

The Successful Treatment of Dysarthria Using Strannik Light Therapy (Biofeedback): A Case Study

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Abstract

This article reports a case of dysarthria which was successfully treated by Strannik Light Therapy (SLT). It briefly discusses the known etiology for the condition and illustrates that dysarthria must be a problem of autonomic dysfunction in which pathological changes can influence the structure and/or subsequent function of the dynamic interplay between the brain and the organs involving the autonomic nervous system and physiological systems. The author reports a particular case in which a patient undertaking SLT fully recovered the ability to speak within 6 days.

Keywords

Dysarthria, Dysautonomia, Autonomic Dysfunction, Physiological Systems, Strannik Virtual Scanning (SVS), Strannik Light Therapy (SLT)

1. Introduction

Dysarthria can have multiple origins *i.e.* 1) it can be due to autonomic dysfunction *e.g.* due to the side-effects of alcohol or drug medications; and/or 2) it can be the consequence of neuro-degeneration or injury *e.g.* of brain tumour or injury, stroke, the onset of dementia, or the side-effects of neuromuscular disease *e.g.* parkinsonism, multiple sclerosis, muscular dystrophy, etc. A person with dysarthria has difficulty controlling and co-ordinating the function of muscle groups which produce speech. Such observations indicate that dysfunction of the autonomic nervous system may play a significant role in the etiology of dysarthria.

2. The Autonomic Nervous System

There is not yet an understanding of the relationship between visual input and cellular & molecular biology [1].

There are a number of basic observations or relationships which help to evaluate this relationship e.g.

- 1) Light influences the autonomic nervous system.
- 2) Light conveys an estimated 85% of sensory information which, in the extreme, includes the influence of stress and its pathological manifestations *i.e.* stress alters cell morphology and influences the function of the visceral and sensory organs.
- 3) The visceral organs are components in organ networks *i.e.* physiological systems.
- 4) In addition, what we know of the brain's "executive functions" considered to be regulated by the prefrontal cortex bears a similarity to the physiological systems *i.e.* the brain regulates the body's functions and systems.

System function and molecular biology are in a dynamic relationship in which changes at the systemic level (induced by sensory input) influence molecular biology and changes at the molecular level (induced by environmental influences) influence systemic stability [2] *i.e.* metabolites influence brain function. Most drugs, many medical conditions and diseases influence colour perception. They influence protein expression and/or function. There is an association with 1) the autonomic nervous system, 2) the co-ordinated function of organs in the organ networks (*i.e.* the physiological systems) and 3) changes at the molecular level *i.e.* to genotype and phenotype [2].

For example:

- The function of immunosuppressive drugs is often influenced by strong sunlight.
- Steroids increase the sensitivity of the skin to sunlight and are associated with cataract formation.
- Sunlight influences levels of nitric oxide (NO) which is involved in cardiovascular function [3].
- Sunlight influences the expression of the steroid hormone calcitriol (vitamin D) [4].
- Unexplained changes to the autonomic nervous system are often known as dysautonomia.
- Daylight stimulates the production of serotonin whilst the onset of night hours stimulates the production of the potent antioxidant and free radical scavenger Melatonin.
- Type 1 diabetes is a problem of protein expression (*i.e.* of pro-insulin) whilst type 2 diabetes is a problem of protein reactivity (*i.e.* of insulin resistance) [2] [5] *i.e.* of genotype and phenotype.

Each network of organs functions in a coordinated manner however there is not yet an accepted understanding of the neural and/or nervous system mechanisms which regulate system stability and there is not yet an accepted understanding of the mechanisms which regulate the coordinated function of all physiological systems. Knowledge of this relationship and in particular of the physiological systems may have diagnostic and therapeutic significance [6].

Physiological Systems

There is a structural relationship between sense perception, the autonomic nervous system and physiological systems [2], which is manifest at the cellular & molecular level. Many medical articles discuss aspects of this fundamental relationship however, in view of the enormous complexity of the issues faced, medical research is specialised into different scientific disciplines *i.e.* it studies individual aspects of the body's function independently of the whole. Such understanding—of the autonomic nervous system—presents an opportunity to study the body's whole function using systems biology and mathematical modelling. Precedents for such approach are already evident in healthcare. For example MRI, Ultrasound and CAT scanners are based upon the body's interaction with electromagnetic radiation. Complex algorithms are used to interpret the data.

Light-based biofeedback techniques have been researched for almost 100 years. They have been used with some success in the treatment of migraine [7] [8] dyslexia [9] [10], sleep apnoea [11], and a wide range of ailments. Nevertheless such therapies are experiential and are considered to be unreliable, controversial and unfashionable. A greater understanding of the mechanisms can lead to improved therapeutic outcomes. For example flashing lights can induce photosensitivity e.g. of migraine, but appropriately selected coloured light and flicker frequencies can also be used with therapeutic effect to treat migraine [12] [13].

Light comprises a spectrum of electromagnetic radiation in the visible region which has biological significance *i.e.* it is essential for the body's continued function [14]. SLT is based upon the above structural relationship between visual perception, the autonomic nervous system and physiological systems *i.e.* that knowledge of a patient's health and hence of their systemic parameters can be used to re-establish the coherent function of groups of organs *i.e.* of specific physiological systems.

3. Case Study

Patient: male circa 72 years, dysarthria.

Symptoms: condition had persisted for 5 years; symptoms of severely slurred speech, unintelligible to an unfamiliar person, unable to articulate clearly. Reading, writing and thought processes were completely normal. No history of psychiatric problems, previous drug use or anything other than the inability to speak.

Virtual scanning indications: A Strannik Virtual Scanning (SVS) test identified encephalopathy, impairment of cerebral circulation and other minor indications.

Medical testing and treatments: testing indicated that the patient had not suffered a stroke (or if so, a minor stroke below current detection limits of the available test equipment). Extensive testing at Nottingham's Queens Medical Centre could not identify the cause of the problem. Over a 5-year period the patient was tested for motor-neurone disease, parkinsonism, etc.; using MRI and other techniques but nothing significant was detected or was able to remedy the situation. The patient was notified by his consultant that nothing more could be done to assist him. Finally the patient tried various types of complementary and alternative medical techniques but without any success.

Virtual scanning treatment: patient was offered SLT which he undertook for a period of 15 - 20 minutes each day. He completely recovered the ability to speak and communicate clearly in 6 days.

4. Discussion

This case study illustrates that dysarthria was not due to any specific physiological cause *i.e.* of damage or altered biochemistry. That the patient had tried every else over a 5-year period and then completely recovered their speech indicates the value and significance of SLT. It illustrates that dysarthria was not due to any specific physiological cause but instead was the consequence of the brain and muscle groups being unable to work together in a coherent or co-ordinated manner and, furthermore that SLT was able to completely resolve this apparent lack of brain to organ coordination.

The concept of brainwave coherence is not new to the medical sciences. Electrical currents in brain implants are used to reduce the extent of neuromuscular tremours in Parkinson's disease. Biofeedback using light has been researched since the 1930's. Neurofeedback through electrodes attached to the brain have been widely researched although the current body of evidence is considered anecdotal *i.e.* the technology works sometimes but is unreliable. There are occasional reports that the technique has been deployed with therapeutic effect to treat a wide range of ailments however the observations upon which neurofeedback is based are not yet based upon a fundamental understanding of a scientific principle. The influence of the nervous system upon health, in particular of the autonomic nervous system, has been widely studied by Russian researchers [15] [16] but has not gained wide acceptance in the west. Nevertheless there is a significant body of evidence which illustrates that neural coherence involving the brain and/or brain waves may be physiological significant [17]. Finally it is an objective of the Human Brain Project to understand and adapt the relationship between cognition and brain function in order to develop a novel mechanism of medical diagnosis which could be used e.g. to diagnose the pathological correlates of Alzheimer's disease.

5. Conclusions

This article adds to the body of evidence which illustrates that the brain regulates the body's function through the process of neuroregulation and that multi-sensory input is the mechanism which conveys information which has positive or negative consequences upon brain function and hence upon the body's physiological stability. Indeed if this were not so, it is difficult to understand what else could explain its function and/or purpose. It is widely recognised that the brain is a biological entity however the problem for researchers—as identified by Lander—is how to differentiate between what is effectively a “*parts list*” and the “*software*” which regulates the body's function. A purely biological mechanism is unlikely, indeed almost impossible, to explain the regulation of complex systems. Something more significant—“*of biology*” but not “*by biology*”—is required.

That Grakov's technology is significant is without doubt. It is simply not possible for a diagnostic technology to make diagnostic conclusions which are so consistent with known and accepted medical findings (SVS) or to make such significant improvements to patient health (SLT) [6] [7] [9]-[11], unless it adopts a fundamental understanding of the neurological mechanism which is responsible for the regulation of the body's functional and

physiological systems which, in this case, is responsible for *communication* between the brain and the vocal chords. Note: Grakov has identified communication as one of the body's physiological systems.

It indicates that SLT could be a useful addition to the current range of dysarthria treatments [18].

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