Lifestyle & Nutrition Considerations in Glaucoma Management

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I. Lifestyle Factors that modify IOP:

A. Activities that increase IOP

1. Playing brass & wind instruments
   a. High resistance vs low resistance
   1. High resistance had small but significantly greater incidence of VF loss vs low resistance
   2. Cumulative effects of long term intermittent IOP elevation while playing may result in glaucomatous damage that could be misdiagnosed as NTG

2. Drinking coffee
   a. 1-4 mm Hg. increase in IOP
   b. Lasts ~ 90 min

3. Certain yoga positions
   a. Heart above eye positions can double IOP

4. Wearing a tight necktie
   a. Modest IOP increase (~2mm Hg.)

5. Lifting weights
   a. Modest & transient IOP increase (~4 mm Hg. or 22% increase above baseline)
   b. Followed by nominal IOP decrease of ~ 1 mm Hg. after completion of exercise

6. Alcohol ingestion
   a. Studies are inconclusive with some suggesting a decrease while others suggest an increase

B. Activities that lower IOP

1. Most exercise can modestly lower IOP if sustained

C. Miscellaneous lifestyle factors:

1. Cigarette smoking
   a. Highly associated with carcinogen exposure
   b. Highly linked to ocular conditions
      1. Cataracts
      2. Age-related macular degeneration
   c. No strong evidence that IOP increases with smoking
   d. Cigarette smoking does not increase the risk for POAG
2. Post-menopausal hormone (PMH) use
   a. Evidence that estrogen & estrogen analogs protect retinal ganglion cells from apoptosis
   b. Several studies report that PMH use is associated with lower IOP & enhanced blood flow to the ONH
3. Body Mass Index (BMI)
   a. Few studies have directly studied the relation between BMI & IOP
   b. Some studies show a + relationship between BMI & IOP

II. AREDS in Macular degeneration:
   A. AREDS 1 vs AREDS 2

III. Diet & Nutrition affects in glaucoma:
   A. Antioxidants
      1. AREDS 1&2 formulas: No significant relationship in glaucoma has been found between the use of AREDS 1 or 2 vitamin sets
         a. Vitamin A
         b. Vitamins C
         c. Vitamin E
         d. Carotenoids (Lutein & Zeaxanthin)
      2. Colored fruits & vegetables
         a. Resveratrol
            1. Known for role in extending life (fruit fly research!)
            2. Lab evidence of neuroprotection from toxic effects of inflammation
         b. Quercetin
            1. Lab evidence of antioxidant, anti-inflammatory and neuroprotective properties
      3. Melatonin
         a. Naturally produced hormone with a number of functions but best known for regulating sleep
         b. 10 mg has been shown to lower IOP
            1. Appears to act on the Alpha & Beta adrenergic receptors as well as carbonic anhydrase
         c. Neuroprotection effect may be enhanced when used with Resveratrol
   B. Essential fatty acids
      1. Omega-3 (Ω-3)
         a. Animal studies suggest high Ω-3 intake is associated with lower IOP
         b. It is unclear what dietary recommendations should be made for overall ocular health
            1. Experts suggest a ratio of between 1:1 to 4:1 of Ω-6 fatty acids (olive, soybean or sunflower oil) to Ω-3 fatty acids (fish oil) is ideal
IV. Vascular Dysregulation
   A. POAG vs NTG
   B. Gingko Biloba
   C. Calcium Channel Blockage
      1. Magnesium

V. The “Other” supplements
   A. Vitamin B-complex (water soluble)
      1. In combination with E and Ω-3 (DHA), shown to stabilize VF
   B. Vitamin D (Fat soluble)
      1. Early ’14 study supported association of Vitamin D deficiency with presence of glaucoma
      2. No supplementation needed but may want to test for deficiency in NTG
   C. Blood flow enhancers
      1. Mirtrogenol® (120 mg b.i.d.)
         a. Commercial composition of Bilberry extract (Mirtoselect®) and French maritime pine bark (Pycnogenol®)
      2. Gingko biloba (80 mg b.i.d.)
         a. Also works as an antioxidant
         b. Decrease production of cellular byproducts that induce inflammation
         c. Decrease blood viscosity
         d. Increases circulation
         e. Prevents endothelin production

VI. Non-traditional approaches to management of glaucoma:
   A. Acupuncture
      1. Animal study evidence of reduced IOP but nothing in human IOP or visual fields
   B. Cannabis
      1. Duration of action and variability of delivery concentration makes unreliable
      2. There are far better management regimens now available
      3. 3-4 hr efficacy ≠ good control
      4. Constant intoxication ≠ good citizens
      5. Health concerns ≠ future safety profile
      6. Marijuana is still Schedule 1
   C. Endocannabinoids
      1. Endogenous cannabinoid receptors located in the mammalian brain
      2. Involved in a variety of physiological processes
VII. Glaucoma Supplements:
   A. Recommendations are based on the individual patient & their specific health history
   B. Recommendations to initiate
      1. Consider what should be avoided
         a. Blood thinners
         b. Hormone sensitive cancers or conditions
      2. Consider what is affordable
      3. Consider the glaucoma type
         a. NTG in those NOT taking blood thinners
      4. Consider how each supplement will interact with other health conditions and medications
         a. Difficulty sleeping
         b. Low serum Vitamin D levels
         c. Poorly controlled diabetes
         d. Poorly controlled systemic hypertension
         e. Add one supplement at a time
         f. Give each supplement a chance to work
         g. Include their physician in their supplement treatment
   C. Recommendations to discontinue (prior to surgery)
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