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Introduction:

Contact lens wear has an impact on the composition of the tear film. Therefore, it is considered in the literature as a risk factor for Dry Eye. [1] The Dry Eye is currently one of the most common eye diseases. [2] Beside increased osmolarity of the tear film, Dry Eye can result in an inflammation of the ocular surface and can be associated with an increased concentration of matrix-metalloproteinase-9 (MMP-9) in the tear film. [1] MMP-9 is a nonspecific inflammatory marker [3], which inhibits wound healing [4], breaks tight junctions [1] and can disrupt barrier function. [5]

Purpose:

The aim of this study was to detect the pro inflammatory enzyme MMP-9 in the tear film of wearers of adapted soft contact lenses (SCL) and rigid contact lenses (RGP). Furthermore, differences between these wearer groups regarding MMP-9 and other symptoms of Dry Eye were compared.

Materials & Methods:

- Prospective, age and gender matched study design (Mean Age 31,45 years, Gender distribution Female: 50,7 % / Male: 49,3 %)
- 30 SCL and 30 RGP lens wearers were enrolled

Process of the study:

- ICF was obtained
- Biomicroscopy of anterior segment of the eye
- Measurement of the presence of MMP-9 in tear film using INFLAMMADRY® (Quidel Corporation)
- Subjective Dry Eye Questionnaire (MCMONNIES) and questionnaire about wearing behavior of contact lenses and lifestyle of the subjects



Figure 1: Sampling with a MMP-9 Test [6]

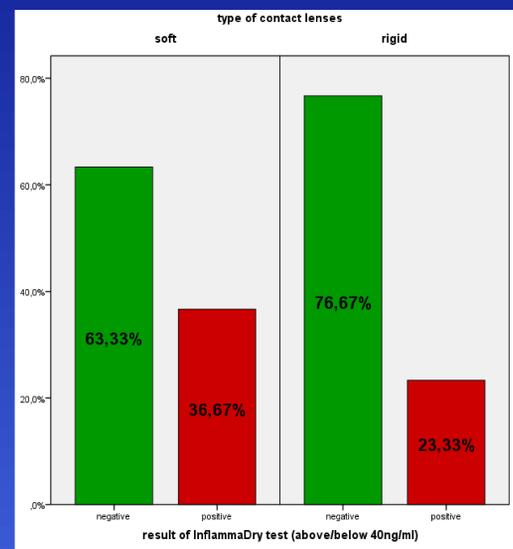


Figure 2: Proportion of MMP-9 test results relative to the type of contact lenses

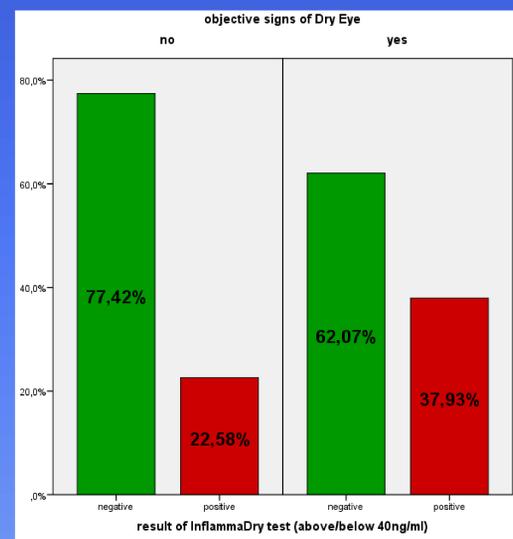


Figure 3: Proportion of MMP-9 test results relative to the presence of objective signs

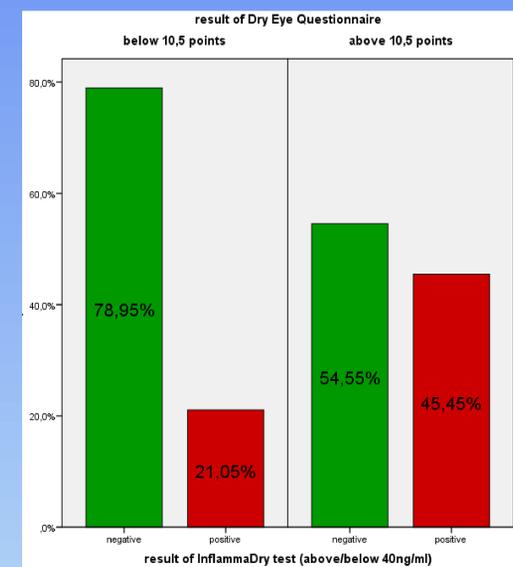


Figure 4: Proportion of MMP-9 test results relative to the result of Dry Eye Questionnaire

Results:

- MMP-9 test result were positive in 30% of all subjects.
- Wearers of SCL were more vulnerable to a positive test result and had a higher probability of an increased MMP-9 concentration in the tear film compared to wearers of RGP lenses (Figure 2).
- 22.6% of subjects without and 37.9% with existing objective signs were more vulnerable for a positive result of MMP-9 test. Wearers of SCL had an approximately 1.6-times increased risk to suffer on signs of Dry Eye (Fig. 3).
- 38 subjects had less than 10,5 points (McMonnies). 79.0% of these subjects had a negative MMP-9 test result (Fig.4).

Conclusion:

Based on the investigated data, no clear correlation was detected between MMP-9 and contact lens induced Dry Eye. Consequently, contact lenses do not represent a sole risk factor for the development of a Dry Eye due to an increased presence of MMP-9.

Furthermore, there were no statistically significant differences between SCL wearers and RGP wearers regarding their MMP-9 findings. Therefore, wearers of SCL are not disadvantaged in the presence of inflammatory markers compared to wearers of RGP. However, SCL wearers are more vulnerable for infiltrates than RGP lens wearers.

Furthermore, subjects with at least one positive objective sign have an increased chance for a positive MMP-9 test result, too.

However, wearers of SCL in contrast to wearers of RGP lenses have an increased risk to develop a higher concentration of MMP-9.

References:

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