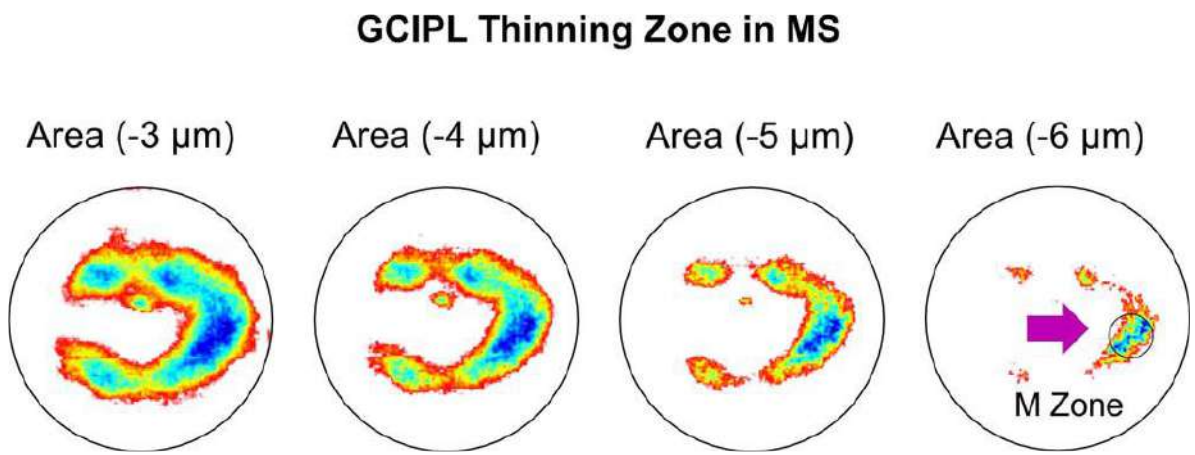
Studi di spessore

- Riduzione spessore RNFL 0,5-1,5µ/anno (v.n. 0,1µ/anno) nei primi tre anni poi minore (effetto plateau)
- Riduzione spessore RGC 0,9µ/anno (v.n. 0,4µ/anno) nei primi tre anni poi minore (effetto plateau)
- Correlazione negativa di spessore RNFL e RGC con EDSS (da -0,40 a -0,51, non confermate da altri studi)
- Pazienti con spessore RNFL 87-88µ al baseline hanno un rischio doppio di sviluppare progressione EDSS in 3 anni, e quadruplo in 5 anni

Visual Function and Disability Are Associated With Focal Thickness Reduction of the Ganglion Cell-Inner Plexiform Layer in Patients With Multiple Sclerosis

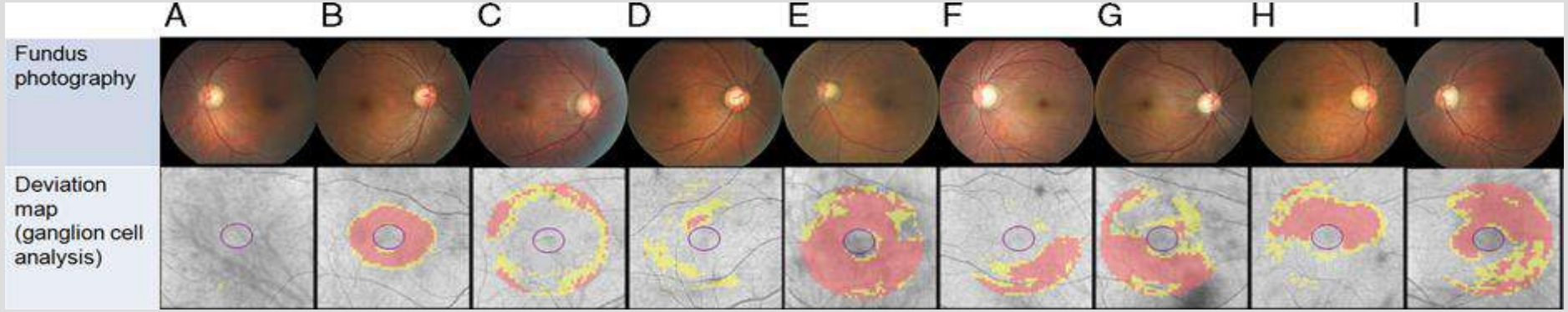
Ce Shi,[1,2] Hong Jiang,[2,3] Giovana Rosa Gameiro,[2] Huiling Hu,[1,4] Jeffrey Hernandez,[3] Silvia Delgado,[3] and Jianhua Wang[2]

Citation: Shi C, Jiang H, Gameiro GR, et al. Visual function and disability are associated with focal thickness reduction of the ganglion cell-inner plexiform layer in patients with multiple sclerosis. *Invest Ophthalmol Vis Sci.* 2019;60:1213–1223. https://doi.org/10.1167/iovs.18-25809



Pattern of Macular Ganglion Cell-Inner Plexiform Layer Defect Generated by Spectral-Domain OCT in Glaucoma Patients and Normal Subjects

Jae Seung Jeong, MD, Min Gu Kang, MD,* Chan Yun Kim, MD, PhD,† and Na Rae Kim, MD, PhD**



A minimo
B interno
C esterno
D diffuso lieve
E diffuso grave
F inferiore
G prevalentemente inferiore
H superiore
I prevalentemente superiore

		Normali N (%)		SMNON N(%)
		(n=34)		(n=34)
Generali				
minimo		0		1(2,9)
interno		**0**		**15 (44.1)**
esterno		7(20,6)		3(8,8)
diffuso lieve		1(2,9)		0
diffuso severo		0		0
Localizzati				
inferiore		0		0
prev. Inferiore		2(5,9)		2(5,9)
superiore		0		0
prev superiore		0		0

Original research article

EJO European Journal of Ophthalmology

Macular ganglion cell-inner plexiform layer defect patterns in multiple sclerosis patients without optic neuritis: A Spectral-Domain-Optical Coherence Tomography Cross-Sectional, Case-Control, Pilot Study

European Journal of Ophthalmology
1–10

DOI: 10.1177/11206721221112803
journals.sagepub.com/home/ejo
SAGE

Valeria Albano[1], Rosanna Dammacco[1], Alessia Manni[2], Dario Sisto[1], Antonio Iaffaldano[2], Alberto Mavilio[3], Giovanni Alessio[1], Maria Trojano[2] and Damiano Paolicelli[1]

IL NOSTRO STUDIO

- ✓ Capire se il pattern interno può essere considerato specifico di SM
- ✓ Correlazione pattern/dati di spessore con la durata della malattia e con EDSS
- ✓ Differenze uomo/donna nei valori OCT
- ✓ Valutare l'OCT come biomarker

IL NOSTRO STUDIO

87 OCCHI

70 OCCHI
MSNON

17 OCCHI
CONTROLLO

- *BCVA*
- *Tonometria*
- *Esame del segmento anteriore*
- *Esame del segmento posteriore*
- *OCT di RNFL e di GCL*

p-RNFL
Medio
Superiore
Inferiore
Temporale
Nasale

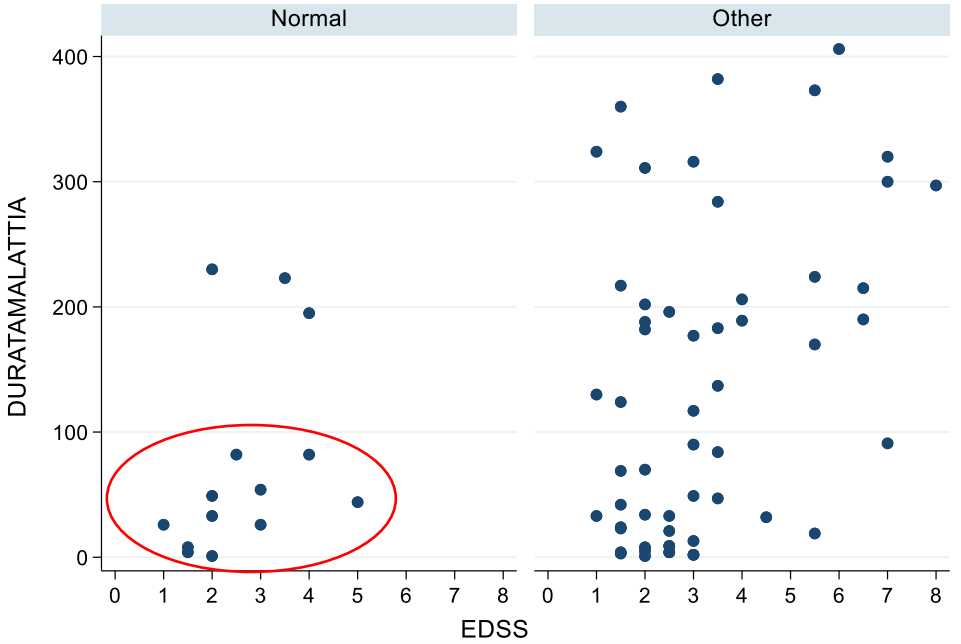
GCL
Medio
Minimo
Superiore
Supero-nasale
Infero-nasale
Inferiore
Infero-temporale
Supero-temporale

RISULTATI - SPESSORE

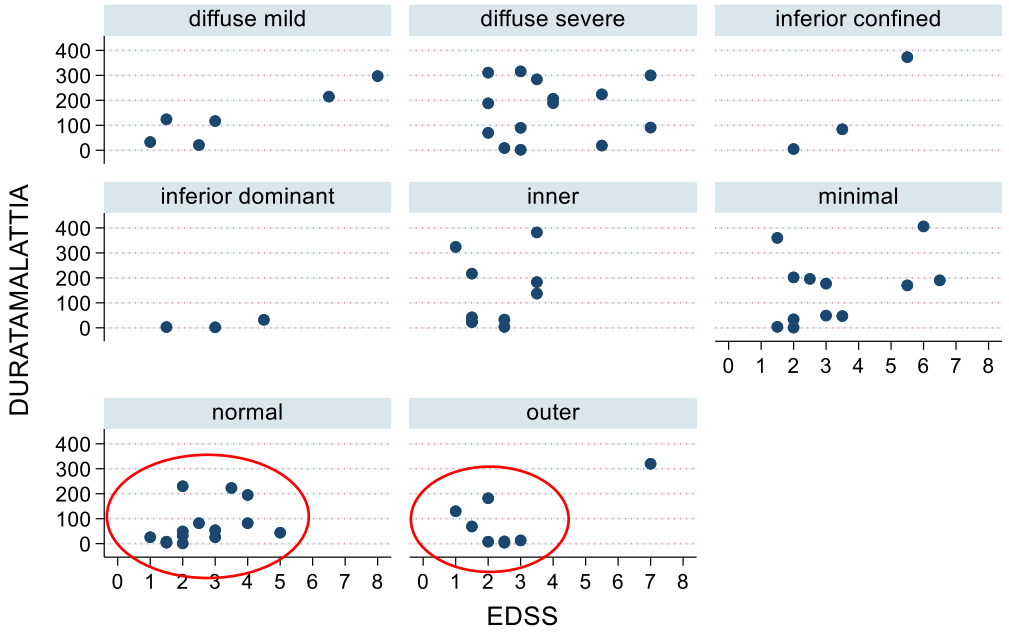
		MALATO				
		NO (n=17)		SI (n=70)		P
IOP	(mean, sd)	13.35	1.62	15	1.9	0.001
RNFL-AV	(mean, sd)	86.65	8.67	85.93	11.49	0.810
RNFL-S	(mean, sd)	108.18	14.53	106.5	15.97	0.694
RNFL-I	(mean, sd)	114.89	16.34	112.27	18.51	0.596
RNFL-T	(mean, sd)	65.41	12.12	56.63	10.87	0.004
RNFL-N	(mean, sd)	61.47	8.49	67.84	12.55	0.051

		MALATO				
GCL		NO (n=17)		SI (n=70)		P
Average	(mean, sd)	80.94	7.21	74.94	8.32	0.008
Min	(mean, sd)	76.71	10.96	72.29	9.27	0.093
S	(mean, sd)	82.47	7.35	76.11	8.94	0.008
SN	(mean, sd)	81.82	8.19	74.97	8.77	0.004
IN	(mean, sd)	79.18	7.8	74.84	7.13	0.075
I	(mean, sd)	78.24	9.03	74.46	9.46	0.140
IT	(mean, sd)	82.76	7.96	75.63	9.06	0.004
ST	(mean, sd)	80.76	6.94	75.84	8.93	0.041

		MALATO				
PATTERN		NO		SI		
		n	%	n	%	P
Diffuse						
	Mild	1	5.88	6	8.57	0.817
	Severe	0	0	14	20	0.179
Inferior						
	Confined	0	0	3	4.29	0.999
	Dominant	2	11.76	3	4.29	0.360
Inner		0	0	10	14.29	0.318
Minimal		0	0	12	17.14	0.224
Normal		7	41.18	14	20	0.179
Outer		7	41.18	8	11.43	0.064



SCATTERPLOT



		Femmina N=49		Maschio N=21		P
IOP	(mean, sd)	14.94	1.85	15.14	2.03	0.683
	(median, Q1-Q3)	16	14-16	16	14-16	
RNFL AV	(mean, sd)	85.55	11.18	86.81	12.42	0.678
	(median, Q1-Q3)	84	81-91	85	80-91	
RNFL-S	(mean, sd)	106.22	14.62	107.14	19.13	0.827
	(median, Q1-Q3)	106	96-118	106	100-115	
RNFL-I	(mean, sd)	112.88	18.68	110.86	18.47	0.679
	(median, Q1-Q3)	115	98-125	106	97-123	
RNFL-T	(mean, sd)	56.16	11.7	57.71	8.77	0.588
	(median, Q1-Q3)	55	48-65	58	54-62	
RNFL-N	(mean, sd)	66.22	10.87	71.62	15.45	0.100
	(median, Q1-Q3)	66	58-74	71	60-81	

GCL		Femmina (n=49)		Maschio (n=21)		P
Average	(mean, sd)	74.14	8.17	76.81	8.59	0.222
Min	(mean, sd)	71.55	9.26	74.00	9.27	0.315
S	(mean, sd)	75.67	8.99	77.14	8.95	0.533
SN	(mean, sd)	74.65	8.57	75.71	9.38	0.646
IN	(mean, sd)	74.39	9.02	75.9	9.51	0.528
I	(mean, sd)	73.71	9.16	76.19	10.13	0.319
IT	(mean, sd)	74.18	8.71	79.00	9.15	0.041
ST	(mean, sd)	74.73	9.05	78.76	8.17	0.084

CORRELAZIONE CON EDSS

	Tot (n=70)		Donne(n=49)		Uomini(n=21)	
	r	p	r	p	r	p
IOP	0.13	0.289	0.22	0.121	-0.06	0.800
RNFL_AV	-0.21	0.079	-0.28	0.052	-0.13	0.577
RNFL_S	-0.32	0.007	-0.43	0.002	-0.19	0.400
RNFL_I	-0.31	0.010	-0.30	0.035	-0.31	0.171
RNFL_T	-0.01	0.917	-0.01	0.952	-0.07	0.769
RNFL_N	0.08	0.534	-0.07	0.616	0.20	0.387
GCL_AV	-0.25	0.036	-0.35	0.015	-0.18	0.445
GCL_MIN	-0.29	0.014	-0.39	0.006	-0.20	0.392
GCL_S	-0.27	0.023	-0.34	0.015	-0.19	0.409
GCL_SN	-0.22	0.064	-0.28	0.052	-0.16	0.485
GCL_IN	0.26	0.028	0.34	0.015	0.17	0.460

CORRELAZIONE CON DURATA DELLA MALATTIA

	Tot (n=70)		Donne (n=49)		Uomini (n=21)	
	r	p	r	P	r	p
IOP	0.10	0.408	0.16	0.259	-0.04	0.857
RNFL_AV	-0.32	0.007	-0.33	0.022	-0.29	0.200
RNFL_S	-0.39	0.001	-0.37	0.010	-0.46	0.037
RNFL_I	-0.29	0.017	-0.28	0.055	-0.32	0.154
RNFL_T	-0.38	0.001	-0.39	0.006	-0.33	0.148
RNFL_N	0.11	0.362	0.11	0.459	0.16	0.485
GCL_AV	-0.31	0.008	-0.30	0.036	-0.34	0.133

CONCLUSIONI

L’OCT può essere considerato un biomarker?
Può aiutare il clinico nel monitoraggio della Sclerosi Multipla?

Aumento della numerosità del campione
Studio longitudinale