

Ocular Surface Disease Parameters After Corneal Cross-Linking for Keratoconus

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Purpose

To analyse the variations in tear quantity or quality in patients with keratoconus after corneal collagen cross-linking (CXL) .

Methods

24 patients with keratoconus underwent epi-off CXL.

Studied variables

- Tear film osmolarity (OSM),
- Subjective symptoms (OSDI Index),
- Tear Break-Up Time (TBUT)
- Schirmer's Test (SCH),
- Tear Clearance (TCL),
- Oxford Staining Score (OXF) and
- Van Bijsterveld Lissamine Green Staining (LGS).

Variables were determined preoperatively and 3, 6 and 12 months after CXL.

Comparison of results after treatment with basal values

- All the studied variables remained stable after one year's follow-up.
- Not significant differences were found related to the basal situation (Mann-Whitney's U test).

Variables	Basal	3 month	p value	6 month	p value	1 year	p value	Outcome
OSM	302.46 ± 9.4	304.55 ± 11.02	0.344	301.91 ± 13.5	0.808	300.90 ± 13.09	0.676	Stable
OSDI	28.29 ± 22.77	17.63 ± 14.8	0.083	12.80 ± 20.94	0.086	17.07 ± 21.35	0.513	Improvement
TBUT	12.50 ± 4.16	13.96 ± 3.35	0.2	13.68 ± 3.35	0.303	14.45 ± 3.85	0.139	Improvement
SCH	16.58 ± 8.51	19.26 ± 8.57	0.063	18.95 ± 7.55	0.113	17.05 ± 7.42	0.863	Improvement
TCR	4.46 ± 1.72	4.35 ± 1.33	0.909	4.57 ± 1.16	0.947	3.63 ± 1.21	0.13	Deterioration
FLUO	0.33 ± 0.56	0.48 ± 0.655	0.454	0.55 ± 0.74	0.19	0.52 ± 0.81	0.166	Deterioration
LGS	1.22 ± 1.45	1.64 ± 1.86	0.581	1.45 ± 1.7	0.949	1.50 ± 1.6	0.131	Deterioration

Osmolarity (mOsm/L), Ocular Surface Disease Index, Tear Break-Up time (seconds), Schirmer's Test (mm), Tear Clearance Test, Fluorescein staining (Oxford staining score), Lissamine Green staining (van Bijsterveld scheme).

P < 0.05 Statistically significant differences.

Correlations between parameters (Spearman's test)

There was a positive paired correlation between SCH and TCL at 3 (P<0.01), 6 (P=0.04) and 12 months (P<0.01), SCH and LFI at 3 (P<0.01), 6 (P=0.01) and 12 months (P=0.01), and between TCL and LFI at 3 (P<0.01) and 12 months (P=0.02). There was no correlation between the SCH score and BUT apart from a positive correlation at 12 months (P=0.05). A negative correlation was found between OSM and SCH at 3 (P<0.01) and 12 months (P=0.04). OSDI did not correlate with any of the studied variables.

Spearman's rho Coefficient			
Variables	3 month	6 month	12 month
SCH/TCR	0.532	0.434	0.675
	p<0.01	p=0.04	p<0.01
LSG/FLUO	0.598	0.842	
	p=0.03	p<0.001	
SCH/TBUT			0.601
			p=0.05
OSM/SCH	-0.589		-0.049
	p<0.01		p=0.04

SCH: Schirmer's test; TCR: Tear clearance; LSG: Lissamine green staining; FLUO: Fluorescein staining; TBUT: Tear break-up time; OSM: Osmolarity
P<0.05 Statistically significant differences

Conclusion

- Corneal collagen cross-linking, at least during the first postoperative year, doesn't modify the parameters currently used to evaluate the tear film function.
- There is no correlation between objective and subjective parameters in the analysis of tear film function.

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