Internal jugular Venous Compressive Syndrome: hemodynamic outcomes after cervical vertebral decompressive manipulations

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Abstract.
Objective: we studied hemodynamic effects in Venous Compressive Syndrome of internal Jugular veins, after not-invasive treatment by cervical manipulations (RIMA® = Ricci's Manipulation). **Methods:** 26 subjects were enrolled with at least one jugular vein with complete (white) compression in frontal neck position, assessed by echo color Doppler. **Results:** after first RIMA® procedure we had a reduction of 81.25% (6/32) in the total number of internal jugular vein white compressions. **Conclusions:** our results suggest that RIMA® decompressive method may be useful to restore the drainage of internal jugular veins when a white compression occurs. Considering the novelty of this work and the total absence of scientific similar works able to confirm this data, it is necessary to continue these studies in order to improve the management of this venous hemodynamic condition.

Key words : Venous Compressive syndrome, chiropractic RIMA® manipulation, internal jugular vein compression

Objective.

Hemodynamic effects in Venous Compressive Syndrome (VCS) of internal Jugular veins, after not-invasive treatment by cervical manipulations .

Introduction.

In the last years, scientific literature highlighted Venous Compressive Syndrome of internal jugular veins in symptomatic or asymptomatic subjects, either on supine or upright position.[1,2] Many different conditions (postural, muscular, fascial, anatomical or bone anomalies) may cause VCS.
After Echo Color Doppler (ECD), we defined: "Physiological internal jugular vein flow" (N) the cross area more than 6.0 mm^2 without blood block or reflux. "White compression" (W) the internal jugular vein flow block by fully compression. Figure 1 "Black compression" (B) the internal jugular vein flow reduction (cross area less than 6.0 mm^2) by severe compression. "White-Black compression" (WB) the intermittent internal jugular vein flow, only during deglutition or postural maneuvers.

Methods.

In our preliminary study, we enrolled 26 subjects with at least one jugular vein with "white compression" in frontal neck position (defined "neutral position"), either in clino- either in ortho-static position. All subjects were assessed by ECD before and after manipulative treatment. Figure 1-2

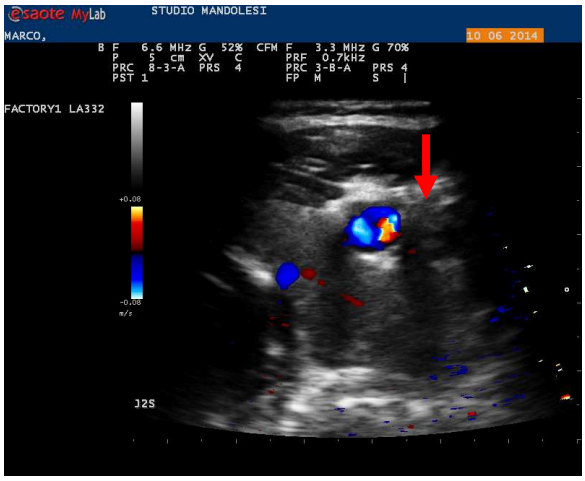

Figure 1: ECD before treatment. Red arrow: white compression of left internal jugular vein in J2.

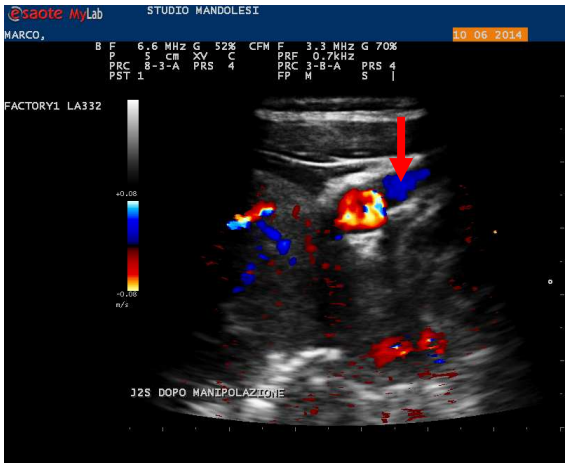

Figure 2: ECD after treatment. Red arrow: restored physiological flow in left internal jugular vein in J2.

We treated the subjects' cervical vertebrae either in clino- either in ortho-static position on weekly manipulation.
This new manipulative procedure (named RIMA® by the acronym Ricci's Manipulation) is a decompressive method developed by chiropractic and osteopathic techniques for cervical vertebrae treatment.[3] On the same time, this decompressive method includes a modulated acoustic waves massage for decontraction of cervical and back muscles.
Dr Domenico Ricci M.D. (Bari – Italy) developed this full inclusive method after 30 years of manipulation practice. The manipulative procedure is made in three times: first time for realignment of cervical vertebrae and opening of foramen magnum in supine position, second time for treatment of C1-C2 in the same position, third time for realignment of cervical vertebrae in upright position.

Results.

In our sample we had 11 male plus 15 female aged 48 ± 14 (from a minimum of 21 and maximum of 84 years, with a median of 48 and a mode of 44 years). Sixteen subjects were symptomatic, and 10 were asymptomatic.
After the first RIMA® procedure, we had effects showed in table 1. Data did not show significant difference after first RIMA® procedure between symptomatic and asymptomatic subjects with internal jugular vein white compressions.

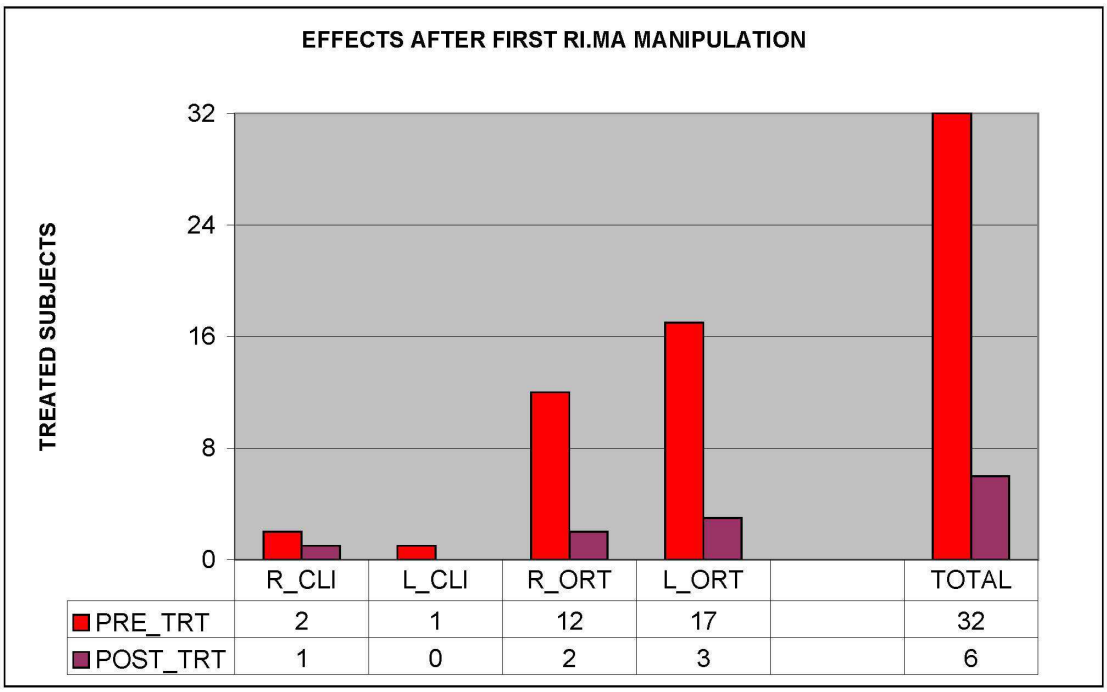

Table 1.
After first RIMA procedure we had a reduction of 81.25% (6/32) in the total number of internal jugular vein white compressions.

Legenda to Table 1.
R_CLI = right clino-static jugular veins.
L_CLI = left clino-static jugular veins.
R_ORT = right ortho-static jugular veins.
L_ORT = left ortho-static jugular veins.
PRE_TRT = before treatment.
POST_TRT = after treatment.

Discussion.
Neck venous compression syndrome is a new hemodynamic condition that may promote vascular pathologies. Many muscles can be involved in such venous compression: for example the scalene muscle could entrap the J1 terminal segment of the internal jugular vein, the omohyoid muscle could entrap the J2 medium segment of the internal jugular vein, while the sterno-mastoid muscle

can compress the J3 prossimal segment of the internal jugular vein. Some papers demonstrated by RMI this condition in symptomatic or asymptomatic subjects.[2] Up today, only surgical intervention procedure were suggested to solve these hemodynamic condition, but without significant results.[4] We suppose that all these compressions may be caused by the misalignment of cervical vertebrae with stretching of the muscles and aponeurosis with effect on neck veins. This intermittent compression block of vertebral and jugular veins could be one of the multi-factorial causes of the clinical conditions in these subjects. These subjects frequently had head and neck trauma.

Conclusions.

Our results suggest that RIMA® decompressive method may be useful to restore the drainage of internal jugular veins when a white compression occurs. This preliminary study stimulate to further researches on these venous hemodynamic condition. Considering the novelty of this work and the total absence of scientific similar works able to confirm this data, it is necessary to continue these studies in order to improve the clinical management of these subjects and to perform therapeutic strategies based on venous decompressive treatments both surgical that manipulatives.

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References

1. Mandolesi S, Manconi E, Niglio T, d'Alessandro A, Orsini A, Mandolesi D, Fedele F: *Incidence of anatomical compression of the internal jugular veins with full block of their flow in patients with chronic cerebro-spinal venous insufficiency and multiple sclerosis*; Minerva Medica 21st Eurochap-IUA 2013
2. Radak Djordje, *Incidence and distribution of extravascular compression of extracranial venous pathway in patients with chronic cerebrospinal venous insufficiency and multiple sclerosis*, Phlebology Online First, May 9, 2013
3. Palmer DD., *The Chiropractor's Adjuster: A Textbook of the Science, Art and Philosophy of Chiropractic for Students and Practitioners, Portland Printing House, Portland, OR 1910.*
4. Simka M, Majewski E, Fortuna M, Zaniewski M. *Internal jugular vein entrapment in a multiple sclerosis patient.* Case Rep Surg. 2012;2012:293568