Use of Sequenced OMT (Osteopathic Manual Treatment) and AGR-H model to Identify and Resolve Control Parameters inhibiting Optimal Motor Control in a BioTensegrity System: Measured Utilizing a Pressure Sensitive Treadmill

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Introduction/Background

An AGR-H (Area of Greatest Restriction–Hindrance, or in osteopathic terms, key somatic dysfunction) acts as a limiting or negative control parameter within a biotensegrity1,2 system: limiting the function and efficiency of motor control, and eliciting painful regions, frequently where the body cannot adequately compensate for the AGR-H. Remarkably, the AGR-H is frequently asymptomatic until identified by palpation. Using sequenced OMT treatment approaches to treat the AGR-H frequently resolves multiple painful areas within the biotensegrity system, removes the limiting control parameter, improves joint and fascial mobility, and achieves immediate, statistically significant changes in motor control.

Methods

Edward G. Stiles DO, FAAODist, developed, and utilizes a unique screening assessment that provides clinical information specific to each patient and a sequenced, problem solving paradigm allowing clinicians to determine the AGR-H, and most effective, efficient treatment approach [3,4].

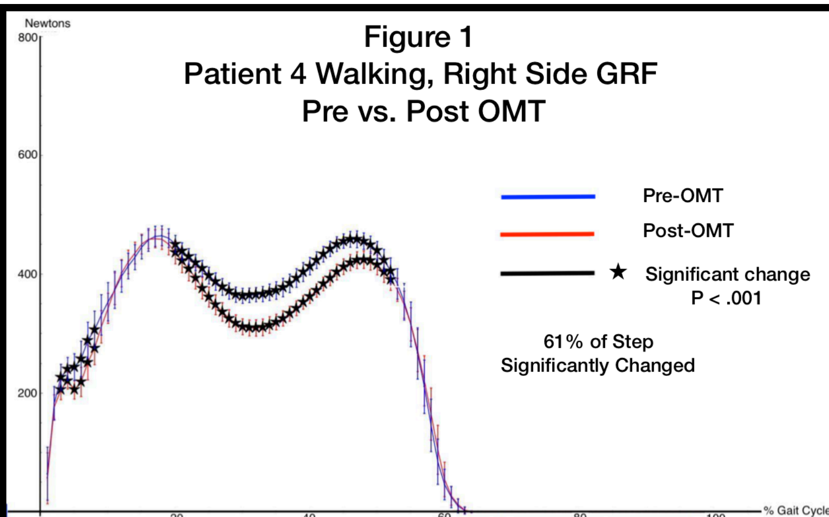
10 single case studies, (n-*of*-1)[5] consisted of 10 volunteers, 4 track runners referred with minor running related injuries, and 6 patients evaluated, but not yet receiving physical therapy treatment. Subjects received **one** OMT treatment by Dr. Stiles, utilizing the AGR-H model. Utilizing a Pressure Sensitive Treadmill (PRT), Ground Reaction Force (GRF) measurements were recorded over one minute of walking (approximately 50 strides), and/or running (approximately 85 strides).

Results

GRF curves measuring each step in the one-minute trial were averaged to determine the mean and standard deviation of the GRF curve for each volunteer. A two-sided T-Test compared each 1% measurement of the gait cycle pre- and post-treatment with p value $<.001$ considered statistically significant change (Figures 1 and 2). Subsequently, each 1% increment of the GRF curve exhibiting $p<.001$ change was tabulated for each person, whether running or walking, and considering the gait cycle portion when the foot contacted the ground: ie, 25% change, indicating 25% of ground contact time exhibited change pre vs post with greater than 99.9% confidence (Tables 1 to 3).

Conclusion

Previous research attempts were unsuccessful in validating clinical/functional results with manual approaches. These findings suggest sequenced treatments utilizing the AGR-H model may provide the sequencing necessary for a more efficient, effective approach. Measurement tools such as the PST appear effective in validating these results.



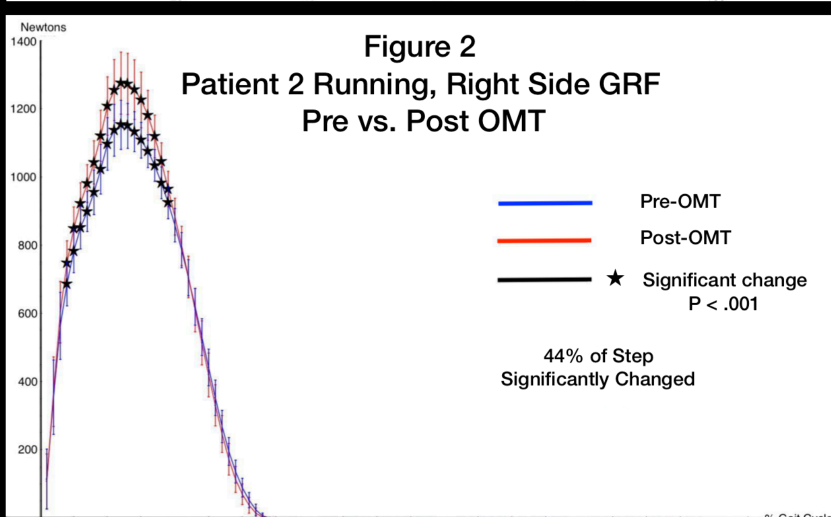


Table 1: Group Mean % of ground contact time in walking trials showing significant changes in Ground Reaction Force (GRF) after sequenced OMT and AGR-H model [p value < .001 (99.9% confidence)]

	Mean % of Steps	Standard Dev.
Left Steps	64.5%	30%
Right Steps	58.5%	29%
Both	61.5%	29%

Table 2: % of ground contact time in walking trials showing significant changes in Ground Reaction Force (GRF) after sequenced OMT and AGR-H model [p value < .001 (99.9% confidence)]

	% of Left Steps	% of Right Steps
Runner 1	95%	97%
Runner 2	79%	78%
Runner 3	97%	91%
Runner 4	78%	79%
Patient 1	5%	29%
Patient 2	20%	11%
Patient 3	57%	28%
Patient 4	74%	61%
Patient 5	76%	51%
Patient 6	64%	60%

Table 3: % of ground contact time in running trials showing significant changes in Ground Reaction Force (GRF) after sequenced OMT and AGR-H model [p value < .001 (99.9% confidence)]

	% of Left Steps	% of Right Steps
Runner 1	87%	74%
Runner 2	83%	44%
Runner 3	12%	25%
Runner 4	49%	5%