Scientific Section of the Cranial Letter

Scientific Basis of the Primary Respiratory Mechanism Introduction and the Research of W.G. Sutherland, DO

R. Paul Lee, DO

Introduction

This, the first article of many to come, marks a new venture for *The Cranial Letter* as mandated by your Cranial Academy Board of Directors. As you may know, the Board of Directors received a very strong response to the 1998 membership survey. Approximately 29 percent of the respondents indicated they would like to see more research conducted and receive more information about the scientific underpinnings of the cranial concept in the newsletter. This column in *The Cranial Letter* is dedicated to that goal: to put into print what has been reported in the literature and what is presently happening in the realm of research, both basic science and clinical, which substantiates the phenomena of the primary respiratory mechanism as described by William G. Sutherland, DO. Critics of the cranial concept point to the paucity of research in the field and on that charge dismiss the validity of the clinicians claims of success in treating conditions of disturbed health, successes which in a great number of cases have not responded to conventional therapies.

On one hand, the reader may be surprised, after reviewing this column for a few issues, to discover what evidence already exists in the published scientific literature that supports the cranial concept. On the other hand, the reader may also discover how far ahead of basic science are the practitioners who employ the primary respiratory mechanism as a means of healing. When one considers the impact that this clinical discipline has upon the health of patients receiving it, clearly one must give to clinical science as much credence as to bench science.

Given the nature of this form of medicine, Osteopathy in the Cranial Field, it is clear that the previous "gold standard" of research, the double-blind crossover trial, so useful to evaluate a drug, must stand aside for the "outcomes studies" now being heralded by the sectors which control medical regulation and reimbursement for services. After all, the outcome of a treatment in question is what holds the ultimate interest of both patient and physician. Of course cost efficiency is a factor in the outcome, and therefore becomes, for those who pay the bills and regulate the flow of services, a strong motivation to call for outcomes studies. Side effects of a particular treatment need to be a part of the equation in valuing the outcome. Mostly, quality of life is the mark of satisfaction which the patient uses to say, "that treatment helped me", in his or her assessment of the outcome. When the physician can join the patient in that assessment of improved quality of life for the patient, then we have a good outcome, indeed.

Held to such measures as those mentioned above, the treatment provided by those doing Osteopathy in the Cranial Field matches, and in some cases exceeds any other treatment available. But how does it work? What are the mechanisms of the primary respiratory mechanism? How can we measure the effects? How can we measure the phenomena themselves, the phenomena that become very familiar to the practitioner, but are held outside of the experience of the rest of the world without some means of objectification? What can we learn about the human species by studying these extraordinary phenomena, known so well clinically, but so scantily by the scientific community?

Research of W.G. Sutherland, DO

William G. Sutherland, DO, is credited with the discovery of the five aspects of the cranial concept. However, he is not often honored as someone who did research. In fact, Dr. Sutherland's contribution is the discovery of a previously undocumented physiological phenomenon, which he named the primary respiratory mechanism, through the processes of experimentation, study and insight generated by observation. Observation is the first rung in the ladder of any investigation into the nature of reality, or in other words, the first step in scientific investigation. This article, as the first in a series of scientific articles on the cranial concept, is obligated to begin by exploring the scientific merit of the work of William Garner Sutherland, DO.

Mobility of the Cranial Bones

"The evidence is in the bones," someone once said. Sutherland took the evidence of beveled articular surfaces of cranial bones to the next level of insight. His original insight occurred at the American School of Osteopathy in 1900, when he observed the articular surfaces of the sphenoid bone appeared to be constructed "like the gills of a fish, indicating articular mobility for a respiratory motion". With this act of observation, Dr. Sutherland entered into the realm of science. Now he must establish and prove a hypothesis.

We must be willing to call straps and catcher's mitts the tools of science, if we are to accept Dr. Sutherland as a scientist. He also used a penknife to dissect the skull that he called "Mike", for want of research funds to purchase disarticulated skulls. Such a dissection is no small feat by itself. Unlike disarticulated skulls that we may obtain today,

Mike could be reconstructed and taken apart again by ingenious arrangements of screws and rubber bands that only the knowledge and skill of a dedicated scientist could devise. Through intricate study (observation) of the sutural arrangements, Sutherland learned that the skull is indeed put together in a way that allows for a respiratory motion to operate from within. The respiratory motion is frozen in this inanimate structure of desiccated bone for inspection, after the fact. In life, this motion, he reasoned created the beveling by the very act of this respiration, the evidence of life itself.

Mobility of the Dural Membranes

He also discovered, when he acquired another specimen of a skull for research, that he must remove the dura if a more efficient process to disarticulate the skull were to succeed, that process being to place dried beans into the interior of the skull through the foramen magnum and just add water. The swelling beans did the work. Is this scientific investigation? No grants or IRBs here. He had now established the relationship between the bones and the dura, the beginnings of the idea that the dura guides and limits the motion of the bones.

Fluctuation of the Cerebrospinal Fluid and the Core Link

Then one day, as he was wondering about the article he had just read about the vital functions all being controlled in the floor of the fourth ventricle, he applied pressure to his own occiput with the belts and mitts, creating the first compression of the fourth ventricle (CV4). This was to prove to himself the primacy of the cranial respiratory motion over the abdominal diaphragmatic motion. He took this experiment almost to the point of unconsciousness. But as he released the strap to take off the pressure, he observed (observation once again) that his sacrum moved and that there was a surging of fluctuating fluid up and down the spinal column, throughout the ventricles, and surrounding the brain. He now could conclude that the cerebrospinal fluid fluctuates, not just circulates and that the sacrum and cranium comprise one functional unit. Repeating the experiment, as any good scientist would, proved to Sutherland that these insights were indeed true.

Sutherland's Fulcrum

He next reasoned that such motion must have a point around which it is organized, a fulcrum which is not moving, but a point around which the motion gains its power. This he also referred to as a stillpoint. He also realized that a fulcrum itself can move without changing its function as a fulcrum. He found, through experiments while standing on his head and assuming other postures, that the junction between the falx cerebri and the tentorium cerebelli provides the location of this fulcrum, which he termed the "suspension-automatic-shifting-fulcrum". His students honored him by renaming it "Sutherland's Fulcrum". However, the indignity of one's wife finding the scientific investigator standing on his head to do his science would not qualify in many people's minds as "good science".

Knowledge vs. Information

Nevertheless, Sutherland insisted, against his wife's fearful pleading, that he must do these experiments upon himself, in order to *know*, not to just have *information* that he would read about from someone else's experiments. His understanding of these aspects of human physiology were first hand. He knew them to be true. He spoke with authority that derived from his personal observations. These observations were repeated to verify them. He was convinced of their veracity. This knowledge is what makes Sutherland's scientific investigation even more compelling, indignity aside.

Creating and Releasing Clinical Compression

Then came the assurance to his wife when the most dangerous experiment yet performed was contemplated, to create an occipitomastoid compression: "I am doing this because there is some reason why I must. It has been so the entire way and this is one more step. I have been taken care of and I know the protection will continue. Amazing things are opening up. I haven't been brought this far only to be let down. There is no need for fear or doubt." Tremendous force was applied to the occiput with a wooden bowl attached with leather straps to the wall that Sutherland tightened by pushing his feet against the wall. He had the assistance of his wife, Adah, who reinforced his hands with hers on the mastoid portions of his temporal bones. Sutherland recorded that he was extremely nervous, tense and sharply irritable after this membranous articular lesion was established. He indicated that he was "seeing things" during those days that he lived with this strain. To release the strain, he placed a pad beneath the apex of the sacrum, "to direct the cerebrospinal fluid to the occiput". Meanwhile, Sutherland used his fingers to ease the mastoid portions from the position in which they had been held and circumducted the occiput back into the direction from which it had come during the production of the strain. Sutherland told Adah, "The strain was released briefly and easily". The imposition and release of the strain required an in-depth knowledge of the mechanics of the bones, achieved by his earlier study. He was establishing new knowledge of diagnostic problems and therapeutic solutions. The next step was to begin to apply this knowledge in his clinical practice. From theory, to understanding the components of the mechanism, to creating and releasing lesions, he moved next to clinical application.

Clinical and Basic Science Research

This is where most of the progress of Osteopathy in the Cranial Field has remained, in the clinical practice. But scientists from several areas of investigation have come across evidence for oscillations of fluid, of metabolic activity, of the movement of ions, of bones and of the circulation of blood that will be reported in subsequent publications. Research is being carried out and more is being planned to look at outcomes from the application of the cranial concept clinically. These studies will be reviewed in future articles. Some information that will be presented in subsequent articles will be more theoretical or may refute the

present line of thinking to some degree. Hollis H. King, DO, PhD and I will be responsible for writing articles and will be ready to accept your comments. If you have an article that you would like to be considered, please send it to the editor of *The Cranial Letter* for review and possible acceptance for publication.

▲

References

Sutherland, Adah Strand, *With Thinking Fingers*, The Story of William Garner Sutherland, DO, DSc (Hon.), The Cranial Academy, 1962.

The Osteopathic Management of Children with Down's Syndrome

Nicholas JR Handoll, DO

Abstract

This paper raises the hypothesis that postnatal hypoxia causes much of the handicap of Down's syndrome and that osteopathic treatment may be used effectively to reduce it. Down's syndrome is a congenital foetal growth disorder due to trisomy of chromosome 21, which affects all metabolic processes but manifests fundamentally as an immaturity of the nervous system. Its widespread effects are due to impaired buffering against a range of disorders of development which are seen in isolation in individuals in the normal population. The infant is immature at birth, but at that time the development of much of the structure of the infant's tissue is essentially close to normal limits for the age. Evidence is presented to support the proposal that much of the handicap of Down's syndrome is not due directly to the chromosomal defect, but to impaired postnatal development as a result of hypoxaemia from upper airway obstruction. It is proposed that appropriate treatment from birth given by suitably trained osteopaths can offer a safe, non-invasive and effective means of maintaining a patent airway. It is postulated that this will reduce some of the severe and widespread disabilities which handicap the individual with trisomy 21.

Key words: Osteopath, children, Down's syndrome, trisomy 21, upper airway obstruction, sleep apnoea, hypoxia, hypoxaemia

Introduction

This paper raises the hypothesis that postnatal hypoxia causes much of the handicap of Down's syndrome and that osteopathic treatment may be used effectively to reduce it.

It was 93 years after Landon Down in 1866 first described the syndrome which now bears his name, when Lejune in 1959 showed that this commonest form of mental handicap affecting 800 - 1,000 live births p.a. in the U.K. is due to extra genetic material carried on the long arm of chromosome 21. Down's syndrome is a congenital foetal growth disorder which affects all metabolic processes but fundamentally involves the nervous system. There are a wide range of characteristics; a small number of cases exhibit them all, some cases only a few. Some 80 percent of the manifestations of Down's syndrome are only minor anomalies which are commonly seen in isolation in the overall population. The effect of the extra genetic material of chromosome 21 appears to decrease the buffering to disordered development as the foetus grows, which results in a greater incidence of minor anomalies.

General Features

The fundamental deficiency in Down's syndrome involves the nervous system, but the overall characteristics involve the physical appearance and behavior as well as intellectual function. Physically, the more obvious characteristics are well known. Hypotonia, or floppiness in the newborn, is the most consistent feature. Historically, before the development of chromosomal analysis, hypotonia, the lack of normal muscle tone and response to stimuli for the age, were the most reliable first indications of the presence of Down's syndrome. The oriental expression is often not evident in the newborn.

The physical phenotype of Down's syndrome includes hypotonic muscles with flexible joints and short stature. The head is shorter in its A/P diameter, there are epicanthic folds with the characteristic slant to the eyes and a depressed nasal bridge. The lenses can be aplastic leading to refractive errors. The ears are small and the dentition is hypoplastic and immature. The neck is short. The hands have characteristic short digits, there may be clinodactyly, a simian crease and characteristic dermatoglyphic features to the palms. The feet show a gap between the first and second toes. The pelvis is hypoplastic with an outward lateral flare, The heart is anomalous in 40 percent of cases. The skin is dry and hair sparse. The genitalia are generally immature.

The nervous system is underdeveloped. The anterior commissure is small and immature, and the dendrites of the cortical neurones are abnormal. The child suffers from learning difficulties which can vary in range in different individuals from profoundly handicapped to within normal range of intelligence.

Pueschel summarized the clinical conditions commonly observed in the Down's syndrome population from infant to adulthood. In the very young, they include congenital anomalies such as cataracts, gastrointestinal anomalies and heart disease During early childhood common problems are infectious diseases, increased appetite, periodontitis, seizure disorders, sleep apnoea, visual impairment, audiologic deficits, thyroid dysfunction and skeletal problems. During adolescence maturation and health issues such as skin infections, thyroid disorders and increased weight gain are significant as well as mental health concerns. Similar concerns may also be observed during adulthood which is often marked also by accelerated aging and the threat of Alzheimer's disease. [1]