PRELIMINARY STUDY REGARDING IDENTIFICATION AND EVALUATION OF CLINICAL AND FUNCTIONAL PARAMETERS COMMON IN DENTAL TECHNICIANS WITH PROFESSIONAL OVERLOAD CERVICAL PAIN SYNDROMES

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Keywords: *dental technician, working position, occupational overload syndromes*

Abstract: *Occupational overload syndromes represent a significant occupational problem for dental technicians. The aim of this study is represented by optimization of intervention strategies specific for myo-arthropod-kinetic pathology of dental technicians in order to improve stability and mobility of the spine, and increase the quality of life of these subjects. Subjects were included in two groups (experimental and control), experimental group benefit of a physical exercise program adapted to dental technician profession. Results demonstrate an improvement of all functional parameters for the experimental group and the quality of life of these subjects. A suitable kinetic program will reduce the negative effects created by prolonged improper working positions, which a dental technician is obliged to adopt in its activity.*

INTRODUCTION

The most common diseases that appear and develop in the case of dental technicians, are usually those at the level of myo-artro-kinetic system, caused by muscle imbalances produced, most often due to a prolonged kyphosis position. This position increases the forces exerted on the upper neck and back muscles and on intervertebral discs, these aspects leading to muscle necrosis, pain and muscle contractures. Increased pressure within the intervertebral disc leads over time to degenerative changes, increasing the risk damaging the disc.(1)

This fact has been confirmed by numerous studies conducted on the health of dental technicians, studies that revealed that the most common problems encountered were identified at the spine and upper limb. Studies conducted over time have shown that there is a correlation between the age and the health of dental technicians, but regarding the myo-arthropod-kinetic system affections, they are more common in women.(2,3) These conditions are classified as occupational overload syndromes, because of interactions between different professional risks factors.(4,5)

Generally, occupational overload syndromes have become one of the most frequent cause in general morbidity, representing a significant occupational problem, due to increased costs of compensation and health, low productivity, and a lower quality of life among dental technicians. In different studies developed over time of this occupational segment, for practitioners with cervical pain syndromes, were reported: absence from work, reduced work capacity, transfer to another workplace or even disability.(6) Overloads during work of dental technician, can be influenced by organizing changes related to working conditions, rhythm, intensity and duration of work. Dysfunctions of myo-arthropod-kinetic system must be corrected through therapy, respectively by performing regular and consistent physical exercises, to improve the tissues structure, and prevent damages that inherently occur due to maintaining a working position for a long time and work in certain environmental conditions.(7-9) Kinetic specific intervention in cervical-brachial syndromes must be focused on the muscles involved, namely the muscles of the spine and the upper limb.(10,11)

PURPOSE

The aim of this study is represented by optimization of intervention strategies specific for myo-arthropod-kinetic pathology of dental technicians in order to improve stability and mobility of the spine, and increase the quality of life of these subjects.

The objectives of this research is to identify the most efficient operational structures, elaborating kinetic programs to improve clinical and functional status of the subjects involved in research, experimenting, recording and statistical interpretation of the results.

MATERIALS AND METHODS

The study consists of two separate parts, as follows:

- In the first part, adapting the content of kinetic program to subject's possibilities will significantly increase interventional process efficiency;
- In the second part, focusing the kinetic intervention on the muscles involved, clinical and functional indexes of subjects will be improved and thus the quality of life of these subjects will increase significantly.

The working groups, place and conditions of the research: There were formed of two groups of 20 dental technicians each, who had cervical pain syndromes, the selection of subjects based on inclusion agreement in one of the research groups (experimental or control).

The differentiation between the experimental group and the control group was made as follows:

- To the control group applied a program based on exercises and massage at work;
- To the experimental group we applied, in addition to exercises and massage program at work, and individualized kinetic program at home with grading of effort and

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Article received on 30.01.2017 and accepted for publication on 27.02.2017
ACTA MEDICA TRANSILVANICA March 2017;22(1):72-74

implementing procedures for exercises, depending on subject capabilities.

The main kinetic operational objectives were:

- Reduce / prevent cervical pain syndrome;
- Increasing the mobility of the spine;
- Preventing vicious positions of the spine;
- Increasing paravertebral musculature tone;
- Obtaining stability of the spine.

RESULTS

The interpretation of results was performed using classical statistical analysis, represented by conclusive figures and charts.

The experimental group consisted of 14 women and 6 men and control group was composed of 17 women and 3 men (figure no. 1 and figure no. 2).

Figure no. 1. Subjects gender - the experimental group

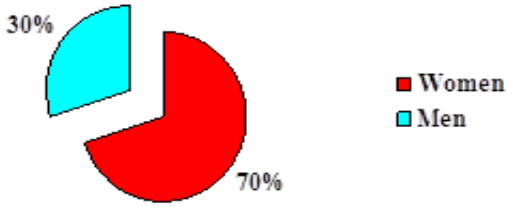
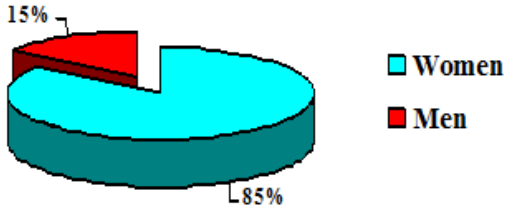


Figure no. 2. Subjects gender - the control group



Age of the subjects in experimental group ranged from 29 to 58 years, averaging 44.6 years old, and that of the control group ranged between 28 and 55 years, with a mean of 42.5 years old (table no. 1).

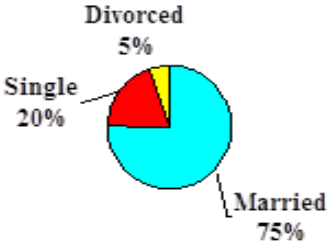
Table no. 1. Descriptive statistical indicators - age of subjects

Experimental Group		Control Group	
Indicator		**Indicator**	
Average	44,6	Average	42,5
Median	45,5	Median	45
Standard deviation	8,1	Standard deviation	9,7
Minimum	29	Minimum	28
Maximum	58	Maximum	55

Data analysis of marital status of the subjects of the two groups revealed the following:

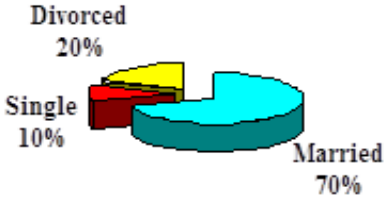
- The experimental group: 15 subjects were married, 4 singles and 1 divorced (figure no. 3);

Figure no. 3. Marital status – Experimental group



- Control group: 14 subjects were married, 2 singles and 4 divorced (figure no. 4).

Figure no. 4. Marital status – Control group



Analyzing data on the number of hours allocated to professional activity the following were observed:

- For the experimental group: 11 subjects assigned for professional work more than 8 hours a day, 6 subjects assigned for professional work 8 hours a day, 3 subjects assigned for professional work less than 8 hours a day (figure no. 5);
- For control group: 7 subjects assigned for professional work more than 8 hours a day, 7 subjects assigned for professional work 8 hours a day, 6 subjects assigned for professional work less than 8 hours a day (figure no. 6)

Figure no. 5. Number of hours assigned for professional work (experimental group)

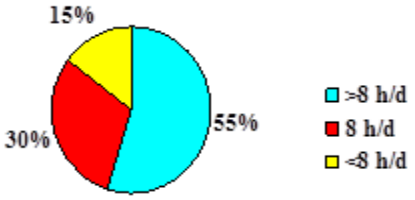
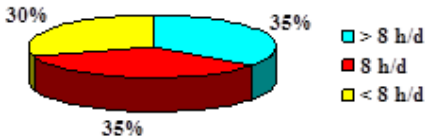


Figure no. 6. Number of hours assigned for professional work (control group)



Evolution of joint mobility

It was performed initially the difference between the value obtained in the final testing and the one obtained in the initial testing for each subject, which represented functional gain for tested characteristic of the subject and subsequently was calculated the average gain for the same functional characteristic for the whole group.

The calculation formula:

Functional gain = final testing - initial testing

Flexion functional gain

The experimental group had an average value of functional gain of 6.9º, with a minimum of 4º and a maximum of 10º, and the control group had an average of functional gain of 4.1º, with a minimum of 3º and a maximum of 6º (table no. 2).

Table no. 2. Descriptive statistical indicators – Flexion functional gain

	Average	Standard Deviation	Minimum	Maximum
Experimental Group	**6,9º**	**2,3**	**4º**	**10º**
Control Group	**4,1º**	**1**	**3º**	**6º**

Extension functional gain

The experimental group showed an average of

functional gain in extension testing of 6.3º, with a minimum of 4º and a maximum of 8º, while the control group had an average of functional gain of 4º, with a minimum of 3º and a maximum of 6º (table no. 3).

Table no. 3. Descriptive statistical indicators – Extension functional gain

	Average	Standard Deviation	Minimum	Maximum
Experimental Group	**6,3º**	**1,5**	**4º**	**8º**
Control Group	**4º**	**1**	**3º**	**6º**

Right lateral tilt functional gain

The experimental group had an average value of functional gain of 6.4º, with a minimum of 3º and a maximum of 10º, and the control group had an average functional gain of 3.5º, with a minimum of 3º and a maximum of 5º (table no. 4).

Table no. 4. Descriptive statistical indicators – Right lateral tilt functional gain.

	Average	Standard Deviation	Minimum	Maximum
Experimental Group	**6,4º**	**2,7**	**3º**	**10º**
Control Group	**3,5º**	**0,7**	**3º**	**5º**

Left lateral tilt functional gain

The experimental group had an average functional gain 9.7º, with a minimum of 4º and a maximum of 20º, and the control group had an average functional gain of 3.5º, with a minimum of 3º and a maximum of 5º (table no. 5).

Table no. 5. Descriptive statistical indicators – Left lateral tilt functional gain

	Average	Standard Deviation	Minimum	Maximum
Experimental Group	**9,7º**	**7**	**4º**	**20º**
Control Group	**3,5º**	**0,7**	**3º**	**5º**

Right rotation functional gain - cervical segment

The experimental groups had a mean functional gain of 32.5º with a minimum of 25º to a maximum 40º, and the control group had an average functional gain of 25.5º, with a minimum of 20º and a maximum of 32º (table no. 6).

Table no. 6. Descriptive statistical indicators – Right rotation functional gain.

	Average	Standard Deviation	Minimum	Maximum
Experimental Group	**32,5º**	**5,7**	**25º**	**40º**
Control Group	**25,5º**	**4,5**	**20º**	**32º**

Left rotation functional gain - cervical segment

The experimental groups had a mean functional gain of 32.5º, with a minimum of 25º and a maximum 40º, and the control group had an average functional gain of 24.2º, with a minimum of 20º and a maximum of 32º (table no. 7).

Table no. 7. Descriptive statistical indicators – Left rotation functional gain.

	Average	Standard Deviation	Minimum	Maximum
Experimental Group	**32,5º**	**5,8**	**25º**	**40º**
Control Group	**24,2º**	**4,8**	**20º**	**32º**

Comparative analysis of the average gains of the two groups revealed that the experimental group had a better outcome for all measurements regarding *functional gain for cervical segment.*

DISCUSSIONS

Within this interesting study, are brought into discussion the following issues:

- By creating and adapting the content of kinetic program to subjects' possibilities, was obtained an improvement in joint mobility as proven by statistically significant quantitative and qualitative bounce recorded in the experimental group, which are verifying the assumption from the beginning of the study.
- By focusing kinetic intervention procedures on involved muscles and correlation with evaluating tests of the quality and efficiency of interventional process, is actually demonstrate an improvement of all functional parameters for the experimental group and the quality of life of these subjects, which are verifying the assumption from the second part of the study.

CONCLUSIONS

Poor management of working position in the professional activity from dental laboratories entails the development of pathology by musculo-osteo-articular overloading, pathology whose symptoms will gradually intensify without a proper treatment on right time, and could finally get to reduced work capacities or even stop working. Physical exercise programs carried out regularly by dental technicians prevents some diseases caused by stress produced in wrong working positions. Education and regular physical activities of dental technicians will help to primary prevention of cervical painful syndromes.

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