

## Research Article

# ANALYSIS OF ELECTROPHOTONIC PARAMETERS OF ADHD CHILDREN

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## Abstract

**The aim of the study:** Determining difference in electrophotonic parameters of ADHD and healthy children.

**Subjects:** 44 children (40 boys and four girls), age 13+5 years, diagnosed with ADHD and treated the Clinic of Integrative Medicine (Bangalore, India) by Dr. Rajeev Peshawar. EPI parameters of ADHD children were compared with EPI parameters of 44 healthy children of similar age.

**Results:** The following electrophotonic parameters were calculated in Bio-Well programs: Energy, Stress coefficient, and Inner noise coefficient had statistically significant differences between ADHD and healthy children ( $p < 0.001$ ). The data analysis demonstrated that for ADHD children, Energy and Inner Noise parameters are higher than for healthy children. These parameters are related to the level of metabolism and increase in the case of inflammation. This correlates with the results of recent studies which have identified ADHD as an inflammatory condition associated with immunological and oxidative response. At the same time, the Stress coefficient is lower for ADHD children, which may be interpreted as evidence of a lower level of psychic activity related to lower conduction of nerve processes for ADHD children than healthy ones. This manifests in communication difficulties, difficulties with assimilation of information, and slow psycho-motor reactions. This is related to the Inattentive Type of ADHD and confirms the data that this type is associated with the low development of the frontal cortex area of the brain. **Conclusion:** This pilot study demonstrates a promising way of analyzing ADHD children by electrophotonic parameters. Further work is needed to understand the biophysical principles of these results. *ASEAN Journal of Psychiatry, Vol. S1(1): March-April 2022: 01- 03.*

**Keywords:** ADHD Children, Electrophotonic Parameters, Bioenergy, Stress, Metabolism.

## Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopment disorder characterized by inattention, hyperactivity, and impulsivity, which are pervasive, impairing, and otherwise age-inappropriate [1-3]. Some individuals with ADHD also display difficulty regulating emotions or problems with executive function. For a diagnosis, the symptoms have to be present for more than six months and cause problems in at least two settings (school, home, work, or recreational activities). Additionally, it is associated with intellectual disabilities. Although it causes impairment, particularly in modern society, many people with ADHD have sustained attention for tasks they find interesting or rewarding, known as hyperfocus. The precise cause or causes are unknown in the majority of cases. Genetic factors are estimated to make up about 75% of the risk. Toxins and infections during pregnancy and brain damage may be environmental risks. It does not appear to be related to parenting style or discipline [4]. Based on the criteria published in 2013 [1,5], there are three presentations of ADHD:

- ADHD, predominantly inattentive type, presents with symptoms including being easily distracted, forgetful, daydreaming, disorganization, poor concentration, and difficulty completing tasks.
- ADHD, predominantly hyperactive-impulsive type, presents with excessive fidgeting and restlessness, hyperactivity, and difficulty waiting and remaining seated.
- ADHD, combined type, is a combination of the first two presentations.

To be considered, several symptoms must have appeared by the age of six to twelve and occurred in more than one environment (e.g., at home and school or work). The symptoms must be inappropriate for a child of that age, and there must be clear evidence that they are causing social, school, or work-related problems.

In this paper, we present the results of the electrophotonic analysis of children with ADHA compared with healthy children.

## **Mental Health**

### *Electrophotonic imaging technique*

Computer techniques based on image analysis are widely used in medicine, from X-rays to different types of tomography analysis. A promising method already utilized in sixty-two countries to great success is Electrophotonic Image (EPI) analysis, based on the Kirlian effect. This effect occurs when an object is placed on a glass plate and stimulated with a strong electromagnetic field; a visible glow occurs due to the gas discharge. With EPI/GDV cameras (electro-photon imaging through gaseous discharge visualization), the Kirlian effect is quantifiable and reproducible for scientific research purposes. Images captured of all ten fingers on each human subject provide detailed information on the person's psychosomatic and physiological state [6,7]. Through investigating the fluorescent fingertip images, which dynamically change with emotional and health conditions, one can identify areas of congestion or health in the whole system. The image parameters generated from photographing the finger surface under electrical stimulation create a neurovascular reaction of the skin, influenced by the nervous-humoral status of all organs and systems. In addition, most healthy people's EPI/GDV readings vary only 8%-10% over many years of measurements, indicating a high level of precision in this technique. The EPI/GDV camera systems and their accompanying software are widely used in research and practice [8-14]. Promising results were presented in EPI/GDV analysis of autistic children [15,16].

Images were processed in specialized software [17], and statistical analysis was performed using ANOVA and Excel programs.

### **Subjects**

Forty-four children (40 boys and four girls), age 13+5 years diagnosed with ADHD and having treatment in the Clinic of Integrative Medicine (Bangalore, India) by Dr. Rajeev Peshawar were analyzed with EPI/GDV technique. EPI parameters of ADHD children were compared with EPI parameters of 44 healthy children of similar age. All parents of the participants were explained about the nature of the study and were given basic information about the EPI technique and the procedure for assessment. The parents of all the children signed a consensus form. The protocol of the study was approved by the ethics committee of the Federal State Budget Institution "Saint-Petersburg Scientific-Research Institute for Physical Culture," St. Petersburg, Russia.

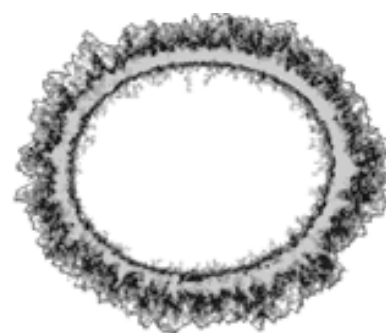
### **Result**

The EPI image of a finger glow of an apparently healthy person looks like a halo around the fingertip (Figure 1). It may have some irregularities of a contour (Figure 2) or brakes (Figure 3), which are usually related to some health issues [6,7].

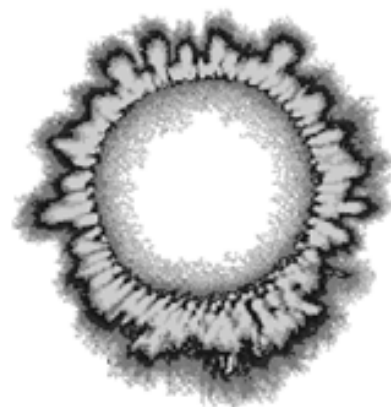
EPI images of ADHD children may be of two types: with highly uneven contour and some outside sparks (Figure 4) or with noise inside the contour of a fingertip (Figure 5). Different fingers of both hands may be of one of these types or both.

To define the difference between EPI images of ADHD and healthy children, the following parameters were calculated in Bio-Well programs [6,18]:

- Energy,
- Stress coefficient
- Inner noise coefficient



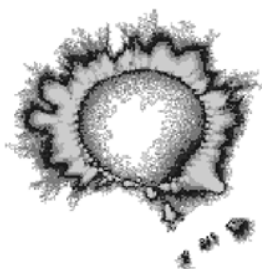
**Figure 1: EPI image of a finger glow of an apparently healthy person.**



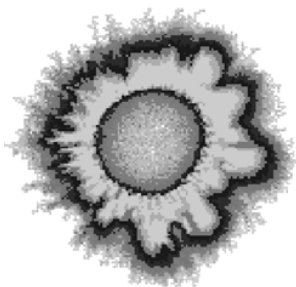
**Figure 2: EPI image of a finger glow of an apparently healthy person.**



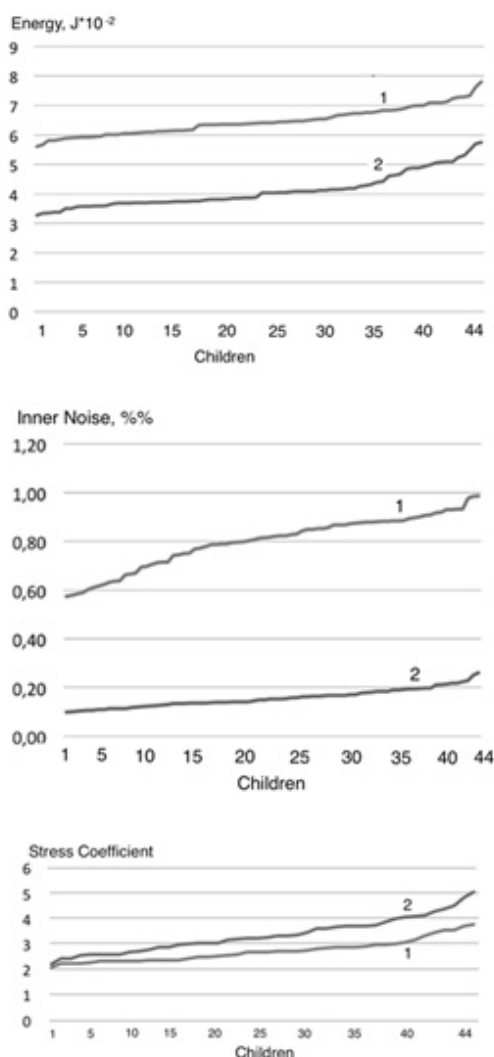
**Figure 3: EPI image of a finger glow of a person with health problems.**



**Figure 4: EPI image of a finger glow of a child with ADHD.**



**Figure 5: EPI image of a finger glow of a child with ADHD.**



**Figure 6: EPI parameters for 44 children with ADHD (curves 1) and 44 healthy children (curves 2).**

All these parameters had statistically significant differences between ADHD and healthy children ( $p < 0.001$ ). Results are presented in Figure 6.

## Discussion

The following electrophotonic parameters were calculated in Bio-Well programs: Energy, Stress coefficient, and Inner noise coefficient had statistically significant differences between ADHD and healthy children ( $p < 0.001$ ). The data analysis demonstrated that for ADHD children, Energy and Inner Noise parameters are higher than for healthy children. These parameters are related to the level of metabolism and increase in the case of inflammation [6,7]. This correlates with the results of recent studies which have identified ADHD as an inflammatory condition associated with immunological and oxidative response [19]. At the same time, the Stress coefficient is lower for ADHD children, which may be interpreted as evidence of a lower level of psychic activity related to lower conduction of nerve processes for ADHD children than healthy ones. This manifests in communication difficulties, difficulties with assimilation of information, and slow psycho-motor reactions. This is related to the Inattentive Type of ADHD and confirms the data that this type is associated with the low development of the frontal cortex area of the brain.

## Conclusion

This pilot study demonstrates a promising way of analyzing ADHD children by electrophotonic parameters. Further work is needed to understand the biophysical principles of these results.

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