N-Acetyl-Carnosine, a natural histidine containing dipeptide, as a potent ophthalmic drug in treatment of human cataracts.


Purpose

A study was designed to document and quantify the changes in lens clarity over 6 and 24 months in 2 groups of 49 volunteers (76 eyes) with an average age of 65.3 +/- 7.0 enrolled at the time of diagnosis of senile cataracts of minimal to advanced opacification.

Method

The patients received:

1) Placebo composition (13 patients, 21 eyes) topically (two drops, twice daily) to the conjunctival sac – Group I
2) No treatment (10 patients, 14 eyes) – Group I
3) N-acetyl-Carnosine, 1% sol (NAC) (26 patients, 41 eyes) - Group II

The placebo and untreated groups were combined into the control (reference) Group I.

Patients were evaluated upon entry, at 2-month (Trial 1) and 6-month (Trial 2)-intervals for best corrected visual acuity (b/c VA), by ophthalmoscopy and the original techniques of glare test (for Trial 1), stereo cinematographic slit-image and retro-illumination photography with subsequent scanning of the lens.

Results

The computerized interactive digital analysis of obtained images displayed the light scattering/absorbing centers of the lens into 2-D and 3-D scales. The intra-reader reproducibility of measuring techniques for cataractous changes was good, with the overall average of correlation coefficients for the image analytical data 0.830 and the glare test readings 0.998.
Compared with the baseline examination, over 6 months 41.5% of the eyes treated with NAC presented a significant improvement of the gross transmissivity degree of lenses computed from the images, 90.0% of the eyes showed a gradual improvement in b/c VA to 7-100% and 88.9% of the eyes ranged a 27-100% improvement in glare sensitivity.

Topographic studies demonstrated less density and corresponding areas of opacification in posterior subcapsular and cortical morphological regions of the lens consistent with VA up to 0.3. The total study period over 24 months revealed that the beneficial effect of NAC is sustainable.

No cases resulted in a worsening of VA and image analytical readings of lenses in the NAC-treated group of patients. In most of the patients drug tolerance was good.

Group I of patients demonstrated the variability in the densitometric readings of the lens clouding, negative advance in glare sensitivity over 6 months and gradual deterioration of VA and gross transmissivity of lenses over 24 months compared with the baseline and 6-month follow-up examinations.

Statistical analysis revealed the significant differences over 6 and 24 months in cumulative positive changes of overall characteristics of cataracts in the NAC-treated Group II from the control Group I.

**Conclusion**

The N-acetylated form of natural dipeptide L-Carnosine appears to be suitable and physiologically acceptable for non-surgical treatment for senile cataracts.