

Unique Studies of CranioSacral System Being Conducted at MSU Osteopathic College

A possible key to some learning disabilities, behavioral problems and autism is being studied by researchers at Michigan State University's College of Osteopathic Medicine.

John Upledger, D.O., F.A.A.O., and Ernest Retzlaff, Ph.D., are examining the craniosacral system, the structures and components of which (such as the skull, the meninges and the cerebrospinal fluid) provide the environment for the brain and spinal cord.

Their research has led them to the hypothesis that some physical and behavioral difficulties may be caused by a lack of accommodation in the system, directing cerebrospinal fluid pressures internally on the brain and spinal cord.

Cranial sutures not calcified

They confirmed in their initial studies that the pressure of cerebrospinal fluid rhythmically changes, normally rising and falling eight to ten times a minute. In checking the skull's ability to comply with these changing pressures, they found that transducers hooked to the crania of live monkeys indicated continual movement between the two parietal bones.

Retzlaff, a professor of biomechanics, in cooperation with researchers at the University of Washington, conducted a histological investigation of the cranial sutures, the "seams" in the skull which traditionally have been considered to be solidly calcified.

Examining monkey tissue and samples across sutures from human surgical patients, they found indications that the sutures were living joints, capable of subtle motion, and fully calcified only under pathological conditions.

They discovered collagen and elastin, networks of blood vessels and nerves, and nerve receptors. Also present in the sutures were osteoblasts (bone-producing cells) and osteoclasts (bone absorbing cells).

Electrophysiological studies

Next Upledger, associate professor of biomechanics, and Zvi Karni, visiting professor of biomechanics, cooperated in a study of the electrophysiological effects of manipulation of the cranium. Monitoring electrocardiograms, respiration, and electrical potential changes by the use of electrodes above the knee and foot, Karni could independently predict what manipulative techniques Upledger was using.

Interexaminer reliability

To test reliability of the techniques for cranial examination, a double-blind study of 19 parameters of motion was conducted with 25 nursery school children. Upledger would examine the children and report either severe restriction, transient restriction or normalcy on each parameter. Another investigator – either Robert C Ward, D.O., professor in the Office of Medical Education Research and Development and of family medicine; Fred L. Mitchell Jr., D.O., professor of biomechanics; or Irvin J. Gastman, Ph.D., D.O., MSU-COM alumnus – would examine the same patient independently. The researchers found that they had more than 88% overall agreement on the parameters.

Learning Disabilities

In a study published in the June 1973 issue of the Journal of the American Osteopathic Association, Upledger reported on a standardized craniosacral examination which he conducted on a mixed sample of 203 grade school children. His contact with the children was strictly limited to the investigation of cranial mobility. School teachers, psychologists and specialists independently classified the students into relevant physical and behavioral groupings.

Overall the correlation between craniosacral motion and development problems in these children was extremely high.

Statistical analysis confirmed the craniosacral examination was a significant predictor (probably by chance of less than 1 in 1000) of designations of “not-normal,” behavioral problems, learning disabilities, obstetric complications and motor coordination problems.

Upledger plans double-blind research of learning disabled children in Flint, examining the effects of cranial manipulative treatment, placebo treatment and no treatment.

Autistic children

Upledger has also been working with 28 autistic children in Genesee County, examining the craniosacral system, blood proteins by electrophoresis, physical structure, and hair trace mineral content.

Among these children, none had normal motion of the cranium in more than two of the 19 parameters. Hair analysis of 17 children demonstrated 16 with abnormal mineral content, and with Aluminum Toxicity. All children also had extreme restriction of the thoracic cage and diaphragm, and a significant number of cyanotic fingernails.

Upledger is now beginning a six-month treatment program with these autistic children, which will include craniosacral therapy, use of oxygen and carbon dioxide to stimulate respiratory nerve centers, continuation of hair analysis, and osteopathic manipulative therapy for thoracic restriction. Continued monitoring of blood proteins will be carried out.