### Changes in intracranial compliance & quality of life in migraine subjects receiving an atlas intervention using a National Upper Cervical Chiropractic Association (N.U.C.C.A.) procedure

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#### Introduction National Following Cervical Upper

**Chiropractic Association (NUCCA)** atlas vertebrae misalignment correction, previous case study revealed a significant decrease in migraine symptoms with accompanying increased intracranial compliance (ICCI) and venous pulsatility decrease.

Study objective to measure, using Phase **Contrast Magnetic Resonance Imaging (PC-**MRI), changes in ICCI from baseline to week-four, and eight, following a NUCCA intervention of neurologist screened migraine subjects. Secondary outcomes comprised several Health Related Quality of Life (HRQoL) measures used specifically in documenting patient perceived changes in migraine status.



Safe and precise correction - No history of sustained adverse reaction to care

- Post x-ray determines atlas position has been restored to a 'normal' orthogonal alignment in frontal & transverse planes.



# **Results - Intracranial Compliance Index**



# **Results - HRQoL Measures**

<u>eline</u> ean D)	<u>4 week</u> Mean (SD)	<u>8 week</u> Mean (SD)	<u>Difference</u> Baseline to 4 wks. Mean (95% CI) p-value	<u>Difference</u> Baseline to 8 wks. Mean (95% CI) p-value
ary			5	3
4.5	11.4	8.7	3.1 (0.19, 6.0)	5.7 (2.0, 9.4)
5.7)	(5.2)	(4.3)	p = 0.039	p = 0.006
2.8	2.6	2.1	0.17 (-0.53, 0.86)	0.69 (-0.32, 1.71)
.96)	(0.89)	(1.18)	p = 0.604	p = 0.158
Quality	y of Life			
l.2	55.3	53.8	8.9 (4.9, 13.0)	10.4 (6.9, 13.8)
.8)	(7.7)	(6.8)	p < 0.001	p = 0.001
3.4	69.1	73.5	30.7 (22.4, 38.9)	35.1 (23.5, 46.6)
'.4)	(22.7)	(28.0)	p < 0.001	p < 0.001
8.3	82.4	81.2	29.1 (15.9, 42.3)	27.9(12.9, 43.1)
8.5)	(16.9)	(29.2)	p < 0.001	p = 0.002
4.1	83.2	86.8	29.1 (16.8,41.4)	32.7 (21.3, 44.5)
3.1)	(16.9)	(16.9)	p < 0.001	p < 0.001
<u>eline</u> ı (SD)	<u>12</u> <u>week</u> Mean (SD)	<u>Difference</u> Mean (95% CI) Baseline to 12 wks. p-value		
<b>5.</b> 7	14.6	32.1 (13.2, 51.0)		
.7)	(23.8)	p = 0.004		

#### **Descriptive statistics (mean and standard deviation) for Headache Diary & Health Related Quality of Life (HRQoL) Measures:**

HIT-6: Headache Impact Test-6; MSQL – E: Migraine-Specific Quality of Life Measure-Emotional; MSQL – P: Migraine-Specific Quality of Life Measure-Physical; MSQL – R: Migraine-Specific Quality of Life Measure-Restrictive; MIDAS: Migraine Disability

- Statistics used between baseline follow-up use mean difference analyzed with

- Headache days, intensity, MIDAS & HIT-6 scores decrease show improvement

### **Discussion &** Conclusions

- 1. Eleven subjects studied; 8 female, 3 males.
- 2. Average age: 41 years (range 20 61).
- 3. Ten subjects presented migraine without aura.
- 4. Migraine duration Mean: 23 years.
- 5. Subjects remained on medications. Use decreased.
- 6. ADVERSE REACTIONS:
  - a) Ten subjects self-reported tolerable mild neck pain occurring for more than 24 hours after intervention. Pain was mild with no impact on daily activities or med use.
- 7. One study **limitation** is absence of control group.
- 8. Consistency of magnitude & direction of improvement across HRQoL measures indicates improvement in headache health.
- 9. Intervention did not result in overall statistically significant change in ICCI as hypothesized.
- 10. Literature reports a secondary venous outflow pattern exists for many migraine patients.
- 11. Increase in compliance of subjects with secondary drainage, significance unknown.
- **12. NUCCA correction associated with reduction** in migraine frequency, marked improvement in **HRQoL & large reduction in headache-related** disability in pilot subjects.

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