

Cranial Osteopathy and Nutrition in Stimulation of Cellular Bone Growth

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This topic was chosen to educate general public with the knowledge by combine manual therapy, diet, supplementation in stimulating or implementing preventative measures for cellular bone growth regardless of age, ethnicity and sex.

Cranial Osteopathy

Many cranial osteopathy and craniosacral books reference to one man as the father of this concept; William G. Sutherland (1873-1954). Sutherland, a student of Dr. Andrew T. Still became interested in the cranial movement, anatomy, physiology, and biomechanics when he was at the American School of Osteopathy. Sutherland was taught that every structure exists because it performs a particular function and while looking at a disarticulated skull, Sutherland was struck by an idea that the cranial sutures of the temporal bones where they meet the parietal bones were “beveled, like the gills of a fish, indicating articular mobility for a respiratory mechanism” (Jäkel, 2012, p.456-65). With this idea, he performed experimentation, intense studies over many years and postulate an involuntary mechanism and name “The Primary Respiratory Mechanism” (Nicholas E.A, 2011, p.554). Sutherland primary respiratory mechanism has five basic components:

1. The inherent motility of the brain and spinal cord
2. Fluctuation of the cerebrospinal fluid
3. Mobility of the intracranial and intraspinal membranes
4. Articular mobility of the cranial bones
5. The involuntary mobility of the sacrum between the ilium

Cranial Osteopathy techniques or cranial-sacral therapy are non-invasive, and indirect palpation focusing on communication of the cranium movement. Cranial techniques, theories, philosophy’s has continue on surviving in this world even though the American Cancer Society quote “ available scientific evidence does not support claims that craniosacral therapy helps in treating cancer or any other disease” (Craniosacral therapy, American cancer society, 2012).

Cerebrospinal Fluid (CSF)

The CSF a fluid that fills cavities inside the brain, those cavities are called ventricles. CSF clear watery plasma like, produces roughly 500 ml per day in four different ventricle. This fluid reabsorbed constantly, only 100-150 ml will be present and produced in the choroid plexus at the roof of each ventricles and flows towards sacrum. It functions includes:

Buoyancy: The average human brain weight approximately 1300-1400 grams. CSF allows the brain to maintain its density without being impaired by its own weight, which would cut off blood supply and kill neurons in the lower section without CSF. (Saladin K, 2007, p.520).

Cushion: Protection from injury when jolted or hit such as motor vehicle accident, sport related head injury. However when the injury is from more direct force contact with the skull, it may cause brain damage and even death.

Communication: This is where the pituitary gland secretion hormones such as growth into areas of the body needed to growth. If one of the cranial joints becomes restricted in its movement, it will impede the CSF fluctuation, blood circulation and drainage causing pressure on the brain.

This will interfere with the nervous system development possibly resulting in learning disability, hyperactivity, bone growth etc.

Clearing Waste: CSF flushes toxins from the brain and also exchange nutrients needed to support brain function. This function increases during sleep.

Pituitary Gland

Pituitary gland is a pea size gland located inside the sphenoid bone. Its function, hormone secretion gland. One of the hormones secreted through pituitary gland is Growth Hormone, also known as GH. GH allows the size and number of cells in the body for growth, reproduction, stimulate protein synthesis, secretion of IGF-1 in the liver. IGF-1 stimulates growth-promoting effects on almost every cell in the body, such as skeletal muscle, cartilage, bone, kidney, liver, skin. Secretion of GH can be affected by malnutrition, impede of the CSF (Laterra J, 1999), lack of growth hormones receptors (Vittorio L, 2014).

Nutrition

Diet suggestions:

Consume less red meat, process meat
Consume less high in sodium
Consume less sugar
Consume less coffee and alcohol
Consume more water
Consume more fruits and green leafy vegetables

Lifestyle suggestion:

Get plenty of sleep (7-8 hours)
Weight bearing excises
Take Yoga Classes
Smoke less or not at all
When sitting make sure the back straight
Proper Posture and Gait

It is important to remember that in order for the body to maintain homeostasis it must be in an alkaline environment. When we consume fatty red meats or acid base foods, the body will naturally involuntary balance the acid in order to maintain alkaline momentum. In order for this conversion, the body uses calcium to neutralize the acid thus stimulation of osteoclast to resorption calcium into the blood. Choosing an “Alkalinizing Diet” (Schwalfenberg G.K., 2012) would be an ideal benefit for cellular bone growth. Here are some of the benefit:

1. Increased fruits and vegetables in an alkaline diet would improve the K/Na ratio and may benefit bone health, reduce muscle wasting, as well as mitigate other chronic diseases such as hypertension and strokes.
2. The resultant increase in growth hormone with an alkaline diet may improve many outcomes from cardiovascular health to memory and cognition.
3. An increase in intracellular magnesium, which is required for the function of many enzyme systems, is another added benefit of the alkaline diet. Available magnesium, which is required to activate vitamin D, would result in numerous added benefits in the vitamin D apocrine/exocrine systems.
4. Alkalinity may result in added benefit for some chemotherapeutic agents that require a higher pH

Supplementation can vary on the individual in terms of digestion, absorption, elimination. In general practices combination of Vitamin D3, K1, Calcium, Magnesium, Boron, Zinc would be the best formula for bone regeneration and provides preventative measures. Calcium requires Vitamin D to be activated in the blood and Vitamin K is used to bring Calcium in to the blood. Boron helps maintain the levels of minerals and hormones balance that the body needs such as testosterone and estrogen. Zinc is use on daily activities, immune system, the mineral needed to build and perform functions of a cell membrane, synthesis of collagen, postaglandin synthesis and most importantly for hormones, growth, energy metabolism. Foods containing superoxide dismutase (SOD), a powerful antioxidant that has the ability to relief bone and joint pain but also taken as a prevention for degenerative joint disease. These can be found in melon, cantaloupe, high citrus fruits such as blueberries, guava and vegetables such as broccoli, wheatgrass, brussels sprouts, cabbage.

Treatment

According to Don Cohen, D.C (1995) the sphenoid plays a significant role in the craniosacral dynamics. It relates the neurocranium to the face, palate, vision, smell, also pituitary. The sphenoid exhibits six ranges of motion such as flexion, side bending, torsion, vertical, lateral, and compression. While patient is in supine position, practitioner will place their hands across the base of the occiput. The thumb contact posterior of the orbit without pressure from the beginning to “feel” the involuntary movement produced of flexion and extension. Once that is achieved, begin light compression from your thumb toward your hand for a moment then lift your thumbs anteriorly. The occiput should sink into your palms allowing the sphenoid to shift. After this is completed, recheck the steps to see the range of motion if there is changes in the elasticity or the “feel” of ease of relaxation.

There are not many treatment that “may” stimulate the pituitary gland to secrete GH in order for the liver to secrete IGF-1. However as stated above in communication of CSF a joint that is restricted impede the CSF fluctuation. Mobilization techniques of Cervical, Thoracic, Lumbar, Sacroiliac joints or transverse process (TVP) should also be in the treatment plan such as:

Cervical Spinal Mobilization

Technique: Supine lateral to medial rocking

Action: Patient is in supine, practitioner contact with fingertips on the TVP, apply gentle movement of lateral to medial from C1-C7 while palms stabilizing the clients head

Lumbar Spinal Mobilization

Technique: Posterior to Anterior Double Edged Hand

Action: Patient is in prone, practitioner contact on TVP of L5 with palms facing each other, fingers protracted, pressure on posterior to anterior

Sacroiliac Joint Mobilization

Technique: Posterior to Anterior of Sacrum Joint with Pelvic Pull

Action: Patient is in prone, practitioner place one hand on the superior border of sacrum while fingers protracted towards the head and place one hand on the Anterior Superior Iliac Spine (ASIS). Pressure is on sacrum posterior to anterior while pulling ASIS up (posterior) off the table

Reference

Jäkel A., Von Hauenschild P. (2012). *A systematic review to evaluate the clinical benefits of craniosacral therapy. Complementary Therapies in Medicine* 20 (6). P.456–65

Nicholas E. A, Nicholas A. S. (2011). *Atlas of Osteopathic Techniques*. P.554

"Craniosacral therapy". American Cancer Society. December 2012. Retrieved August 2013

Saladin, K. (2007). *Anatomy and Physiology: The Unity of Form and Function*. McGraw Hill. p. 520.

Laterra J., Keep R., A Betz L., Goldstein G.A., (1999). *Blood—Cerebrospinal Fluid Barrie*.
<http://www.ncbi.nlm.nih.gov/books/NBK27998/>

Vittorio L., Vittorio B.E.,. (2014). *Effect of GH/IGF-1 on Bone Metabolism and Osteoporosis*.
<http://www.hindawi.com/journals/ije/2014/235060/>

Schwalfenberg G.K. (2012). *The Alkaline Diet: Is There Evidence That an Alkaline pH Diet Benefits Health?*. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3195546/>

Cohen D., (1995) *An introduction to Craniosacral Therapy*. P. 100

