

# “ORAL PHARMACEUTICAL TREATMENT FOR AMBLYOPIA IN OLDER PATIENTS”

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## **SUMMARY:**

Conventional treatment for amblyopia of all etiologies relies upon early (by age 3-5) detection and vigilant compliance for maximal effectiveness. If not diagnosed by age 8-9, the prognosis for significant, permanent rehabilitation of visual acuity and binocular function is diminished.

However, one little known approach to the treatment of older amblyopic individuals has been shown to increase therapy success.

The off-label use of the oral pharmaceutical agent levodopa/cabidopa (Sinemet: Merck&co.) Has been shown in several studies to improve visual acuity, on average, in the amblyopic eye by 2 lines, and ½ line in the dominant eye. Measurable improvement in other visual functions – contrast sensitivity, binocular fusion –has also been reported.

## **CLINICAL PHARMACOLOGY**

Levodopa/carbidopa (L/C) was originally developed to restore physiologic levels of dopamine in the CNS of patients with Parkinson's Disease. The levodopa crosses the blood-brain barrier and is converted to dopamine. Carbidopa acts in the peripheral vascular system, blocking levodopa's conversion to dopamine and thus increasing the amount of serum levodopa available for diffusion into the CNS.

It has been well established that dopamine is a retinal neurotransmitter and neuromodulator. Studies over the last ten years have established the rationale, safety, and efficacy of using L/C to restore visual function in otherwise resistant cases of amblyopia.

L/C is administered at the rate of .55mg/kg of body weight, t.i.d. with meals for a period of seven weeks, combined with at least 3 hours/day of direct occlusion of the dominant eye.

Possible side effects include fatigue, headaches, mood changes, sleeping problems, and nausea; most patients experience only mild symptoms which subside within the first two weeks of therapy.

L/C treatment is contraindicated in sexually active females of child-bearing age due to its teratogenicity.

All results to date indicate permanent (to at least 6 months) improvement in visual function, although long-term followup studies have not been done.

At the recommended dosing levels, there have been no systematic changes in standard laboratory tests (chem 20, CBC) or physiological vital signs between baseline and treatment conclusion 7 weeks later.

## **RESEARCH SUMMARY**

See Table 1, page 3

## **CASE PRESENTATION**

T.M., a 45 year old anisometric amblyope, presented in January 1998 for a routine eye examination. Best corrected acuities were O.D. 20/200+ with +6.00D and 20/20 O.S. with +1.50D. There was no pathology present. Patching therapy had never been attempted as a child.

T.M. elected to begin levodopa / carbidopa therapy May 1998, at which time his baseline visual acuities were unchanged from January. He was administered Sinemet (Merck & Co.) at a dosage of .55 mg/kg body weight t.i.d. with meals for a seven-week period, combined with 3-4 hours/day occlusion of his left eye.

Visual acuity in his amblyopic eye had improved to 20/80 by the 1-month followup exam; At the 2-month exam his BVA was 20/60 -. His visual acuity remained at this level at both the 1-month and 6-month post-treatment followup examinations.

T.M.'s subjective response to therapy was impressive: he volunteered how his near vision OD had noticeably improved for the first time in his life. He also felt much more aware of depth and reported a heightened sense of general spatial awareness. Though difficult if not impossible to quantify, such voluntary comments are quite persuasive when assessing the value of this unique approach to visual rehabilitation in amblyopia.