Cervical postures and electromyographic activities of related neck muscles when using a neck support pillow

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INTRODUCTION

Researches has been studied about the comfort, and neck muscles activities when using different shapes, materials. [1-2] However, neck muscle activities in a time series when using different pillows had not been examined. Therefore, the purpose of this study is to examine the changes of neck muscle activities when using different pillows in a time series and different kinds of pillow.

METHODS

Thirty young volunteers without neck disability were recruited and Each participant used was investigated for neck muscle activities in sitting and supine position for 30 minutes with three conditions with a neck support pillow, a standard pillow, and without using pillow by a random order. Electromyography (EMG) of sternocleidomastoid (SCM) and upper trapezius (UT) were collected with an interval of three-minutes. EMG was demonstrated as ratio of relative changes from sitting to supine position to that occurred in the position upright position. The craniocervical postures were collected by universal goniometer. Statistical analysis were examined by SPSS for Windows (version 10.0).

RESULTS AND DISCUSSION

There was a significant decrease of SCM activity after the ninth minutes up to the 20th minutes when lying down from a upright position and different conditions of using pillows (p<0.05), yet not happened to the UT. (Figure 1.) The craniocervical flexion angles in sagittal plane were significant differences between different conditions of using pillows. (Table 1.)

Craniocervical postures in sagittal plane were affected by different conditions of using pillows, and those in frontal plane was influenced by a time factor as well as the interaction with pillow factors. (p<0.05)

Both activities of anterior (SCM) and posterior (UT) neck muscles decreased when changing craniocervical postures and different conditions of using pillows, showing a muscle relaxation effect. This results confirm that why most participants preferred proper neck support [1]. A neck support pillow would provide more neck flexion and stable postures in a supine position.

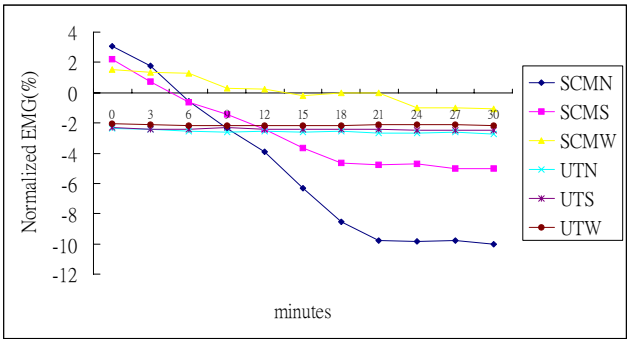

Figure 1: The neck muscle activities were based on the three kinds of pillow. SCM:sternocleidomatoidus; UT: upper trapeizius; N: neck support pillow; S: standard pillow; W: without pillow.

CONCLUSIONS

The neck muscle activities of SCM was decreased mostly when using neck support pillow and been a relaxation condition. The condition without pillows would cause a unstable postures and keep SCM activated to maintain craniopostures. The neck muscle activities of trapezius both had not changed within 30 minutes in supine position no matter what conditions with pillows or not were used.

REFERENCES

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Table 1: The craniocervical angle for subjects when used different kinds of pillow.

	Sagittal plane			**Frontal plane**			**Transverse plane**		
Source	P	T	P*T	P	T	P*T	P	T	P*T
F	458.41	0.84	0.219	0.642	4.889	2.871	0.76	0.637	0.181
p	0.000*	0.437	0.927	0.53	0.011*	0.026*	0.472	0.533	0.948

* indicating P<0.05