

The Effect of OMT on Functional Outcomes and Anti-inflammatory Biomarkers in Mild-to Moderate TBI

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Disclosure

- ▶ Medical Director at Origami Brain Injury Rehabilitation Center
- ▶ Faculty at MSU in the department of PMR
- ▶ AOA grant funded research project

Objectives:

- ▶ Overview of current research project
- ▶ Discuss OMT techniques used
- ▶ Identify barriers in research process

Research Question:

- ▶ Test the hypothesis that a certain set of OMT procedures performed on patients with mild to moderate TBI will result in accelerated rates of recovery



Goal

- ▶ Establish a foundation for using OMT procedures to accelerate recovery of patients following mild to moderate brain injuries and to find correlations between cognitive function, biochemical markers and self reported assessments of quality of life.

AOA Grant Funded

- ▶ \$150,000
- ▶ 2 year study
 - ▶ No penalty for extension
- ▶ Anticipated 180 participants
 - ▶ 60 in each group

Criteria

Inclusion:

- ▶ Over the age of 18
- ▶ Diagnosis of mild to moderate TBI (concussion included)
- ▶ Symptoms of headache and/or dizziness

Exclusion

- ▶ Any contraindications to OMT
 - ▶ Acute fractures, malignancy, etc
- ▶ Currently receiving OMT externally
- ▶ Minor
- ▶ Acquired brain injury
 - ▶ Stroke, anoxic BI

AIMS:

▶ Aim #1:

- ▶ Recruit and organize TBI patients into 3 groups
 - ▶ Control
 - ▶ Treatment
 - ▶ Sham

▶ Aim #2:

- ▶ Examine the effect of OMT on clinical outcomes
 - ▶ Neurocom Balance Manager
 - ▶ Vestibular Oculomotor screen
 - ▶ Motion sensitivity test
 - ▶ HIT-6
 - ▶ Dizziness handicap inventory
 - ▶ QOL

▶ Aim #3:

- ▶ Analyze urine and plasma samples
 - ▶ Before and after
 - ▶ Looking for alterations in levels of low molecular weight compounds or protein components to identify potential biomarkers that may correlate with the BI condition and/or the OMT.



Methods

- ▶ Randomized into 1 of 3 groups.
- ▶ 13 weeks of treatment
- ▶ All subjects are evaluated by a PT
- ▶ Those in the treatment of sham group will have weekly OMT/sham treatments by a DO physician or resident

Methods cont

- ▶ All participants will have urine and plasma samples before and after treatment on weeks 0, 6 and 12
- ▶ Evaluation of outcome measures (Nuerocom balance manager, HIT-6, QOL, etc) will be completed at week 0, 6 and 12.
 - ▶ OMT/sham treatment are not billed.

Metabolite Profiling

- ▶ Endogenous anti-inflammatory Oxylipins
 - ▶ Anti-inflammatory metabolites that do not involve the COX metabolic pathway
 - ▶ People take NSAIDs for pain
- ▶ Endocannabinoid metabolites
- ▶ Neurosteroids
- ▶ Neurotransmitters
 - ▶ GABA
 - ▶ Glutamate
- ▶ Catecholamines
 - ▶ Epinephrine
 - ▶ Norepinephrine
 - ▶ Dopamine

OMT Treatment

- ▶ Thoracic paraspinal lateral stretch
 - ▶ The physician stands at the side of the patient
 - ▶ The patient lies in a later recumbent position with the side to be treated upright. Flexion of the patients hips is used for stability
 - ▶ The patients upper arm is placed over the physicians cephalic arm with both hands and fingers placed medially to the longissimus muscle
 - ▶ A gentle lateral traction is applied rhythmically with focus on the hypertonic tissue until softening occurs.
 - ▶ Physician places both of the hands, using the finger pads on the medial border of the scapula
 - ▶ Stretch is applied in the direction of the fibers of the rhomboid muscle until release is appreciated
 - ▶ Repeat on other side

OMT cont

▶ Cervical spine bilateral lateral stretch

- ▶ Patient supine
- ▶ Physician is at the head of the bed using the finger pads of both hands to contact the medial aspect of the cervical paraspinal muscles
- ▶ While leaning back, a lateral and superior force is applied to the musculature, moving superior to inferior or inferior to superior
- ▶ Treatment is directed to the areas of hypertonicity and soft tissue congestion in a rhythmic manner with attention being paid to tissue softening as an end point before proceeding

OMT cont

▶ Suboccipital Release

- ▶ Patient supine
- ▶ Physician is at the head of the bed with fingertips in contact with the inferior aspect of the occiput, over muscular attachments
- ▶ Flexion of the distal interphalangeal joints is applied. Gentle traction is also applied bilaterally, by the physician slightly leaning back.
- ▶ Physician asks the patient to inhale and then exhale while slowly leaning back during exhalation and appreciates the soft tissue relaxation

OMT cont

▶ Condylar decompression

- ▶ Patient supine
- ▶ Physician is at the head of the bed cradling the occiput with the palms in a supinated position and elbows apart.
- ▶ Physician's third finger pads are placed along the inferior aspect of the occiput pointing in an anteromedial position bilaterally in the direction of the condyles as far as the tissues will allow
- ▶ Physician flexes the interphalangeal joints and allows the weight of the occiput to mechanically separate the condyles.
- ▶ A gentle, mild cephalic and posterolateral traction on each side of the occiput may be applied to allow for further softening of the tissues
- ▶ The physicians elbows are brought together resulting in further separation of the third fingers and decompression of the condyles
- ▶ Pressure is continued until a release of the tension is appreciated with softening of the tissues on each side of the occiput

▶ Venous Sinus Release:

- ▶ Patient is supine
- ▶ Physician is at the head of the bed with the third finger pads of each hand in contact with the external occipital protuberance of the occipital bone
- ▶ The weight of the head is carried on these finger pads until the physician appreciates a softening sensation of the bone and/or warmth, and the beginning of inherent motion
- ▶ Maintaining a similar position, the finger pads are moved sequentially along the midline of the occiput bone about a finger's width down in the direction of the foramen magnum (caudally), awaiting the same softening sensation and/or warmth and the sensation of the inherent motion
- ▶ Physician returns to the external occipital protuberance with the head resting on the pads of all four fingers of each hand along the superior nuchal line from medial to lateral to the inferior lateral angle or the parietal bones until the same softening and/or warmth, and the beginning of inherent motion are appreciated
- ▶ The physician again returns to the external occipital protuberance and addresses an area about an inch superior to the protuberance (posterior aspect of the sagittal suture)
- ▶ With the palms of the hands facing the surface of the head, the physician places the pad of the left thumb just to the right of midline, and the pad of the right thumb to the left of midline
- ▶ Thumbs are crossed and a gentle separative force is applied
- ▶ When softening, warmth, and inherent motion are appreciated, the thumbs are then moved about an inch forward and the procedure is repeated.
- ▶ The physician continues step by step along the sagittal suture towards the bregma
- ▶ To complete the anterior portion of the sinus the physician places the finger pads on either side of the metopic suture of the frontal bone
- ▶ The right fingers are on the right side of the suture and the left fingers on the left side
- ▶ Gentle pressure is used with a slight separating force maintained until softening and physiologic motion are palpated
- ▶ The hands are then removed from the head

OMT Thought Process

Headache

- ▶ Cervicogenic
- ▶ Tension at the OA
- ▶ Venous sinuses travel through the cranial dura
 - ▶ Twisting/tension may produce pain

Dizziness

- ▶ Temporal bone alignment

Pit falls: We ARE clinicians!

1. FOLLOW PROTOCOL
2. Sham is hard to do
3. Placebo effect?



Current Progress

- ▶ 13 People Enrolled
 - ▶ Control: 6
 - ▶ Treatment: 3
 - ▶ Sham: 3
 - ▶ Randomization causes numbers to be uneven
 - ▶ 2 dropped out secondary to funding: one in treatment and one in sham
- ▶ Asked one person last week: waiting on response
 - ▶ Have several new admissions coming in who qualify

Challenges

- ▶ Recruitment
 - ▶ Patients feel 13 weeks is too long
 - ▶ Want to be in treatment group
 - ▶ Funding
 - ▶ All of this despite the \$200 honorarium for completing the study
 - ▶ Scheduling
- ▶ Vision
 - ▶ Neurovisual optometry → prism glasses or vision therapy → OT not PT
- ▶ Working within a budget
 - ▶ Factors out of your control

Things I wish I knew

- ▶ My limitations
 - ▶ Time
 - ▶ Patients
 - ▶ Recruitment
 - ▶ Grant requirements
 - ▶ Every 6 month progress report
 - ▶ \$\$
- ▶ Budget
 - ▶ Phlebotomist

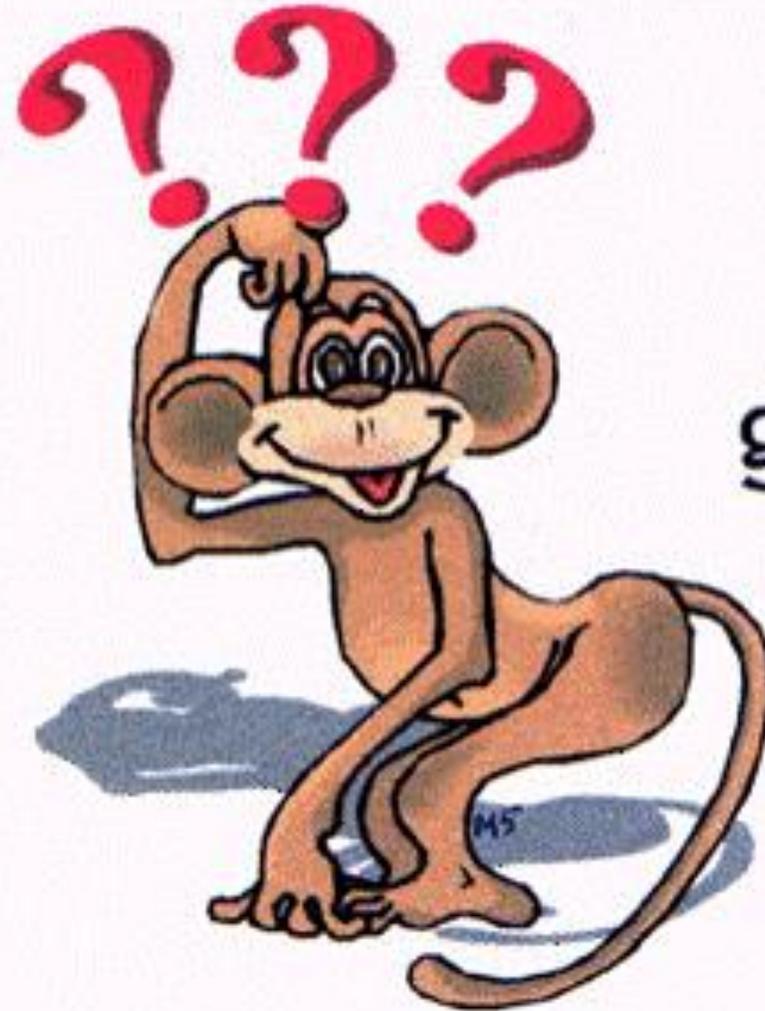
Planning on Research?

- ▶ Strongly Recommend
 - ▶ Working with someone who has done research before
 - ▶ Have a good study coordinator
 - ▶ Amanda Carr
 - ▶ Be REALISTIC!

THANK YOU!

- ▶ Dr. John Wang
- ▶ Dr. Dan Jones
- ▶ Dr. Sherman Gorbis
- ▶ Amanda Carr
- ▶ Shannon Culp
- ▶ Dr. Tegtmeier
- ▶ Dr. Tohkie

Questions?



Questions
are
guaranteed in
life;
Answers
aren't.

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