Efficacy of Vodder Manual Lymphatic Drainage of the Head and Neck on Adolescents with Post-Concussion Symptoms

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Committee:
Department: Dr. Robert Kilgour, Dr. Geoffrey Dover
External: Dr. Anna Towers
What is a concussion?

Mild Traumatic Brain Injury


Picture: concussionweillcornell.org
Most Common Symptoms

S.H.A.D.E
S is for Sensitivity or Skill Changes

- Sensitivity to Light
- Sensitivity to Noise
- Fine Motor Skill Dysfunction
- Cognitive dysfunction
- Balance Issues

Craton N. et al. 2017. *Brain Sciences*
H is for Headaches

• Headaches
• Migraines
• Constant dull pain behind the eyes

Craton N. et al. 2017. *Brain Sciences*
A is for Attitude

- Anxiety
- Depression
- Easily Angered
- Change in Motivation
- Mood Swings

Craton N. et al. 2017. *Brain Sciences*
D is for Diet Changes

- Stomach aches
- Nausea
- Vomiting
- Lack of Hunger
- Crave sugary foods

Craton N. et al. 2017. *Brain Sciences*
E is for Eye Changes or Energy Changes

• Blurred vision
• Double Vision
• Eyes Sensitive to light
• Vestibular dysfunction
• Easily Fatigued
• Changes to Sleep patterns (sleep too much or insomnia)

Craton N. et al. 2017. *Brain Sciences*
Long-term effects

• Post-Concussion Syndrome
  • Barlow KM.. et al. 2010. *Pediatrics*

• CTE (chronic traumatic encephalopathy)
• ALS
• Parkinson’s
  • Thomsen Gm et al. 2016. *Journal of Trauma and Acute Care Surgery*

• Punch drunk syndrome (dementia puglistica)
Post-Concussion Syndrome

29.3% of concussion-related ER visits result in post-concussion syndrome

58.5% of concussions symptomatic at 1 month

If still symptomatic at 100 days, 40% chance of staying symptomatic

Babcock L. et al. 2013 *JAMA Pediatrics*  
Barlow KM. et al. 2010 *Pediatrics*
Current Treatments

• Graded Exercise

• Manual Therapy

• Visual Exercises
  • Grabowski et al. 2016. Physical Therapy in Sport

• Neuropsychological Evaluations and Rehabilitation
  • Prince c. 2017. Brain Science
• There is a need for better rehabilitation

• Despite following approved treatment protocols, changes in brain still detected post medical clearance.

Churchill NW. et al. 2017 Scientific Reports
Neuro-Inflammatory Markers

• Post-Concussion Syndrome Should be Post-Inflammatory Syndrome

• Increase in cytokines IL-\( \beta \), IL-6, TNF\( \alpha \), and IFN-\( \gamma \)

Rathbone ATL. et al. 2015 *Brain Behaviour and Immunity*
Possible Mechanism
Outline of Presentation

Outline of Presentation

Background

Project

Methods

Significance

Acknowledgements

References
Lymphatics and the brain

• Discovery of lymph vessels around cranium.

• Mapping of meningeal and sinus lymphatics in 2015
  • Louveu et al. 2015. Nature
Possible Mechanism
The effect of Vodder lymphatic drainage massage on post-concussion symptoms in adults

Preliminary Data
Research Objectives

• To assess the effectiveness of a standardized Vodder Manual Lymphatic Drainage (VMLD) massage therapy protocol in adolescents 13-18 years old with post-concussion symptoms on Rivermead Questionnaire and SCAT5 memory and cognitive test scores.

• To compare these findings with the “touch” control group.
Hypothesis

• VMLD protocol of 15 treatments will significantly decrease post-concussion symptoms according to Rivermead and SCAT5 memory and cognitive questionnaire scores.

• The touch control group will show minimal symptom improvement according to Rivermead and SCAT5 memory and cognitive questionnaire scores.

• Improvements in symptoms will be significantly greater in the VMLD group than “touch” control group.
Methods

• Comparing VMLD to a touch-control group
Treatment Group

• Vodder Lymphatic Drainage
  • Cranium
  • Face
• Special Techniques
• Intra-Oral Technique
Touch Treatment
Methods - Participants

• N=20
• N=10 VMLD group  N=10 Control group
• Adolescents 13-18 years old
• Post-Concussion Syndrome
Methods - Treatment

• 15 treatments
• 60 minute appointments
• 3 – 5 times a week
Methods - Testing

Rivermead Questionnaire and cognitive and memory test from the SCAT5 Questionnaire on appointments 1, 7 and 15

<table>
<thead>
<tr>
<th>Tx</th>
<th>1</th>
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<th>3</th>
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<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
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<tbody>
<tr>
<td>Rivermead</td>
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</table>

Rivermead Post-Concussion Questionnaire
Questions: Memory recall (short-term and long-term and cognitive tests from SCAT5)
Preliminary Data

The effect of Vodder lymphatic drainage massage on post-concussion symptoms in adults
Anticipated Outcome

Looking for an interaction between the two

Tukey’s post hoc
Outline of Presentation

- Background
- Project
- Methods
- Significance
- Acknowledgements
- References
Significance

• May be an important asset in the rehabilitation of concussions
• Unsure if inflammatory markers and tau proteins will be affected with VMLD
Acknowledgements

• Supervisor: Dr. Robert Kilgour

• Committee Members: Dr. Anna Towers, Dr. Geoffrey Dover

• Robert Harris from The Vodder Institute
References - Pictures

• concussionweillcornell.org
• http://muscleandjoint.ca/mississauga-pain-clinic-conditions-treated/headaches/
• www.healthyplace.com
• www.tumericforhealth.com
• www.santephysique.com

• https://www.bartleby.com/107/177.html


References


References


References


Questions?
Rivermead Questionnaire

RIVERMEAD SYMPTOM CHECKLIST

We would like to know whether, at the present, you suffer from any of the symptoms we list below. Because many of these symptoms occur normally, we would like you to compare yourself as you are now compared with how you were before the accident.

For each, will you please circle the number closest to your answer

<table>
<thead>
<tr>
<th>KEY</th>
<th>0 Not experienced at all</th>
<th>1 Was a problem but no more</th>
<th>2 A mild problem</th>
<th>3 A moderate problem</th>
<th>4 A severe problem</th>
</tr>
</thead>
</table>

Compared with before the accident, do you now suffer from (please circle):

- Headaches: 0 1 2 3 4
- Feelings of dizziness: 0 1 2 3 4
- Nausea and/or vomiting: 0 1 2 3 4
- Sensitivity to noise, easily upset by noise: 0 1 2 3 4
- Poor sleep: 0 1 2 3 4
- Tiring more easily, fatigue: 0 1 2 3 4
- Being irritable, easily angered: 0 1 2 3 4
- Feeling depressed or tearful: 0 1 2 3 4
- Feeling frustrated or impatient: 0 1 2 3 4
- Forgetfulness, poor memory: 0 1 2 3 4
- Poor concentration: 0 1 2 3 4
- Taking longer to think: 0 1 2 3 4
- Blurred vision: 0 1 2 3 4
- Upset by bright light: 0 1 2 3 4
- Double vision: 0 1 2 3 4
- Restlessness: 0 1 2 3 4

Are you having any other difficulties?

Please describe and rate them as above

1 __________________________ 0 1 2 3 4
2 __________________________ 0 1 2 3 4
### Step 3: Cognitive Screening

#### Orientation

<table>
<thead>
<tr>
<th>Item</th>
<th>Score</th>
<th>Points</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>2</td>
<td>2</td>
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<td>Date</td>
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<td>Email</td>
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</table>

#### Concentration

**Digits Backwards**

<table>
<thead>
<tr>
<th>Digits</th>
<th>Score</th>
<th>Points</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>9-8-7-6</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>8-7-6-5</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

**Concentration Number Line (Place score)**

<table>
<thead>
<tr>
<th>Score</th>
<th>Points</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

### Step 4: Neurological Screen

#### Balance Examination

**Modified Balance River (MBR)**

<table>
<thead>
<tr>
<th>Task</th>
<th>Perform</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stand</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Walk</td>
<td>Yes</td>
<td></td>
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</tbody>
</table>

#### Step 5: Delayed Recall

#### Step 6: Decision

**Scores**

- **Concentration Total Score (Digits + Number Line)**: 9

**Notations**

- **Name**: SCAT5
- **Date**: April 29, 2017
- **Add**: 123.45.67
- **Email**: user@example.com

**Score the SCAT5 and use the results to determine if the athlete is ready to return to competition.**

**Scoring on the SCAT5 should not be used as a stand-alone method to diagnose concussion, measure recovery, or make decisions about an athlete's readiness to return to competition after concussion.**