**The Effect of Spectral Filter Eyeglass Lenses on Adults with ADD and Irlen Syndrome: Does This Intervention Change the Attentiveness Profile?**

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**Abstract**

Irlen Syndrome (IS), difficulty in visual processing, shares symptoms with Attention Deficit Disorder (ADD). The study asks whether the use of spectral filter (SF) eyeglass lenses improves individuals’ attentiveness profile.

Methods: 39 adults aged 18–50, diagnosed with ADD and IS, are fitted with SF (the R[esearch] group) and two groups are not fitted (control groups). Two research tools are used: an auxiliary tool for ADD diagnosis—MOXO-CPT(D)—and an attention-deficit questionnaire from DSM-5.

Results: SF induced significant improvement in the attentiveness index of the R group relative to that of the control groups. In the short term, 50% of the R group changed their attentiveness profile and converged into the neuronormative range; in the long term, 71% did so. Pursuant to SF use, 50% of those examined (R) improved continuous attentiveness and did not show fatigue, as against all members of the control groups.

Conclusions: The perceptible improvement in the attentiveness index and the change of attentiveness profile among at least 50% of persons examined suggests the possibility of false ADD diagnosis due to the comorbidity of IS and ADD and indicates that differential diagnosis is needed.

**Keywords:** Attention Deficit Disorder, Irlen Syndrome, spectral-filter lenses, differential diagnosis, reading difficulties, fatigue, continuous attentiveness, comorbidity, specific learning disorders

Introduction

In our years of experience in research, diagnosis, and treatment of people with Irlen Syndrome (IS), we have encountered many who have additional disorders, such as specific learning disorders in reading and Attention Deficit Disorder (ADD). After many such people were diagnosed with IS and fitted with spectral filter (SF) lenses, they sensed an enormous improvement in attentiveness along with improvement in reading and depth perception and a decline in headaches and fatigue. Their testimonies prompted us to investigate these two syndromes in an attempt to understand their comorbidity and determine whether differential diagnosis of IS and ADD can be found.

ADD, a widely encountered disorder caused by faulty brain functioning, leads to attentiveness difficulties, impulsivity, and hyperactivity. It is common among adults and its symptoms manifest differently with age (Fletcher, 2014). The symptoms appear largely up to age twelve. Some believe that 2.5% of all adults have been diagnosed with ADD (Kolodny, Ashkenazi, Farhi Shalev, 2017; Simon, Czobor, Balint, Meszaros & Bitter, 2009; Vitola et al., 2017; López-Pinar et al., 2020). The rate of ADD among adults has been rising over the years (Barkley, Fischer, Smallish & Fletcher, 2006).

In many studies that seek to understand the determinants of ADD, brain scans identify the frontal cortex as the main area of impairment that causes ADD (Dickstein et al., 2006). Studies by means of FMRI in recent years, however, have yielded findings attesting to impairment in additional areas of the brain. The most recent studies relate to the neural network that connects the various zones (Hale et al., 2017 and focus less on specific areas of the brain. A path-breaking meta-analytical study (Cortese et al., 2012) that examined FMRI-facilitated ADD studies identified the visual variable as a meaningful element in ADD.

ADD diagnosis, particularly among adults, is difficult due to comorbidity of this disorder and other disorders and phenomena. ADD displays high comorbidity with learning disorders (DSM-5; American Psychiatric Association [APA], 2013) and other psychiatric disorders (Horning, 1998; Weiss & Hechtman, 1993, p. 408, in Schoechlin & Engel, 2005). In 50%–60% of adult ADD cases, clinical and psychosocial difficulties are encountered (Knecht et al., 2015; London & Landes, 2016; Young & Goodman, 2016).

Apart from what we know about ADD comorbidity with other illnesses, there is evidence that attention-deficit disorders may be accompanied by secondary effects such as risk-taking, anxiety, psychological disorders, extreme moods, and various states of depression (Schoechlin & Engel, 2005). The complexity of identifying ADD symptoms relative to other illnesses makes it harder to apply differential diagnosis to adults than to children because the symptoms in adults are less obvious and focused. Symptoms are masked by many phenomena (Quintero, Morales, Vera, Zuluaga & Fernández, 2019). Another complicating factor in diagnosis is that the adult evaluation questeoninaire is based solely on self-reportage, whereas in diagnosing children additional rapporteurs such as teacher, parent, and friends fill in the questionnaire. The importance of differential diagnosis of ADD in adults has implications not only for the quality of life of those affected but in weighty social and economic contexts (Knecht et al., 2015; London & Landes, 2016; Young & Goodman, 2016)/