EFFECTS OF THE ATLASPROFILAX® THERAPY ON SYMPTOMS RELATED TO TMJ DYSFUNCTION, BRUXISM AND DENTAL MID-LINE RELATIONSHIP.
Study by Dra. Victoria Eugenia Gutiérrez Navas

Dra. Gutiérrez Navas studied dentistry and orthodontistry at the Santo Tomas de Aquino University in Bucaramanga, Colombia. She specialised in aesthetic dentistry as well as TMJ rehabilitation and handling. Dra. Gutiérrez is a medical auditor and has a postgraduate in Orthodontics at USTA University according to the MEAW Japanese orthodontic approach.

Dra. Gutiérrez is an author of several articles:

- MANUAL DE SUSTENTO TEORICO PARA LAS HISTORIAS CLINICAS, CAPRECOM E.P.S. February 1996 (Theoretical support manual for clinical records)
- MANUAL DE BIOSEGURIDAD EN ODONTOLOGIA, Bucaramanga, Octubre de 1996 (Biosecurity in Odontology)
- REVISTA ORTOUSTA 2002;2:101-103 Efectividad de los magnetos en el tratamiento de Maloclusión clase II. Bucaramanga, Diciembre 2002 (Effectiveness of magneto-therapy in malocclusion treatment class II)
- REVISTA USTASALUD ODONTOLOGIA 2006;5:85-73. Morfología Craneofacial en Padres de Niños con Paladar Hendido. (Craniofacial Morphology in Parents of Children with Cleft Palate.)

In 2012 Dr. Gutierrez specialised in the Swiss AtlasPROfilax® method that combines and complements her professional work in the field of dentistry and orthodontics.
INTRODUCTION

Several studies report a close relationship between the cervical spine and the cranio-mandibular complex, both capable of being reciprocally influenced.

Altered posture of the head and neck may cause or predispose painful conditions which alter the biomechanics and muscle balance of the craniocervical region.
A forward head posture.

Extension of the upper cervical spine (C1-C3).

accompanied with flexion of the lower cervical spine (C4-C7).

Center of gravity of the head moves and the spine supports a larger weight.
The jaw muscles are part of the muscle chain that allows the individual to remain standing with an erect head.

When postural changes occur, muscle contractions at the stomatognathic system change mandibular position, which tries to adapt due to its need to operate.
Mandibular deviations during opening and closing, are manifestations of inflammation or impaired balance and position of the temporomandibular complex.

This may be the result of changes in head position.

>Capursso U. Postural and respiratory factors of the condylar position in the Temporomandibular Joint. Revista Romana de Stomatologie. 2007;13(3).

TILT AND ROTATION OF THE ATLAS
The importance of clinical examination and non-surgical treatment to control pain and dysfunction.

The limited effect the maxillomandibular appliances like plates, splints, orthodontic treatment, etc. can have.

Physical therapy in association with other treatment methods may be helpful in relieving musculoskeletal pain and improve movement.

Orthodontic therapy should be addressed to achieve structural balance to facilitate physiological adaptation and rehabilitation of patients affected by TMJD.
Note that in the head there are three joints: the craniocervical joint, craniomandibular joint (TMJ) and tooth joint, which should be treated harmoniously together.
OBJECTIVE OF THE STUDY

The study arises from the need to treat TMJ Dysfunctions by means of using alternatives.

AtlasPROfilax® is a natural therapy developed to permanently correct the wrong angle of rotation of the first cervical vertebra or "atlas".

It helps in correcting the cervical curve, the position of the head and the spatial relationship of the jaw and the rest of the body.

The goal was to describe the effect of AtlasPROfilax® therapy on symptoms associated with TMJD, bruxism and mandibular deviations in maximum intercuspation and openness, in a cohort of patients.
Type of study

Descriptive observational study

Universe and Sample

UNIVERSE: 223 patients to whom the AtlasPROfilax® method was applied.

SAMPLE: 151 patients that assist as the control session 30 or 40 days after the Atlasprofilax application.

Excluded were:
Patients with total superior or inferior prosthesis, because of intraoral or eviction movement.

Patients with thrush or any soft tissue injury pain that could affect the mouth opening.

SUB-SAMPLE: 71 patients (Photographic measurement of middle odontal line)
Sociodemographic:
• Age.
• Gender.

Clinic: taken directly from the patient
• The presence or absence of temporomandibular dysfunction (TMD).
• In patients with TMJ symptoms related to noise, jump, pain or lockjaw before and after the therapy was analysed.
• The presence of bruxism both before and after therapy.
• Perception of relief felt by the patient after treatment, which was quantified on a scale from 0 to 100% and qualitative relief Yes or No.

Obtained from photographic analysis
• Magnitude in millimeters of midline deviation; variables that were taken immediately before, after and in the monthly control.
• The difference between the midline deviation at occlusion and opening at each of those times.
For the collection of clinical data:

Taken from the medical history and from sociodemographic variables, TMJD and articular symptoms as well identified from the perceptions reported by the patient.

For the information obtained from the pictures:

The patient was placed in a sitting position without a back rest, keeping a natural posture with feet flat on the floor and knees at a 90 degree angle.

PENTAX Optio camera brand Dinecorp M40 8.0 Megapixels and 3x optical zoom, 6.3 mm-18,9mm, located on an adjustable to the height of the patient's mouth, at a distance of 33 cm tripod, was used.

The patient’s position of the head was not corrected at the time of the shot, allowing angulation or tilting the same as the tendency of the patient.
In the photographic analysis the distance between the dental midlines top and bottom in both closed and opened intercuspation were measured. The correlometer of Bimler was used. Measurements at two different times were made by the same orthodontist with 15 days difference between measurements to match coherence. Deviation from the midline in occlusion - deviation of the midline on opening in three stages. The midline line distance difference in occlusion and opening were calculated in millimeters (mm).
The AtlasPROfilax® method seeks the correct repositioning of the atlas (C1) vertebra using pressure and a controlled vibration stimulus to the short muscles of the neck that mitigates existing contractures. It is a safe treatment.

Usually, the therapy is performed only once in life. The approximate length of the appointment is 45 minutes including the history, kinesiological tests, anthropometric measurements and application itself.

The procedure is performed with the patient in a sitting position, using the AtlasPROfilax® Wellnessvib in adults and in children AtlasPROfilax® Babyvib manufactured by Automation and HC Ingenierie SA, ZI in Bovery D CH’1868 Collombey and approved in Colombia with INVIMA register # 2011000975.
Information was collected on a tool. It was systematised in Excel. The database was debugged. The information was processed in STATA 9.0. Results are presented in text, tables and graphs.

### STATISTICAL ANALYSIS

For all analyses a significance level of $\alpha$ (alpha) $\leq 0.05$ was considered:

- Microsoft Excel 5.0. Microsoft Corporation, 1997
- STATA Corporation

#### Univariate
- Summary measurements for Qualitative variables: proportions were calculated. Measurements for Quantitative: measurements of central tendency (mean and median) and dispersion (standard deviation, range, percentiles).

#### Bivariate
- TMD was associated with socio demographic variables:
  - Qualitative: Chi2 or Fisher's exact test.
  - Quantitative: Student's t test or Wilcoxon rank test.
- TMJD related symptoms before and one month were compared:
  - McNemar test.
  - The difference of the deviations from the midline before and after and monthly were monitored and correlated with the presence of TMJD
  - t Test of Student or the Wilcoxon rank test.
This research was welcomed with established ethical principles in resolution 1993 008430, while preserving the principles of beneficence, autonomy, confidentiality, privacy of information.
Table 1. Description of the socio demographic variables analysed according to TMJD before and one month after the treatment

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>TOTAL</th>
<th>TMD</th>
<th></th>
<th>p</th>
<th>WITH SYMPTOMS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
<td>MONTH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TREATMENT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TMD</td>
<td>151(100)</td>
<td>65 (43.1)</td>
<td>86 (56.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years) *</td>
<td>50.3 ±17.5</td>
<td>49.2±15.4</td>
<td>51.2±19</td>
<td>0.5227**</td>
<td>53±13.4</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>47(31.1)</td>
<td>13(27.7)</td>
<td>34(72.3)</td>
<td>0.010+</td>
<td>4 (8.5)</td>
</tr>
<tr>
<td>Female</td>
<td>104(68.9)</td>
<td>52(50)</td>
<td>52(50)</td>
<td>24 (23.1)</td>
<td></td>
</tr>
</tbody>
</table>

*Average (Standard Deviation)
**Wilcoxon rank test
+ Chi² Test
Figure 1. Distribution of age in all patients in the cohort and according presence of TMD
Table 2. Description of symptoms associated with TMD before and one month after therapy AtlasPROfilax®

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total</th>
<th>Before</th>
<th>After 1 Month</th>
<th>P**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms</td>
<td>151(100)</td>
<td>65(43.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Articular noise</td>
<td>33(21.9)</td>
<td>33(50.8)</td>
<td>14(21.5)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Articular jump</td>
<td>29(19.2)</td>
<td>29(44.6)</td>
<td>12(18.5)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Articular pain</td>
<td>32(21.2)</td>
<td>32(49.2)</td>
<td>13(20)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Lockjaw in opening</td>
<td>6(4)</td>
<td>6(9.2)</td>
<td>1 (1.5)</td>
<td>0.0243</td>
</tr>
<tr>
<td>Bruxism</td>
<td>11(7.3)</td>
<td>11(16.9)</td>
<td>4(6.2)</td>
<td>0.0082</td>
</tr>
<tr>
<td>Relief provided by treatment (%)</td>
<td>NA</td>
<td>NA</td>
<td>72.8±37.9*</td>
<td>---</td>
</tr>
</tbody>
</table>

*Average (Estándar Deviation)  **McNemar Test

The symptoms were significantly reduced after the effect of AtlasPROfilax® therapy. Noise, jump and joint pain reduced by more than half and bruxism in about 70%. 82.3% (51) of those suffering TMJD reported pain relief after therapy. The average percentage of relief was 72.8 ± 37.9, with a median of 100%.
Table 3. Mean differences deviation from the midline at maximum occlusion and openness; before, after and in the monthly monitoring analysed by level of TMJD.

<table>
<thead>
<tr>
<th>Variable</th>
<th>TMD</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>Difference midline occlusion and opening BEFORE (mm)</td>
<td>-1.4±2.3*</td>
<td>-0.4±1.6</td>
<td>0.0395**</td>
<td></td>
</tr>
<tr>
<td>Difference midline occlusion and opening AFTER (mm)</td>
<td>-1.4±2.3</td>
<td>-0.3±1.5</td>
<td>0.0110**</td>
<td></td>
</tr>
<tr>
<td>Difference midline occlusion and opening 1 MONTH AFTER (mm)</td>
<td>-0.9±2.1</td>
<td>-0.3±1.5</td>
<td>0.1562+</td>
<td></td>
</tr>
</tbody>
</table>

*Average (Standard Deviation)  **Wilcoxon rank test  + T Test
The aim of this study was to analyse the effect of AtlasPROfilax® therapy on symptoms associated with TMJD, bruxism and the ratio of the midlines in maximum opening and closing, in a cohort of patients.

Alternative treatments performed by orthodontists, for these alterations should not be limited to the correction of tooth alignment and occlusion control.
The orthodontist must know and even have the skills to intervene with the craniocervicofacial complex and the dental complex in favour of more stable and holistic treatments.

In this sense the AtlasPROfilax® therapy is an alternative that allows an approach via the cranio-cervical complex to effect the TMJ.

Based on the results of this study, this therapy has potential impact on the management of TMJD symptoms.
**GENDER AND AGE**


In this work 50%

Warren & Fried 80%

Wadhwa & Kapila 2:1

Kuttila & col confused by stress

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Analysis of the presence of symptoms before and after the AtlasPROfilax® therapy by age.

Hormonal influence

From 65 with TMJD, 52 (80%) were females.
## SYMPTOMS

<table>
<thead>
<tr>
<th>SYMPTOMS</th>
<th>TMD Prevalence</th>
<th>Articular noise</th>
<th>Articular blockade</th>
<th>Articular pain</th>
<th>Bruxism</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRABAJO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This study</td>
<td>43%</td>
<td>22%</td>
<td>4%</td>
<td>General:21%</td>
<td>7.3%</td>
</tr>
<tr>
<td></td>
<td>&lt;30 years: 14.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abou-Atme y col.</td>
<td>40-75%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Casanova-Rosado y col.</td>
<td>46%</td>
<td>50%</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sonnesen y col.</td>
<td></td>
<td>12.5%(Adolescents)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manfredini y col.</td>
<td></td>
<td>65%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


PHOTOGRAPHIC ANALYSIS


<table>
<thead>
<tr>
<th>WORKS</th>
<th>CARACTERISTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>This study</strong></td>
<td>Objective: measuring midline deviation in occlusion and openness by using frontal photography as a strategy to identify TMJD, when the head is in normal position.</td>
</tr>
<tr>
<td><strong>Armijo &amp; al.</strong></td>
<td>Objective: To obtain the position of the head and cervical spine in the sagittal plane according to the usual position of the head, associating them with TMJD</td>
</tr>
<tr>
<td><strong>Lunes &amp; al.</strong></td>
<td>He photographed the position of the head and whole body in the sagittal and frontal plane for the purpose of analyzing the craniovertebral posture and its relationship to TMJD.</td>
</tr>
</tbody>
</table>
According to data: measuring the deviation of the midlines in photographs is a good marker to analyse the TMJ while showing that the difference of the deviation is greater among people with TMJD.

This score is based on the statement by Sora and Jaramillo who believe that the clinical evaluation of the deviation from the midline in different positions, including opening and occlusion, is a strategy to detect functional asymmetries related to TMJ disorders and mandibular dynamics.

To Hirschhaut, it is normal that the midline is kept opening and closing, but can move sideways and then return (deviation) or not (deflection). In cases of subluxation, the interarticular disc is displaced and the patient has, among other signs, deviation from the midline toward the affected side.
Orthodontic treatment of patients with TMJD is complex and requires a multidisciplinary approach; diagnosis and conventional orthodontic treatment need to be modified.

In the literature the interest of promoting less invasive treatments for the management of TMJ disorders in which physical therapy, postural changes, among others, are presented as alternatives to control this dysfunction is evident.

Research to assess the impact of these treatments illustrate how the approach from this perspective is underdeveloped by orthodontists.

Postural training should be used for the treatment of TMJD because of the obvious link between TMJ disorders and craniocervical posture.

THE TREATMENT


STUDY CHARACTERISTICS

Nicolakis & al. They implemented a protocol based on passive movements, correcting posture and relaxation techniques in 20 patients with TMJ articular displacement and observed increase in mouth opening and pain reduction and treatment effect.

Wright & al. They selected 60 patients with TMJD and dysfunction of the masticatory muscles. The aim was to assess the efficacy of postural training and TMJD guidance. They took a group to which the two interventions were offered while in the control group were offered only guidelines; The results showed that 10% of individuals undergoing TMJD related symptoms disappeared.

This study In this study of 65 patients with TMJD, the AtlasPROfilax® therapy relieved the symptoms related to: articular noise 29.3%, articular jump 26.1% Articular Pain 29.2%, lockjaw on opening 7.7% and Bruxism 10.7% of patients.

COMPARED RESULTS


LIMITATIONS

It is not a controlled trial (RCT).

However, from this observational study, bases were set to develop a study related to this intervention in order to provide a higher level of evidence. This prospective observational study comparing people with and without TMJD provides analytical advances.

In assessing the effectiveness of the therapy by only one month after could lead to an underestimation of the effectiveness of AtlasPROfilax® therapy. The reason is that some patients may be at the stage of healing crisis or still improving, because the process of adjustment and the changes generated by the correct repositioning of the atlas vertebra needs time, several months, up to 24.
The specialized orthodontist, interested in treating TMJD must know and even have the skills to intervene with the craniocervicofacial complex in addition to the dental one.

The AtlasPROfilax® therapy had effect on the symptoms associated with TMJD, bruxism, and the relationship of dental midlines but requires ECC tracked at three and six months to continue evaluating the effectiveness of this therapeutic alternative.