

**Osteopathic Manipulative
Treatment effects on the
Mandibular kinetic:
kinesiographic study**



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Mandibular movement patterns have been commonly used by clinicians to investigate dysfunction of the masticatory system, the rate of freedom of jaw movements is also expression of musculoskeletal and fascial healthy [Greenman, 1998; Mitchell, 2000; Korr, 1995; Magoun, 1966].

Temporomandibular disorders (TMD) encompass a group of musculoskeletal conditions that involve temporomandibular joint (TMJ) or the masticatory musculature, or both.

These conditions are typically characterized by pain in the preauricular and other facial area that is usually aggravated by chewing or jaw function. TMD are often accompanied, singly or in combination, by limitation of jaw movement, joint sounds, muscular and fascial tenderness or joint soreness

The Mandibular Kinesiograph (MKG) is an instrument designed for research and diagnosis of mandibular function/dysfunction. It electronically records mandibular incisor-point movements in three dimensions; measurement of vertical velocity is also provided by differentiating the vertical position signal [Jankelson, 1980].

Some Authors demonstrated a relationship
between stomatognathic and postural systems.

Clark et al., 1993; Gillies et al. 1998; Solow and
Sonnesen,1998; Ehrlich et al., 1999; Yamaschita et al. 1998;
Higbie et al. 1999; Ertekin et al. 2001; Miralles et al., 2006;

Osteopathic manipulative medicine (OMM) approach asserts that with sufficient diagnostic skills, osteopathic physicians are able to identify the exact anatomic region responsible for the pain or movement restriction [Kuchera, 2005].

Then same symptoms may require dissimilar treatments plans that focus on differing local, spinal, and supraspinal targets [Kuchera, 2005].

Goals of our study is to analyse possible relation between osteopathic manipulative extrastomatognathic treatment (OMT) and mandible kinematics in order to confirm the relationship between function of stomatognathic and postural systems.

Material and Methods

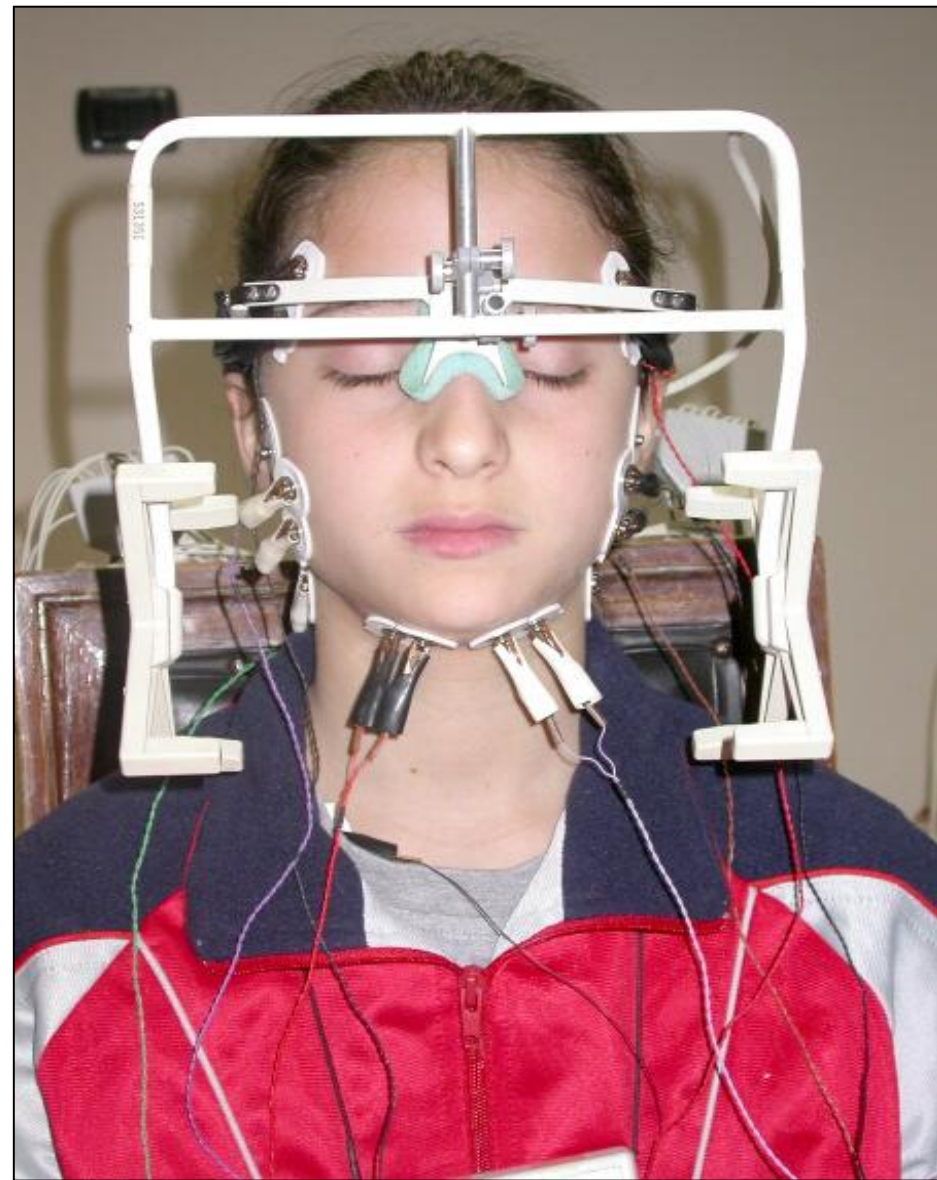
The study was performed at Dentistry Centre of University of L'Aquila. 28 TMD children (age average=12 years), selected among the patients referred to Paediatric Dentistry Department, were submitted for the study. All the patients presented: non-specific TMD symptoms, a limited mouth opening, a history of trauma (delivery trauma, accidentally trauma).

The subjects were assigned randomly to the OMT group (study group) and the no-intervention group (control group), both composed of 14 subjects. Study group subjects were submitted to two kinesiographic (Kns) trends: a first one at the first visit (T0) and a second one at the distance of two months from the end of OMT (T1). Control group subjects were also submitted to the same kinesiographic trends: the first one at the first visit (T0) and the second one at the distance of six months (T1).

The OMT delivered to the group was the Indirect Technique called Biodynamic Osteopathy in the Cranial Field

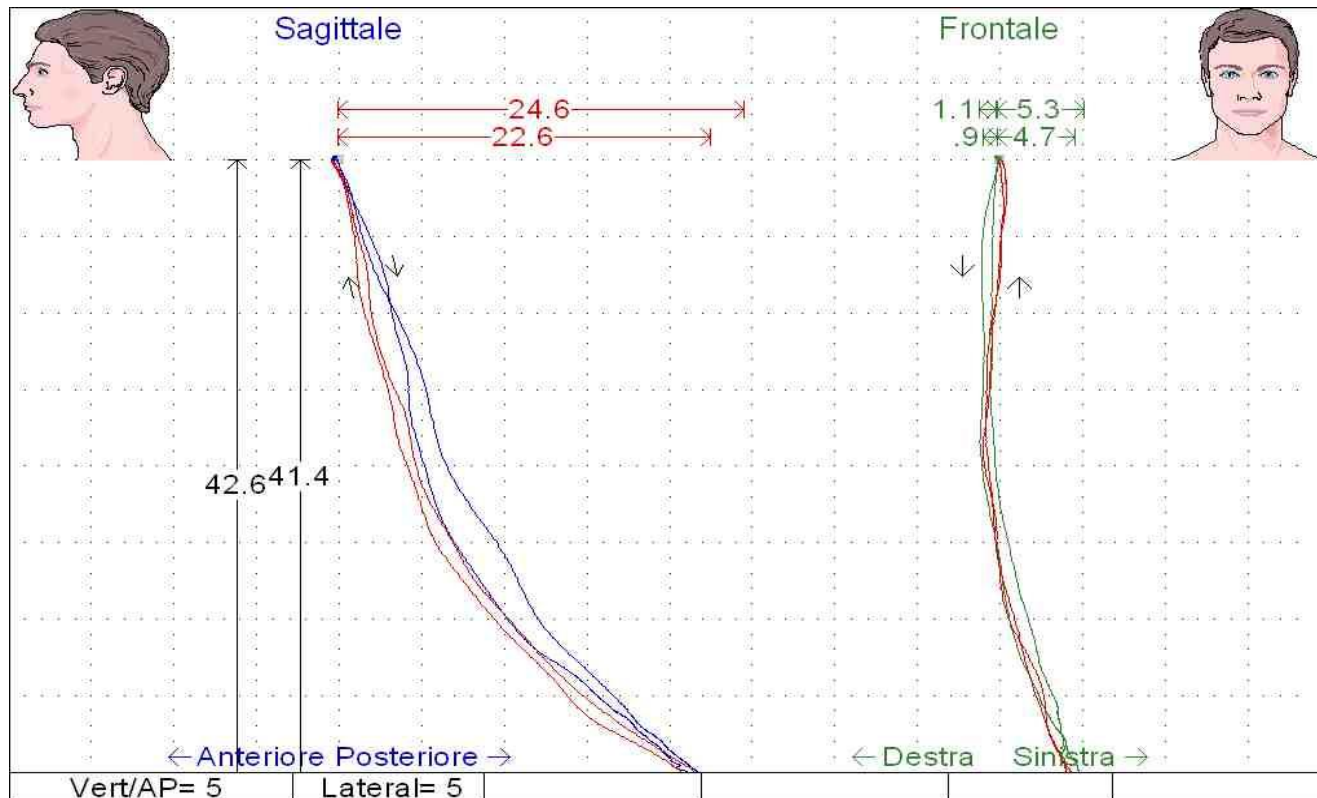
[McPartland J M 2005]

Kinesiographic tracks were acquired using K7I and positioning a magnetic sensor frame integral with the head and with the sensory field balanced on an artificial magnet stuck on the mucosa covering the roots of inferior mandibular incisors.

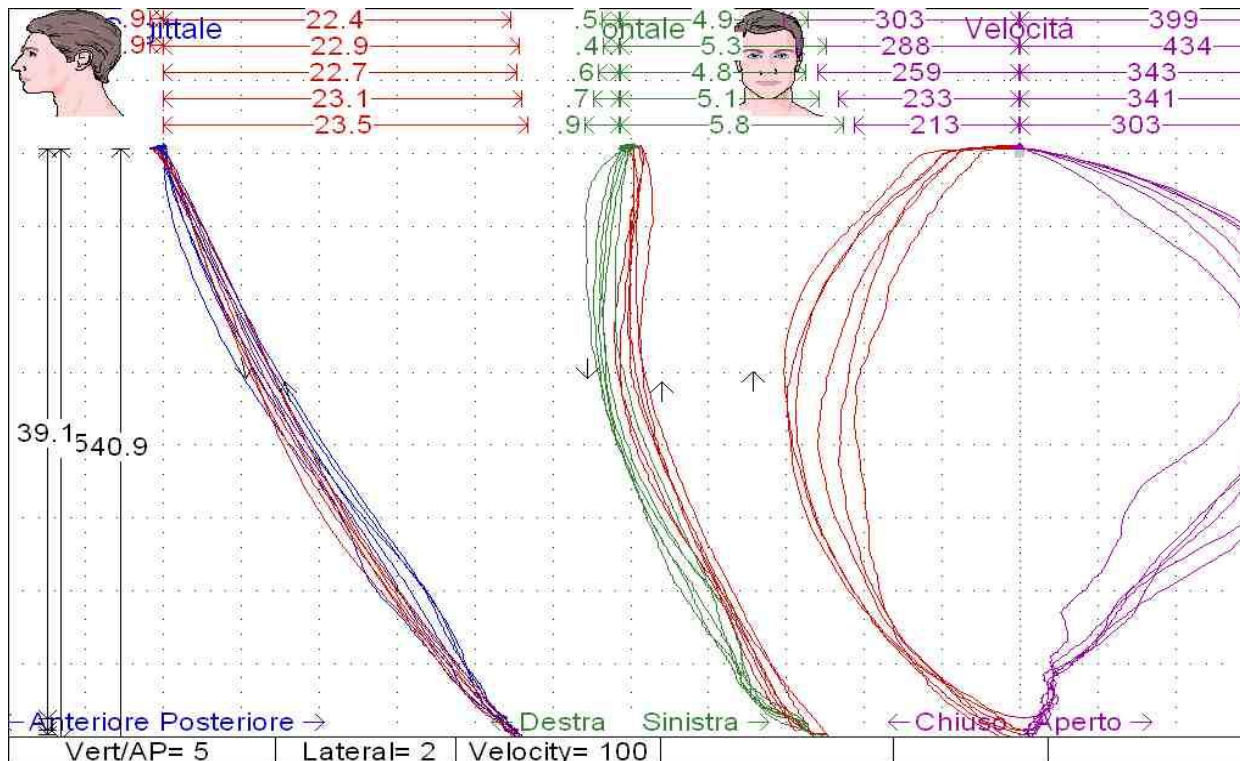


Each kinesiographic trial provided for two KNS recordings.

In the first recording (Scan1) the patient, starting from the teeth/contact position, effected 3 consequently maximal opening/closing jaw movements, to obtain Maximal Opening (MO) parameter (KNS values expressed in mm).



In the second recording (Scan2) the patient, starting from the teeth/contact position, effected 15 consequently fastest than possible opening/closing jaw movements, to obtain Maximal Opening Velocity (MOV), Maximal Closing Velocity (MCV), Opening Velocity Average (OVA) and Closing Velocity Average (CVA) parameters (KNS values expressed in mm for s^{-1}).



Statistical Analysis

In null hypothesis kinesiographic (Control Group) values in T0 and T1 aren't statistically significant, showing no difference.

Control Group

KNG	Maximal Opening (mm)	Right Lateral Deviation (mm)	Left Lateral Deviation (mm)	Maximal Opening Velocity	Maximal Closing Velocity
TO	37.5 (6.4)	6.26 (2.7)	5.3 (11.7)	298.5 (84.09)	321.7 (117.3)
T1	37.4 (1.8)	6.6 (9.1)	6.5 (6.5)	299.9 (91.22)	330.4 (103.3)

Study Group

KNG	Maximal Opening (mm)	Right Lateral Deviation (mm)	Left Lateral Deviation (mm)	Maximal Opening Velocity	Maximal Closing Velocity
T0	38.0 (8.4)	7.2 (2.7)	5.3 (13.2)	261.6 (118.2)	310 (110.3)
T1	42.6* (2.8)*	5.9 (11.1)	7.1 (6.5)	316.4** (93.0)**	330 (126.7)

* p < 0,07

**p < 0,03

Osteopathic treatment, by reducing Hypersympathicotonia as a consequence of general postural stress, could improve the range of freedom of jaw muscle activity and viscoelasticity (increase of Maximal Opening values), particularly reducing the jaw closing passive forces that seem to have a great influence on the jaw-opening dynamics.

[Koolstra and Van Eijden 1997]

The highly significant statistical improvement of Maximal Opening Velocity can only be explained as an expression of this physiological relation.

The results of this study suggest that OMT can offer a valid support in the clinical approach to TMD, confirming the multifactorial genesis of these chronic disorders.

**Grazie per
l'Attenzione**