Retinal bioavailability of curcumin after oral administration

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Curcumin (1,7-bis(4-hydroxy-3-methoxyphenyl)-1,6-heptadiene-3,5-dione) is an active ingredient extracted from the root of Curcuma longa and showed anti-inflammatory and antioxidant properties, to be exploited for treatment of diabetes and also diabetic retinopathy (1). Although curcumin is widely available in the market as nutritional supplements claiming visual function protection, the bioavailability in retinal tissue, after oral administration, has never been investigated. The aim of the study was to assess retinal PK profile of three commercial products after oral administration in rabbit. The commercial products used in the present study are water soluble curcumin formulation (CHC); curcumin-phosphatidylcholine complex (CP); curcumin + piperine product (CTR). Albino rabbits received curcumin formulations by oral gavage and sacrificed at 2h, 6 h, 12 h and 24 h to collect the retina. Retinal levels of curcumin were evaluated by LC/MS-MS [LLOQ=0.0007 ng/mg]. Data generated from the three experimental groups demonstrated that only CHC-treated group showed retinal levels of curcumin after oral administration (Cmax=0.036 ± 0.002 ng/mg Tmax= 6 h and AUC= 15.48 ng*min/mg of retina). Retina curcumin levels after oral administration of CP and CTR were below the LLOQ. CHC formulation showed higher plasma bioavailability after oral administration compared to CP and CTR (Jäger et al. Nutrition Journal 2014, 13:11). Furthermore, our data seem to indicate that CHC formulation provides relevant curcumin levels in rabbit retina after single oral administration suggesting that this formulation may be of value in clinical practice to manage retinal conditions.

References

1 Jiménez-Osorio et al. Clin Chim Acta. 2015

2 Jäger et al. Nutrition Journal 2014