Walsh, A., et al., (2025). *J Rehab Pract Res* 6(1): 169
https://doi.org/10.33790/jrpr1100169

Journal of Rehabilitation Practices and Research

Cupping's Impact on Protective Sensation in Conservative Carpal Tunnel Treatment: A Brief Report

Abbigail Walsh OTD[1,2*], Ann Marie Potter PhD[1], Aubrey Bealer MS[1], Lee Bryant MS[1], and Emily Giordano MS[1]

[1]*Department of Occupational Therapy, Moravian University,1441 Schoenersville Rd., Bethlehem, PA 18018, United States.*

[2]*St. Luke's University Health Network, 801 Ostrum Street, PPHP-2, Bethlehem, PA 18015, United States.*

Article Details

Article Type: Research Article
Received date: 18th April, 2025
Accepted date: 19th May, 2025
Published date: 21st May, 2025

[*]**Corresponding Author:** Abbigail Walsh OTD, Assistant Professor, Department of Occupational Therapy, Moravian University,1441 Schoenersville Rd., Bethlehem, PA 18018,United States.

Citation: Walsh, A., Potter, A. M., Bealer, A., Bryant, L., & Giordano, E., (2025). Cupping's Impact on Protective Sensation in Conservative Carpal Tunnel Treatment: A Brief Report. *J Rehab Pract Res, 6*(1):169. https://doi.org/10.33790/jrpr1100169

Abstract

The study aimed to compare the impact of cupping therapy and conservative occupational therapy on protective sensation in individuals diagnosed with carpal tunnel syndrome (CTS). The study found that cupping therapy, when used alongside conservative therapy, significantly improved protective sensation in the hand and wrist, thereby enhancing the functionality and participation in meaningful occupations of the participants.

Design: A retrospective cohort study.

Methods: A total of 46 participants met the inclusion criteria by attending a minimum of four 45-minute sessions with a licensed and registered occupational therapist (OT), receiving either conservative treatment with cupping or conservative treatment without cupping. The researchers assessed the efficacy of cupping in CTS treatment using the Semmes-Weinstein (SW) monofilament test as a measure of detecting protective sensation. Non-parametric statistical tests were used to examine the mean change in SW scores of the index finger from pre-test to post-test within the cupping group, as well as the mean change in SW scores between the cupping group and the reference group.

Results: The researchers found a significant difference between the cupping group's evaluation SW score and their discharge score (t= 7.66, $p < 0.001$). The mean change of those who received cupping therapy in addition to conservative treatment was significantly higher than that of subjects who received conservative therapy alone (z=3.82; $p < 0.003$). This difference indicates that participants who received cupping therapy for their CTS experienced a statistically significant improvement in protective sensation.

Conclusion: Cupping may be a valuable adjunct to occupational therapy (OT) treatment, enhancing hand and wrist functionality and potentially increasing participation in meaningful daily activities. These results point to the need for further exploration and integration of the cupping modality into occupational therapy practice.

Keywords: Occupational Therapy, Conservative Therapy, Improved Sensation, Negative Pressure Therapy, Modality, Carpal Tunnel Syndrome

Introduction

This retrospective study aimed to investigate the effect of the negative pressure modality of cupping on the treatment of conservatively managed carpal tunnel syndrome. It was hypothesized there would be a significant difference between groups in protective sensation scores post dry cupping and conservative occupational therapy compared to those treated with conservative treatment alone. The literature supports the conservative management of carpal tunnel syndrome (CTS) to increase protective sensation, including various modalities such as stretching, moist heat, and cryotherapy [4-8,11]. The modality of cupping via negative pressure, however, lacks the strong support needed to be implemented in typical conservative therapy strategies and therapeutic protocols [1,3].

Protective sensation was tested using the Semmes-Weinstein monofilament test for this study. Although the Semmes-Weinstein is not a validated diagnostic tool for carpal tunnel syndrome, it is widely supported for its use in non-invasive assessments to detect and measure protective sensation levels [9,10].

The researchers reviewed records from forty-six individuals who met the study's inclusion criteria, which consisted of an EMG result no higher than moderate dysfunction, indicated by sensory potential being preserved and slowing distal motor latency (<6.5 ms), an abnormal Semmes-Weinstein score upon evaluation (3.61 or greater), a primary diagnosis of carpal tunnel, a referral from a hand surgeon, and completed a minimum of 4 treatment sessions [2]. Records were accessed for all patients treated from May 2022 to May 2023, who had signed consent-to-treat forms and met the inclusion criteria. The participating health network provided Institutional Review Board approval.

Of the forty-six participants, twenty-four (7 males, 17 females) received dry cupping therapy in conjunction with conservative occupational therapy treatment, which included median nerve glides and neurological reeducation. The ages range for this group was 37 to 81 years old, with an average age of 60.54. Twenty-two participants (7 males, 15 females) only received conservative therapy for their CTS

symptoms. The ages in this group ranged from 37 to 82 years, with an average age of 60.5 years.

The treatment protocol for both groups included forty-five-minute treatment sessions and a similar protocol. Conservative therapy for both groups consisted moist heat, followed by soft tissue mobilization, median nerve glides, and neurological reeducation. At this point, the groups deviated, and the conservative group received therapeutic activity. The cupping group received therapeutic activity and static cupping via silicone cups placed once over the affected carpal tunnel for five minutes, with sufficient pressure to create and maintain a seal on the hand [12].

A Wilcoxon signed-rank test was used to detect changes from the initial evaluation (pre-test) to discharge (post-test) in each group. There was a statistically significant change noted in both groups, indicating an improvement in protective sensation (Table 1). A Mann-Whitney U test was used to determine if there was a difference between groups. A significant difference (z=3.823, $p < 0.003$) with a moderate effect size (r^2= 0.49; 95% CI) was found (Table 2). These results suggest that the cupping group had a significantly greater improvement in protective sensation.

Intervention	Evaluation SW Score (Mean ± SD)	Evaluation SW Score (Mean ± SD)	t	df	p -value
Cupping (n=24)	3.658 ± 0.428	2.895 ± 0.220	7.657	23	< 0.001*
Conservative (n=22)	3.710 ± 0.600	3.710 ± 0.600	2.319	21	< 0.031*

Table 1: Wilcoxon Signed-Rank Index Finger Semmes-Weinstein Scores

Note. SD= standard deviation; SW= Semmes-Weinstein; p-value < 0.05

df	Effect Size	95 % Confidence Lower	95 % Confidence Upper	*p- value*
44	0.487	0.192	0.701	< 0.003*

Table 2: Mann-Whitney Mean Change in Semmes-Weinstein Scores Cupping and Conservative

Note. *p-value < 0.05

These findings highlight the significant potential of cupping therapy in enhancing protective sensation in adults with mild to moderate carpal tunnel syndrome (CTS). They provide compelling evidence that cupping is an effective adjunct to occupational therapy treatment enhancing the functionality of the hand and wrist and potentially increasing participation in meaningful occupations. While current literature primarily supports the use of wet cupping therapy in individuals who have undergone CTS surgery, this study contributes to the limited literature on the role of cupping therapy in occupational therapy, offering new insights and avenues for further research.

Given the small sample size and limited geographic area of this study, its external validity and generalizability may be somewhat reduced. The retrospective nature of this study also limits our ability to determine causality. For instance, we do not know why the patients received cupping, as this decision was made by the treating therapist on a case-by-case basis. This underscores the need for further research, particularly using a randomized control design with a larger sample, to explore how different cupping techniques (dry vs. wet) compare with conservative interventions. Such research could provide a more comprehensive understanding of the potential benefits of cupping therapy in the treatment of CTS.

The limited available literature surrounding this topic underscores the significant results of this study, which are likely to be influential in the field of occupational therapy and its treatment of CTS across all adult populations. Strengthening study designs and addressing limitations can pave the way for a more comprehensive understanding of cupping therapy's role in improving sensory deficits associated with CTS.

Statements and Declarations

Ethical Considerations: This study received ethical approval from the St. Luke's University Health Network IRB (approval #SLIR 2023-62) on July 11, 2023. This is an IRB approved retrospective study; all patient information was de-identified, and patient consent was not required for participation. Patient data will not be shared with third parties.

Declaration of Conflicting Interest: The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding Statement: The authors received no financial support for the research, authorship, and/or publication of this article.

Acknowledgements: We express our deep gratitude to Dr. Kristofer Matullo, MD, FAOA, for his commitment and unwavering support of this study.

References

1. Al-Bedah, A. M. N., Elsubai, I. S., Qureshi, N. A., Aboushanab, T. S., Ali, G. I. M., El-Olemy, A. T., Khalil, A. A. H., Khalil, M. K. M., & Alqaed, M. S. (2018). The medical perspective of cupping therapy: Effects and mechanisms of action. *Journal of Traditional and Complementary Medicine, 9*(2), 90–97. https://doi.org/10.1016/j.jtcme.2018.03.003
2. Bland, J. (2000). A neurophysiological grading scale for carpal tunnel syndrome. *Muscle & Nerve, 23*(8), 1280-1283. https://doi.org/10.1002/1097-4598(200008)23:83,1280::AID-MUS20>3.0.CO;2-Y
3. Farhat, A., & Mughal, S. M. (2021). Is there a role of cupping therapy in the treatment of carpal tunnel syndrome in primary care settings?. *Cureus, 13*(1), e12954. https://doi.org/10.7759/cureus.12954
4. Glazer, C., & Pantea, C. (2019). Systematic review of treatment methods for the carpal tunnel syndrome. *Timisoara Physical Education & Rehabilitation Journal, 12*(22), 7–12.

5. Hernández-Secorún, M., Montaña-Cortés, R., Hidalgo-García, C., Rodríguez-Sanz, J., Corral-de-Toro, J., Monti-Ballano, S., Hamam-Alcober, S., Tricás-Moreno, J. M., & Lucha-López, M. O. (2021). Effectiveness of conservative treatment according to severity and systemic disease in carpal tunnel syndrome: A systematic review. *International Journal of Environmental Research and Public Health, 18*(5), 2365. https://doi.org/10.3390/ijerph18052365

6. Huisstede, B. M., Hoogvliet, P., Randsdorp, M. S., Glerum, S., van Middelkoop, M., & Koes, B. W. (2010). Carpal tunnel syndrome. Part I: effectiveness of nonsurgical treatments--a systematic review. *Archives of Physical Medicine and Rehabilitation, 91*(7), 981–1004. https://doi.org/10.1016/j.apmr.2010.03.022

7. Jiménez-Del-Barrio, S., Cadellans-Arróniz, A., Ceballos-Laita, L., Estébanez-de-Miguel, E., López-de-Celis, C., Bueno-Gracia, E., & Pérez-Bellmunt, A. (2022). The effectiveness of manual therapy on pain, physical function, and nerve conduction studies in carpal tunnel syndrome patients: A systematic review and meta-analysis. *International Orthopaedics, 46*(2), 301–312. https://doi.org/10.1007/s00264-021-05272-2

8. Michlovitz, S. L., (2004). Conservative interventions for carpal tunnel syndrome. *Journal of Orthopaedic & Sports Physical Therapy, 34*(10), 589–600.

9. Olaiya, M. T., Hanson, R. L., Kavena, K. G., Sinha, M., Clary, D., Horton, M. B., Nelson, R. G., & Knowler, W. C. (2019). Use of graded Semmes Weinstein monofilament testing for ascertaining peripheral neuropathy in people with and without diabetes. *Diabetes Research and Clinical Practice, 151*, 1–10. https://doi.org/10.1016/j.diabres.2019.03.029

10. Pagel, K. J., Kaul, M. P., & Dryden, J. D. (2002). Lack of utility of Semmes-Weinstein monofilament testing in suspected carpal tunnel syndrome. *American Journal of Physical Medicine & Rehabilitation, 81*(8), 597–600. https://doi.org/10.1097/00002060-13 200208000-00007

11. Shi, Q., Bobos, P., Lalone, E. A., Warren, L., & MacDermid, J. C. (2020). Comparison of the Short-Term and Long-Term Effects of Surgery and Nonsurgical Intervention in Treating Carpal Tunnel Syndrome: A Systematic Review and Meta-Analysis. *Hand (New York, N.Y.), 15*(1), 13–22. https://doi.org/10.1177/1558944718787892

12. Sucher, B. (2019). Suction decompression of the carpal tunnel. *The Journal of the American Osteopathic Association, 119*(7). 464-468. https://doi.org/10.7556/jaoa.2019.083