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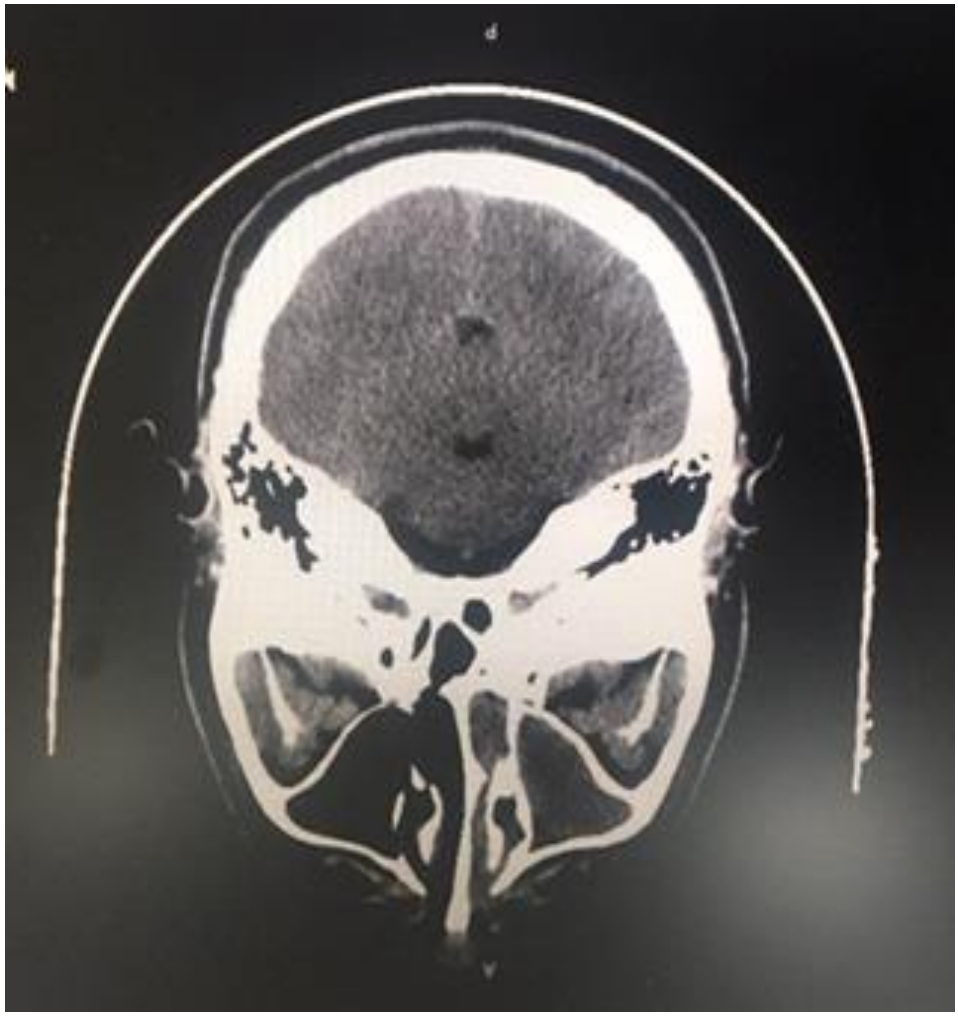

- **Thoracoabdominal asynchrony correlates with peripheral vascular resistance changes in a cohort of obese children.**
- **Effect of Breathing Exercises on Fatigue Dimensions in Patients with COPD**
- **A rare cause of ptosis in emergency medicine practice: acute sinusitis case report**

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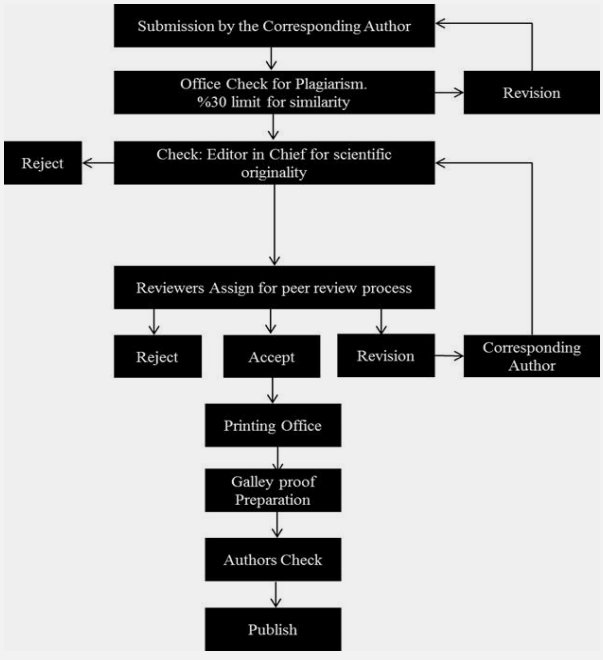

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Thoracoabdominal asynchrony correlates with peripheral vascular resistance changes in a cohort of obese children

Marco Zaffanello[1]*, Franco Antoniazzi[1], Laura Tenero[1], Michele Piazza[1], Angelo Pietrobelli[1], Giuseppe Lippi[2], Emma Gasperi[1], Giorgio Piacentini[1]

Abstract

Objective: The purpose of this study was to assess the relationship between the thoracoabdominal asynchrony (phase angle), as an index of inspiratory airflow resistance, pulse transit time arousal index (PTT Ar/I), as changes in peripheral vascular resistance and intrathoracic pressure, and obstructive apnea index (OA), Oxygen Desaturation Index (ODI), snoring (% estimated Total Sleep Time - eTST) and apnea-hypopnea index (AHI) in a cohort of exogenous obese children.

Material and Methods: Body mass index (BMI) and BMI z-scores were calculated according to age and sex in 36 consecutive obese children. Nasal patency, tonsil size, Friedman palate position scoring were also recorded. An overnight sleep respiratory recording was performed using an polygraphic ambulatory device.

Results: Subjects studies had normal to mild sleep respiratory involvement (assessed by respiratory polysomnographic scoring). Phase angle correlated significantly with PTT Ar/I, but not with AHI (n/hr), OA (n/hr), ODI (n/hr) and snoring (% eTST), even adjusting for nasal patency, tonsil hypertrophy, palate position and BMI (z-score).

Conclusion: Thoracoabdominal asynchrony (phase angle) is correlated with peripheral vascular resistance changes (PTT Ar/I), suggesting a subclinical upper respiratory airflow anomaly with autonomic activation in obese subjects.

Keywords: Phase angle, Pulse transit time, Obesity, Children, Overnight Respiratory polygraphy.

Introduction

Childhood obesity has an impact on obstructive sleep apnea (OSA). Obesity can result in reduced lung volume and decreased upper airway caliber (1). The prevalence of OSA is significantly higher in obese children, with or without adenotonsillar hypertrophy, compared to non-obese counterparts (2) . In particular, the obesity level remains an important aggravating factor for OSA and reduced pulmonary function (3). Adenoid size is also important in obese children with symptoms of sleep disordered breathing (SDB), due to its strong association with the presence of OSAS (4).

The gold standard for diagnosing OSA is overnight polysomnography (PSG). In addition, a poligraphic device has been reported to be an acceptable and cost-effective alternative to PSN (5, 6). In obese children, home and sleep laboratory overnight PSGs have shown good agreement (7).

Phase angle vector analysis is an index of thoracoabdominal asynchrony (TAA) and inspiratory airflow resistance. An increased value suggests an increased inspiratory work of breathing.

Phase angle vector analysis it is claimed as a useful parameter of impending upper airway obstruction (8). In particular, an increase in inspiratory resistance, as observed during obstructive apnea (OA) and hypopnea (H), produces an asynchrony between rib cage and abdomen (9).

Pulse Transit Time (PTT) is the time taken for the arterial pulse to travel from the heart to the pulse oximeter site (finger or toe). PTT analysis is calculated from the electrocardiogram (ECG) signals and the plethysmographic waveforms from the pulse oximeter (10). PTT has been suggested as a non-invasive index which reflects changes in peripheral vascular resistance and intrathoracic pressure. PTT arousal index (PTT Ar/I) is the frequency (number/hr) of a defined decrease in PTT, which may serve as a marker for respiratory events that occur in patients with OSA (11).

The purpose of this study was to assess the relationship between the TAA (phase angle), as an index of inspiratory airflow resistance, PTT Ar/I, as changes in peripheral vascular resistance and intrathoracic pressure, and AHI in a cohort of 36 obese children without declared respiratory sleep disturbance.

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Material and Method

Study population

A prospective respiratory sleep study was carried out in 36 consecutive obese children referred by pediatricians to our department that specializes in endocrine disorders between June 2014 and June 2015.

Inclusion criteria were exogenous obesity, normal to mild sleep respiratory involvement (according to polysomnographic scoring). Exclusion criteria were: craniofacial abnormalities, chromosomal disorders, lung disease, neuromuscular disorders, central apnea or central hypoventilation, endocrine disorders and genetic diseases related to obesity. Allergy and restless leg syndrome were excluded by interview at admission. None of the studies subjects were involved in any diet restriction program.

Caregivers signed an informed consent document prior to enrollment in the study. The protocol was approved by the Institutional Ethics Committee of Verona.

Anthropometry and clinical scoring

All measurements were taken in the morning after an overnight fast with patients wearing only underwear. Height and weight were measured by skilled personnel using standardized techniques. Body mass index (BMI) and BMI z-scores were calculated according to age and sex (http://nccd.cdc.gov/dnpabmi/Calculator.aspx).

Nasal patency was assessed according to published criteria (12). Unilateral and bilateral nasal obstructions were quoted equally from 0 (unoccluded) to 3 (completely occluded). The tonsils were measured using a grading system from 1 to 4 (13). The palate position was measured using a grading system from 1 to 4 (14).

Overnight respiratory polygraphy

An overnight respiratory polygraphic study was performed using a portable ambulatory device (SOMNOscreenTM PSG, SOMNOmedics GmbH, Randersacker, Germany), with continuous monitoring of nasal airflow, chest and abdominal respiratory movements (thoracic and abdominal belts), arterial oxygen saturation (SaO2; digital pulse oximetry), ECG, body position (mercury sensor) and tracheal sounds (microphone).

The device was applied between 8:00 PM and 08:00 AM with an overnight recording. All subjects lasted for $\geqslant$6 h in a quiet, specifically prepared sleep room.

Analysis of the entire recording was carried out both manually and automatically (DOMINO software, Somnomedics v.2.6.0). The estimated total sleep time (eTST) was calculated according to published criteria, and movement periods were excluded (15).

Respiratory events were scored according to the American Academy of Sleep Medicine guidelines (16). The number of OA plus mixed apneas (M) plus central apneas (CA) and H was divided by hours of eTST (n/hr) and expressed as an index (AHI) (17). Desaturation was considered in the presence of a drop $\geqslant$ 3% in oxygen. The oxygen desaturation index (ODI) was calculated as the total number of desaturations divided by the eTST (n/hr). Snoring (% of eTST) was also recorded.

As an index of inspiratory effort, phase angle is vector of rib cage and abdominal respiratory movements recorded during natural nocturnal active and quiet sleep. Phase angle analysis determined the degree of obstruction calculated from the 2 effort signals (thoracic and abdominal belts).

PTT analysis was calculated from the ECG signals and the plethysmographic waveforms from the pulse oximeter.

Statistical analysis

Statistical analysis was done using SPSS Statistics 19.0 software for Windows. Descriptive statistics (mean, standard error and range) were calculated for the quantitative variables considered in this study. The strength of the association between two variables (snoring versus respiratory variables or versus clinical scoring) was evaluated by calculating simple and partial correlation coefficients, adjusting for clinical scoring when appropriate. Statistical significance was considered for $P<0.05$.

Results

Thirty-six obese children (17 males) were enrolled in the study. Physical characteristics (mean +/- SD) were showed in Table 1. Scoring for nasal obstruction, tonsils hypertrophy and palate position (% in the population study) were calculated and showed in Table 1. Sleep respiratory polysomnographic results are summarized in Table 2.

Correlation coefficients (r) between phase angle (degrees) and respiratory polysomnographic results are shown in Table 2. Phase angle correlated significantly with PTT Ar/I ($P<0.005$), even after adjusting for nasal patency, tonsil hypertrophy, palate position, or BMI (Z-score), but not with AHI and ODI. Figure 1 shows the correlation (mean and 95% C.I.) between phase angle and PTT Ar/I (obese children with AHI > 1.4/hr are shown as non-filled squares.

Table 1: Physical properties of subjects and standards

	Mean +/- SD
Age (year)	11.9+/- 2.6
Weight (kg)	72.6+/-21.7
Height (cm)	154+/-14
BMI z-score	2.17+/-0.28
	Standards %
Scoring for nasal obstruction	0=47.2% 1=13.9% 2=13.9% 3 and 4=25%
Tonsils hypertrophy	1=61.1% 2=27.8% 3=11.1%
Palate position	1=44.4% 2=41.7% 3=8.3% 4=5.6%

Table 2: Correlation analysis between snoring and sleep cardio-respiratory parameters

Dependent variable	Independent variables	Mean+/- SD	R*	p value*
Phase angle (degree)		35.7+/-11.7	-	-
	OA (n/hr)	0.18+/- 0.3	0.080	0.644
	AHI (n/hr)	0.18+/- 0.9	0.129	0.454
	ODI (n/hr)	0.8+/-0.9	0.194	0.386
	Snoring (% eTST)	3.4+/-7.9	0.056	0.745
	PTT Ar/I	74.1+/-18.7	**0.497**	**0.002**

* Similar results were obtained even adjusting (partial correlation analysis) for nasal patency or tonsil hypertrophy, or palate position or BMI (Z-score), and nasal patency & tonsil hypertrophy & palate position, and nasal patency & tonsil hypertrophy & palate position and BMI (Z-score).

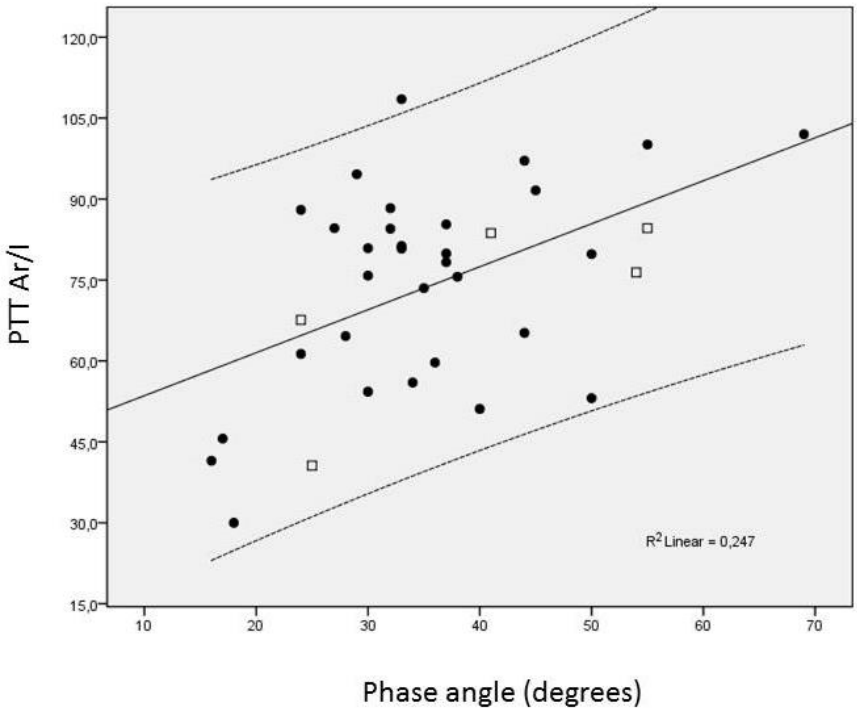

Figure 1: Correlation (mean and 95% C.I.) between phase angle and PTT Ar/I (obese children with AHI > 1.4/hr are shown as non-filled squares).

Discussion

The major finding of the present study was that the TAA (phase angle), as the inspiratory airflow resistance measure, correlated significantly with peripheral vascular resistance changes (PTT Ar/I) (R2=0.25; p<0.005) in our group of obese children with normal to mild AHI (0.8±0.9 events/hr).

A pathophysiological explanation regarding the relationship between phase angle and PTT can be put forward. A compromised upper airway patency leads to an increased inspiratory work of breathing which, on turn, may lead to a change of intrathoracic pressure and TAA (increased phase angle) values. Moreover, the non-invasive PTT index, as an alternative to esophageal manometry, can assess the changes of intrathoracic pressure (17). PTT Ar/I was also found to be elevated in children manifesting episodic subcortical arousals, resulting from obstructive respiratory events compared with children with primary snoring (17). Finally, PTT has been referred as a sensitive parameter of respiratory events (11). Thus, phase angle and PTT Ar/I values are linked to the same compromised upper airway patency.

In our obese patients, the TAA (phase angle) correlated positively with PTT Ar/I. Therefore, phase angle and PTT Ar/I did not correlate with AHI.

They were classified as having normal to mild sleep respiratory involvement. A possible explanation is that we detected an ample subclinical sleep respiratory involvement in our patients, with phase angle and PTT Ar/I as more sensitive markers than AHI.

The prevalence of OSA in obese children is high (37.1%) (18). Notably, enlarged tonsil and adenoid size increases the risk of OSA (19-24). Moreover, obesity itself has been suggested as a risk factor for OSAS (2), in combination with snoring and adenotonsillar hypertrophy (25). Interestingly, obese severity and ethnicity were associated with OSAS, but not with tonsillar size and palate position (26). Obese children with OSA might continue to have breathing difficulties even after adeno-tonsillar surgery, and this was explained by abnormalities of pulmonary mechanics related to obesity that may cause problems of gas exchange during sleep (1). Although larger adenotonsillar enhance the chance of having SDB, it does not predict the severity of AHI, but reflects flow limitation in children with mild to severe OSAS (27). However, minor changes in adenotonsillar dimensions give an equivalent severity of upper airway obstruction. Soft-tissue changes and fat deposition in the upper airways have both been involved in predisposing the upper airways to collapsibility during sleep (28, 29).

In our study involving obese children with normal to mild AHI, the relationship between phase angle and PTT Ar/I was not modified after adjustment for physical parameters, such as tonsil grading, palate position, nails patency and fatness. This may underpin that the individual characteristics of the upper airway morphology in obese children can predispose to their collapsibility during sleep, thus causing changes in upper respiratory airflow and peripheral vascular resistance. However, further studies are necessary in obese children with normal to mild sleep respiratory disturbances having higher sleep TAA and PTT Ar/I to clarify their clinical significance, if this disturbance anticipate the development of further overt sleep respiratory disturbances and cardiovascular problems, and if diet intervention (i.e., weight reduction) is capable to normalize this pattern.

Limitations of the study include: i) Our in-hospital monitoring was done in an unfamiliar environment. ii) We did not evaluate the sleep efficiency but respiratory sleep characteristics; iii) We did not evaluate adenoid size, since this required nasal fibroscopy or radiology. Conversely, the strengths of the study are: i) Obese children referred to our department were not referred because of sleep respiratory problems; ii) The measurements of sleep respiratory patterns were performed instrumentally, but not investigated by interview in an out-patient setting. This gave precise quantitative data; iii) The clinical parameters used are quite affordable in the clinical setting.

Conclusion

In conclusion, we want to emphasize that we investigated the sleep respiratory characteristics of exogenous obese children unselected for reporting respiratory sleep problems. TAA (phase angle) and related peripheral vascular resistance changes (PTT Ar/I) can detect a subclinical upper respiratory airflow anomaly with autonomic activation in some obese patients at enhanced risk for respiratory sleep problems. Further longitudinal studies may be able to uncover the clinical significance and consequences of early intervention aimed at reducing fatness to achieve normalization of the respiratory pattern herein reported.

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Ethical issues: All Authors declare, Originality and ethical approval of research, and responsibilities of research, responsibilities against local ethics commission are under the Authors responsibilities. The study was conducted under defined rules by the Local Ethics Commission guidelines and audits.

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Effect of Breathing Exercises on Fatigue Dimensions in Patients with COPD

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Abstract

Objective: Fatigue is known as an important and multidimensional symptom in patients with chronic obstructive pulmonary disease (COPD). Pulmonary Rehabilitation (PR) is one of the effective ways to reduce fatigue and improve the quality of life in patients with COPD. However, equal recovery to all dimensions of fatigue is unclear after the rehabilitation program. This study aims to determine the effect of breathing exercises on the fatigue dimensions in patients with COPD

Method: This study aimed to determine the effect of breathing exercises on fatigue dimensions in patients with COPD. The population in this clinical-trial research included 70 COPD patients who had been hospitalized in the Thorax Ward of Razi Hospital in Rasht. The samples were divided into two groups of 35 subjects, by which the control group was tried to be in a separate room from the experimental group. The experimental group participated in the breathing exercises program where the patients were asked to perform their respiratory exercises 4 times a day for 10 days. The control group received the routine care. Dimensions of fatigue (physical, general, mental, reduced activity, and reduced motivation) were measured and compared in both groups. SPSS (version 21) was used to analyze the data and descriptive and inferential tests were used.

Results: There were significant statistical improvements in mean score of fatigue dimensions after breathing exercises, general fatigue ($p=0.0001$), physical exhaustion ($p=0.0001$), reduced activity ($p=0.0001$) and reduced motivation ($p=0.0001$), but there was no significant difference in mental fatigue. Predictors of changes in total fatigue score, breathing exercises ($p<0.0001$) and Salbutamol spray ($p<0.013$) were considered as two factors affecting fatigue score changes in multiple analysis.

Conclusion: According to the obtained findings, breathing exercises are effective in many dimensions of fatigue as a non-pharmacological, low-cost, and safe method in care-and-treatment process in patients with COPD, but their effect on mental fatigue, as an important dimension, requires different plans and designs in doing breathing exercises.

Keywords: Chronic obstructive pulmonary disease, Fatigue, Breathing exercises

Introduction

Chronic obstructive pulmonary disease (COPD) is one of the most common chronic diseases (1). The Global Institute for Chronic Obstructive Lung Disease (GOLD) estimates that by 2020, COPD will have ranked third among the world's sixth most common causes of death and will have been the fifth disabling disease (2,3). Two important symptoms in patients with COPD, which are also among the common complaints, are shortness of breath (dyspnea) and fatigue (3-5). Fatigue is an important and multi-dimensional symptom in patients with COPD (6,7). Fatigue impedes the fulfillment of individual and social roles and has a significant negative effect on the economic status and quality of life of affected people as well (2). Fatigue is experienced by approximately 43-58 percent of people with COPD (3). There is also a strong correlation between fatigue and conditions such as anxiety, petulance, depression, and sleep quality (8). Fatigue is a multidimensional concept, understanding different aspects of fatigue will help nurses for better planning and implementation of strategies to relieve fatigue in patients. (7). Today, pulmonary rehabilitation (PR) is developed as a non-pharmacological approach focusing on the needs of patients and their families. PR aims to help patients achieve independence and maintain the maximum level of autonomy and function in society (9,10). Breathing exercises are important parts of pulmonary rehabilitation, which can improve airway function and increase respiratory function (11). Breathing exercises in patients with COPD, such as pursed-lip breathing (PLB) and diaphragmatic breathing (DB), aim to improve respiratory pattern through reducing respiratory rates (12). The study conducted by Zakerimoghadam et al. (2006) showed that doing breathing exercises was effective in reducing fatigue in patients with COPD (4). Izadi Avanji et al. (2006), in the same vein, demonstrated that pursed-lip breathing (PLB) exercises improved pulmonary function, arterial blood gases, and increased the daily life activities (13).

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A study by Lewko et al. (2014) in London also revealed that low levels of activities as well as general and physical fatigue all improved seven weeks after a rehabilitation program, whereas there was no significant difference in reduced motivation or mental fatigue after this period (6). Although fatigue is an inevitable phenomenon in patients with COPD, health-care providers, unfortunately, pay little heed to fatigue and its rate when examining clinical symptoms of patients with COPD (1,7). Therefore, in order to reduce costs and manpower and to promote health, and since nurses spend more time with patients, it is necessary to focus on non-pharmacological, low-cost and non-invasive methods as an effective way to reduce the level of fatigue, thereby improving the level of health and quality of life for these patients (3). This study aims to determine the effect of breathing exercises on the fatigue dimensions in patients with COPD.

Materials and Methods

In this clinical trial study, the subspecialized pulmonology ward of Razi Hospital in Rasht was selected as the research environment. The study population included all COPD patients hospitalized in the pulmonology ward (Razi hospital) from 22/05/2015 to 14/11/2015. Sample size, with a confidence coefficient of 95% and a test power of 95% using Zakeri Moghaddam et al.'s findings (4), was determined so that there were 29 subjects in each group, and finally, considering the probability of drop-outs, 35 individuals were considered for each group. The inclusion criteria for the study were: definite diagnosis of COPD by a physician; having no underlying illness (unstable angina, uncontrolled cardiac arrhythmia, uncontrolled hypertension); having no known defect in the respiratory system caused by other diseases other than COPD; not using fatigue reducers such as Amantadine; ability to speak Farsi; and being in the 2nd or 3rd stage of the disease based on GOLD classification. The exclusion criteria were: not doing recommended exercises; It should be noted that two patients in the control group and two patients in the experimental group died and one in the experimental group was excluded due to lack of cooperation. Data were collected using a questionnaire (demographic and disease-related data) and Multi-dimensional Fatigue Inventory (MFI). The MFI includes five distinct dimensions including general fatigue, physical fatigue, mental fatigue, reduced activity and reduced motivation. Each dimension consists of four questions and answers are collected in a 5-point scale. Therefore, the total score for each dimension will be between 4-20 and the total fatigue score which is determined by the sum scores of dimensions will fall between 20-100 where a higher score will indicate severer fatigue. The validity and reliability of this questionnaire have been set out in English (14,15). To assess the reliability of the questionnaire was completed within 15 days by 20 patients in two stages. The correlation coefficient between two stages Cronbach's alpha coefficient was used to determine the internal consistency of fatigue dimensions instrumentation. The obtained Cronbach's Alpha coefficient (α= 0.756) means that the questions on fatigue dimensions instrumentation have a reliable internal

consistency to determine the fatigue.

Procedure: due to the fact that the patients were hospitalized in both control and experimental groups, random sampling was not possible. Patients in the control group were placed in a separate room from the patients in the experimental group so as not to have them observe the exercises done by the experimental group. Rooms for experimental and control groups were selected arbitrarily. Data collection was done in both groups before and after intervention by the researcher's colleague who was not aware of the groups. A checklist containing demographic and disease-related data was completed for both groups. Moreover, the MFI was also completed by a questioner prevent probable bias once before intervention for both experimental and control groups. The researcher followed the breathing exercises for 10 days and then the multidimensional fatigue inventory was completed in both experimental and control groups again. The control group received routine cares while the experimental group received routine cares and took part in breathing exercises program

Patients hospitalized at subspecialized pulmonology ward of Razi Hospital in Rasht were taught breathing techniques for 30 minutes face-to-face training and they were given a training booklet. The breathing exercises done by the patients were then monitored and corrected by the researcher. In adopting effective breathing techniques, patients were taught how to use their breaths in PLB and DB and how to cough efectively. Patients did the abovementioned exercises 4 times a day (not doing breathing exercises received a zero score and the maximum amount of doing them received four scores) each time for 15 minutes over 10 days. The researcher monitored breathing exercises every time as long as the patients were hospitalized. After being discharged from the hospital, the MFI was completed by the questioner.

Statistical Analyzes

Data analysis was carried out using descriptive and analytical statistics (multivariate regression, paired t-test, independent t-test, Pearson correlation coefficient) in SPSS version 21 at a significance level of $P<0.05$.

Results

Thirty-six obese children (17 males) were enrolled in the study. Physical characteristics (mean +/- SD) were showed in Table 1. Scoring for nasal obstruction, tonsils hypertrophy and palate position (% in the population study) were calculated and showed in Table 1. Sleep respiratory polysomnographic results are summarized in Table 2.

Correlation coefficients (r) between phase angle (degrees) and respiratory polysomnographic results are shown in Table 2. Phase angle correlated significantly with PTT Ar/I ($P<0.005$), even after adjusting for nasal patency, tonsil hypertrophy, palate position, or BMI (Z-score), but not with AHI and ODI. Figure 1 shows the correlation (mean and 95% C.I.) between phase angle and PTT Ar/I (obese children with AHI > 1.4/hr are shown as non-filled squares.

Table 1: Frequency Distribution of Demographic and Disease-related Data in Patients with COPD in Experimental and Control Group

Variables			Groups		P
			Control	Experimental	
Age (Year)		Mean ± SD	72.10±77.67	68.11±23.15	**[1]0.086
Gender		Female	5(14.3)	8(22.9)	**[2]0.356
		Male	30(85.7)	27(77.1)	
Education		Illiterate	26(74.3)	20(57.1)	*0.275
		>Diploma	8(22.9)	12(34.3)	
		Diploma	1(2.9)	3(8.6)	
Career		Unemployed	0(0)	1(2.9)	*0.569
		Housewife/husband	2(5.7)	5(14.3)	
		Retired	8(22.9)	6(17.1)	
		Self-employed	9(25.7)	10(28.6)	
		Farmer	16(45.7)	13(37.1)	
Residency		City	20(57.1)	17(48.6)	*0.473
		Village	15(42.9)	18(51.4)	
Smoking (cigarette)		Yes	27(77.1)	30(85.7)	*0.356
		No	8(22.9)	5(14.3)	
Smoking withdrawal Time (Year)		Does’nt consume cigarettes	8(22.9)	5(14.3)	*0.063
		Has not quitted	13(37.1)	7(20)	
		>5	6(17.1)	14(40)	
		5-15	6(17.2)	3(8.6)	
		15<	2(5.7)	6(17.1)	
(cigarette) Cumulative consumption (pack/ year)		Mean ± SD	44.43±03.86	50.46±34.87	**0.563
History of other diseases	**Diabetes**	Yes	7(20)	6(17.1)	*0.759
		No	28(80)	29(82.9)	
	Hyperlipidemia	Yes	4(11.4)	6(17.1)	0.495*
		No	31(88.6)	29(82.9)	
	Blood pressure	Yes	18(51.4)	15(42.9)	0.473*
		No	17(48.6)	20(57.1)	
	Heart disease	Yes	8(22.9)	11(31.4)	0.42*
		No	27(77.1)	24(68.6)	
Number of hospitalization in the hospital		No hospitalization	1(2.9)	0(0)	0.478*
		Less than 3 times	10(28.6)	13(37.1)	
		More than 3 times	24(68.6)	22(62.9)	

**Chi2*
***t-test*

The findings also showed that there was no statistical difference in control group before and after intervention regarding mean and standard deviation as well as changes in mean score of fatigue dimensions (general fatigue, physical exhaustion, reduced activity, reduced motivation, mental fatigue, and total fatigue score). But there was a significant difference (P=0.0001) in the experimental group before and after intervention regarding mean and standard deviation as well as changes in mean score of fatigue dimensions except mental fatigue (Figure 1, Table 2).

In Table 3 and figure 2, which compare mean changes in total fatigue score in terms of breathing exercises, it can be seen that there is a significant and inverse statistical difference between (doing) breathing exercises and changes in the total fatigue score, i.e. the more breathing exercises are used, the lower the fatigue score will be. So, the highest score of fatigue reduction was observed in experimental group with regular breathing exercises, experimental group with irregular breathing exercises, and control group who did not do the exercises at all.

Table 4, which indicates the regression coefficients of the predictive factors for changes in the total fatigue score with individual, social, and disease-related variables, shows that from among individual, social, and disease-related variables, breathing exercises and Salbutamol spray were respectively the strongest and the second effective factors in the changes in the total fatigue score.

Table 2: Comparison of Mean and Standard Deviation and Changes in the Mean Scores of all Fatigue Dimensions in Control and Experimental Groups before and after Intervention (Int.)

Variable	Control group			Experimental group			P
	Mean ± SD (Before Int.)	Mean ± SD (After Int.)	Mean Changes	Mean ± SD (Before Int.)	Mean ± SD (After Int.)	Mean Changes	
General fatigue	15.3±76.12	15.88±2.68	-0.12	15.3±78.08	53.9 ±2.78	6.25	0.0001
Physical fatigue	17.1±76.85	1±18.7	-0.24	17.47±83.1	12.2±22.88	5.25	0.0001
Reduced activity	17.3±39.20	27.18±1.79	-0.88	17.09±1.94	4±11.66	6.09	0.0001
Reduced motivation	12.2±7.22	13.2±27.74	-0.58	10.97±2.78	34.8±2.54	2.63	0.0001
Mental fatigue	9.15±4.48	8.4±73.78	0.42	7.3±56.78	6.3±44.78	1.13	0.253
Total fatigue	72.76±11.01	74.8±15.48	-1.39	68.7±88.84	47.10±53.98	21.34	0.0001

Table 1: Comparison of Mean Changes in Total Fatigue Score Based on the Status of Breathing Exercises

Group	Variable	Frequency	Mean	SD	P
Experimental	Irregular	18	19.72	8.24	0.0001
	Regular	14	23.43	10.66	
Control		33	-1.39	8.76	
Sum total		65	9.8	14.57	

Table 2: Estimation of regression coefficients of predictors of changes in total fatigue score in patients with COPD

Variable	Non-standard coefficients		Standard coefficients	T	P	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Bottom line	Upper line
Constant value	-37.763	5.317		-7.102	0.0001	-48.388	-27.138
breathing exercises	34.409	3.378	0.789	10.185	0.0001	27.658	41.160
Constant Value	-42.871	5.48		-7.823	0.0001	-53.826	-31.916
breathing exercises	33.963	3.245	0.779	10.466	0.0001	27.476	40.45
Salbutamol spray	8.728	3.249	0.189	2.546	0.013	1.874	15.581

Discussion

The present study showed that the MFI mean scores before intervention in both control and experimental groups were the highest in terms of physical exhaustion, reduced activity, general fatigue, reduced motivation, and mental fatigue, respectively. Thus, physical exhaustion and mental fatigue had the highest and the lowest mean scores in both groups, respectively. The results of Wong et al.'s (2010) research also revealed that almost all patients with COPD had a high level of physical exhaustion (95.3%), reduced activity (88.1%), reduced motivation (83.3%), mental fatigue (69.9%) and general fatigue (54.5%) (8). Baghai-Ravary et al. (2009) by the same token demonstrated that patients with COPD suffered from fatigue more than healthy subjects in the study (16). Peters et al., (2011) also found that 50% of patients with chronic obstructive pulmonary disease suffered from fatigue, and these patients were more restricted in many aspects of their health, quality of life, and performance (17). Theander (2004), also showed that fatigue was a common symptom in patients with COPD which affected patients' performance and needed to be investigated and professionally intervened (18). Doing breathing exercises as a non-pharmacological, low-cost, and safe method in care-and-treatment process of patients with COPD could significantly improve fatigue (general fatigue, physical fatigue, reduced activity, and reduced motivation) except mental fatigue in the experimental group compared to the control group. In this regard, according to Lewko et al.'s (2014) study, only 23 patients demonstrated significant reduction in 'reduced activity, general fatigue, and physical fatigue' by completing the rehab program, but there was no reduction in the scores of 'mental fatigue and reduced motivation'. The fact that breathing exercises did not have any effects on mental fatigue in the current study could be due to the type of the proposed program and the lack of a long-term follow-up. Perhaps sessions on cognitive therapy and management of depression along with breathing exercises can affect mental fatigue in these patients. Lacasse et al. (2007) showed a significant reduction in fatigue scores after a rehabilitation program (19).

The results of this study showed that the reduction in COPD patients' fatigue scores was due to their breathing pattern change. There was a significant and inverse statistical difference between (doing) breathing exercises and changes in the total fatigue score, i.e. the more breathing exercises were used, the lower the fatigue score would be. These patients can use effective breathing patterns (DB, PLB, and effective cough) rather than ineffective ones to control and improve the disease symptoms and therefore increase their quality of life. The study conducted by Deng et al. (2013) revealed that after carrying out pulmonary rehabilitation program, there was a significant decrease in the total fatigue score as well as the mean scores of fatigue dimensions in the experimental group compared with the control group (5).

The results of Zakerimoghadam's (2006) study indicated that there was a significant difference between the experimental and control groups after the intervention in terms of severity of fatigue (4).

. In this regard, Lewko et al. (2009) conducted a study on physiological and psychological predictors of fatigue in patients with COPD. The results indicated that general fatigue predictors included depression and reduced arterial oxygen saturation. Physiological fatigue predictors included depression and age. The predictors of reduced activity included depression. Reduced motivation predictors included shortness of breath, depression, and reduced arterial oxygen saturation, and predictors of mental fatigue included depression and reduced arterial oxygen saturation (20).

Conclusion

Considering care-and-treatment process of patients with COPD, the findings of this study showed that doing breathing exercises as a non-pharmacological, low-cost, and safe method could significantly improve fatigue, except mental fatigue, in patients in the experimental group (compared to the patients in the control group). The impact of breathing exercises on mental fatigue, as an important dimension, needs different designs in doing such exercises.

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Ethical issues: All Authors declare, Originality of research, and responsibilities against local ethics commission are under the Authors responsibilities.
Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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Is tubal ligation effective on sexual dysfunction?

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Abstract

Objective: Commonly used methods for preventing pregnancy in Turkey are withdrawal (30%), intrauterine device (27.2%), tube ligation (16.7%), condom (15.2), injection (8.9%), and combined oral contraceptive (1.9%). Protection from pregnancy is one of the most important factors affecting women's health. One of the preferred methods to protect against pregnancy is the 16.7% choice of tube ligation. Tube ligation is used as a contraceptive method but this method has some undesirable consequences. Our aim in this study is to investigate whether tubal ligation has effect on sexually dysfunctional and it is related to the process.

Material method: We included in our study 161 patients using tubal ligation and 77 non-prevention methods. We recorded the demographic characteristics of these patients. We applied the fsfi scale. This questionnaire is a scale of sexual function assessment consisting of 19 questions evaluating sexual functions.

Result: We did not find any difference in the total fsfi (female sexual function index) score between the patients who underwent tubal ligation and those who did not. However, we found a significant decrease in sexual desire and satisfaction in the tubal ligation group. In the subgroup analyzes of the fsfi score, results indicate that the correlation bonds with the subgroups of the tubal ligation group was deteriorated.

Conclusion: Tubal ligation is a preferred method for contraception target, and various studies related to the effects on health have been made. Also, this study determined that tubal ligation has no effect on total fsfi scores. However, subgroup work seemed to have an effect on demand and satisfaction. In addition all, the duration of tubal ligation didn't have any effect on sexual function.

Keywords: Tubal ligation, FSFI, sexual dysfunction

Introduction

Tubal ligation is a surgical contraceptive method requested by the pairs who have completed the number of children and applied by doctors. Sexual dysfunction is used with the intention to define low desire level, orgasmic strength, decreased arousal and dyspareunia. Sexual dysfunction is also related to the problems of biological, psychological, and interpersonal relationships, and it is difficult to distinguish source of the problem. Problem has anatomical, physiological, medical, psychiatric and social components (1,2,3). Therefore, it is difficult to distinguish (4). Psychological factors include previous sexual trauma and previous physical or sexual abuse, sexual neurosis or financial problems, family or occupational problems, as well as familial disease, death, depression and interpersonal problems. Biological factors may be related to a number of causes, such as past surgical history, vascular diseases, recurrent urinary tract infections, endometriosis, sexually transmitted diseases, abnormal hormonal conditions (5,6). Sexual dysfunction is a high-rate phenomenon involving women of all ages who have been exposed in many community-based studies. Sexual dysfunction ranges between 22-93% in different age populations (7,8,9,10).

In a study of 4576 patients with tubal ligation, 80% of women post-tubal ligation couldn't be detected sexual reluctance. Conversely, those who said that there was a consistent change in these patients reported positive impact. Adverse effects were reported in women who felt regret after tubal ligation (11). Berman and colleagues have noted that sexual dysfunction is increasing with age (12). However, it is suggested that the prevalence of sexual dysfunction is also very high among young women (13).

The American Association of Urological Diseases organized a meeting in 1998 to make an international definition and classification of sexual dysfunction in women. This meeting was classified as female sexual dysfunction, sexual desire disorder, sexual arousal disorder, orgasmic disorders and painful sexual intercourse disorders (14).

Recently, the International Consensus Development Conference on Female Sexual Dysfunctions (Definitions and Classifications) has been organized to develop a new classification for sexual dysfunction regardless of etiology.

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This panel divides into four separate categories that can be categorized as ICD 10 (international clasification of dissease) as sexual dysfunction desire disorders, arousal disorders, orgasmic disorders and sexual pain disorders (14). In our study, the research is primarily planned about the category of desire disorders. FSFI (female sexual function index) scale was used to provide standardization of the planned study work on the patients entering this category and to obtain an objective result. We applied to the Turkish version of the FSFI scoring system used to assess sexual function. The adopted Turkish version of this scoring system is reliable. The FSFI scale consists of 19 items evaluating sexual functions to assess key dimensions of short, multidimensional and sexual functioning. Scoring scores were created by evaluating sexual activity in the last 4 weeks. This scoring system is a scoring system that evaluates sexual desire, arousal, lumbarization, orgasm, satiety and pain. (15, 16, 17, 18, 19).

Material and Method

Study population

We have included 161 tubal ligation patients who have applied to the gynecology pollinator of the Amasya University Sabuncuoğlu Şerefeddin Training and Research Hospital and who have chosen tubal ligation as the contraceptive method and 77 have chosen a preservation method other than this. We recorded the data that the FSFI scale was composed of 19 questions and evaluated sexual function in addition to data such as height, weight, age, smoking, chronic illness, occupation, number of children, duration of tubal ligation, menstrual cycle period, marriage duration and meeting type. Sexual desire, arousal, lumbarization, orgasm, satisfaction and pain were assessed by FSFI sexual function scale.

Statistical analysis

GraphPad Prism version 6.00 (GraphPad Software, La Jolla California USA) was used for statistical analysis of collected data. Sociodemographic correlations with tubal ligation were assessed using chi-square analyzes. A t-test (Mann-Whitney U test) was calculated to assess general sexual and / or sexual health status in women with or without tube ligation. Pearson analysis was performed for correlation analysis. If r <0.2, there was no correlation between weak and weak correlations, weak correlation between 0.2-0.4, moderate severe correlation between 0.4-0.6, high correlation between 0.6-0.8 and 0.8> was commented. The results were evaluated in a confidence interval of 95% and a significance level of p <0.05.

Results

A comparison of some sociodemographic and sexual functions in untreated and untreated subjects was shown in Table 1. There was a significant difference between demographic data of patients with tubal ligation and patients without tubal ligation in terms of desire and satisfaction. There was a statistically significant decrease in demand and satisfaction in patients with tubal ligation. However, there was no difference in arousal, lubrication, orgasm, pain and total scores. Distribution of some sociodemographic and sexual functions among the groups was shown in Table 2 by chi-square test. It was found that the preference rate of tubal ligation was significantly higher in housewives than that of women working in outside.

Correlation analysis between some parameters in tubal ligated and untreated subjects was shown in Table 3 and Table 4. When the correlation analysis between the parameters we used in the total evaluation of sexual functions was evaluated in tubal ligation individuals, there was a significant correlation between orgasm and lubricationlubrication and between satisfaction and arousal.

There was no relationship between tubal ligation duration and sexual desire and other parameters on the sexual function parameters of tubal ligation. However, in patients without tubal ligation, a correlation in moderate and high rates was found between lubrication and stimulation, between the orgasm and desire, stimulation and lubrication, between satisfaction and cravings, between arousal, lubrication and orgasm, between pain and lubrication.

In this study, we show that the tubal ligation and the components related to the correlations at individual levels of each of the sexual function scale contents of patients are disrupted by tubal ligation.

We found that the positive correlations between the 5 different components of the FSFI scale between tubal ligation patients and normal individuals were impaired.

Table 1: Comparison of some sociodemographic and sexual functions in subjects with and without tube ligation.

	Tube ligation applied (n=161)	Tube ligation not applied (n=77)	p-value
Age	35,51 ± 0,41	34 ± 0,75	> 0,1673
Height	162,4 ± 0,47	161,8 ± 0,72	> 0,4064
Weight	68,45 ± 0,78	66,43 ± 1,02	> 0,1673
Number of children	3,01 ± 0,28	1,39 ± 0,09	< 0,0001
Marriage duration	15,32 ± 0,39	10,55 ± 0,77	< 0,0001
Desire	3,95 ± 0,12	3,68 ± 0,11	< 0,0033
Arousal	4,08 ± 0,06	4,11 ± 0,12	> 0,7333
Lubrication	4,28 ± 0,05	4,19 ± 0,10	> 0,4720
Orgasm	4,47 ± 0,07	4,51 ± 0,13	> 0,4778
Satisfaction	4,44 ± 0,9	4,80 ± 0,12	< 0,0430
Pain	4,2 ± 0,11	4,31 ± 0,16	> 0,6200
Score	26,47 ± 0,30	25,70 ± 0,59	> 0,4880

p< 0.05 statistically significant.

Table 2: Distribution of some sociodemographic and sexual functions among the groups.

	Ligated tube (n=161)		Tubeless ligation (n=77)		χ^2	p
Cigarette	n	%	n	%		
yes	105	65,2	49	63,6	0,1317	0,7166
no	56	34,8	29	36,4		
Job	n	%	n	%		
nurse	11	6,8	47	60	122,7	< 0,0001
company employee	1	0,6	13	16,8		
housewive	82	50,9	14	18,1		
the other	67	41,7	4	5,1		
Did you marry with your own choice?	n	%	n	%		
no	9	5,6	4	5,2	0,02179	0,8826
yes	152	94,4	74	94,8		
Marriage Types	n	%	n	%		
The person she met	116	72	56	72,7	0,001691	0,9672
Arranged by others	45	28	22	27,3		
Mensturatiın Period	n	%	n	%		
regular	136	84,4	62	80,5	1,025	0,5991
irregular	16	9,9	11	13,2		
already irregular	9	5,7	5	6,3		

p< 0.05 Statistically significant.

Table 3: Correlation analysis between some parameters in tube ligation individuals

Parameters	Tube Ligation Time	Arousal	Lubrication	Orgasm	Satisfaction	Pain	Marriage duration	Total score
Tube Ligation Time	1							
Arousal	0,037*	1						
Lubrication	0,041*	0,183*	1					
Orgasm	-0,005*	0,268**	0,519***	1				
Satisfaction	0,036*	0,407***	0,2847**	0,807#	1			
Pain	-0,029*	0,100*	0,0015*	-0,013*	0,063*	1		
Marriage duration	0,7964&	-0,020*	0,0036*	-0,040*	-0,044*	0,061*	1	
Total score	-0,067*	-0,056*	0,156*	-0,019*	-0,109*	0,193*	-0,109*	1

*None or very weak, **weak, *** moderate, high &, refers to the very high correlation

Table 4: Correlation analysis between some parameters in untube-lived individuals

Parameters	Desire	Arousal	Lubrication	Orgasm	Satisfaction	Pain
Desire	1					
Arousal	0,622&	1				
Lubrication	0,401***	0,603&	1			
Orgasm	0,530***	0,777&	0,649&	1		
Satisfaction	0,501***	0,712&	0,481***	0,713&	1	
Pain	0,279**	0,437	0,415***	0,502***	0,327**	1

*None or very weak, **weak,*** moderate, high &, refers to the very high correlation.

Discussion

In a study conducted in 2008, sexual desire scores of patients who underwent tubal ligation and infertile couples were evaluated, and they concluded that these groups were similar in terms of sexual desire and dysfunction (20). Gülüm and colleagues showed that the sexual function was decreased significantly by the tubal ligation in a study which conducted on 153 patients at 2010 (21). Visvanathan and his colleagues also reported that tubal ligation is associated with increased menstrual cycle and menopausal symptoms as well as depressive symptoms, and increased menopausal cardiovascular disease, coronary heart disease, diabetes and osteoporosis (22).

Conclusion

In our study, no statistically significant difference was found in the total scores between the results of the FSFI sexual function test and tubal ligation procedures. However, when individual components were evaluated, a statistically significant reduction in demand and satisfaction was found. When the process-dependent effect of sexual dysfunction was assessed, it was observed that this condition did not make a cumulative change in sexual desire when the duration of tubal ligation was prolonged.

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A rare cause of ptosis in emergency medicine practice: acute sinusitis case report

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Abstract

Objective: Paranasal sinus infections are one of the most frequent causes of emergency service admissions. With increased incidence, complications are often local and classified according to the effecting side. Early identification of complication leads to reduce mortality and morbidity.

Case: A 22 year old male patient was admitted to our emergency department with ptosis on his right eyelid. Firstly he was admitted to the family doctor and received oral cephalosporin treatment for upper respiratory tract infection. Within three days, the ptosis was progressively occurred. No additional systemic sign was detected. The eyelid has slightly edema, not have redness, conjunctival hyperemia and loss of brow not observed. Eye movements were naturally, display pain in the outward view. For differential diagnosis central nervous system imaging was performed. Patient referred to otorhinolaryngology surgeon with prediagnosis of orbital cellulite and acute sinusitis. The patient was admitted to the otorhinolaryngology clinic for operation because of complicated sinusitis.

Conclusion: In the presence of acute sinusitis, infections may enter the orbital periosteum and spread to neighboring tissues. Computed tomography is a highly effective imaging modality for the evaluation of both paranasal infections and their complications. Patients with orbital complications must be hospitalized and immediate intravenous antibiotic therapy should be started.

Keywords: Paranasal sinus infection, orbital cellulite, ptosis

Introduction

Although paranasal sinus infections are a common group of diseases, complications are rarely occur due to appropriate antibiotic uses. However, it should not be forgotten that individuals who do not receive appropriate treatments may encounter with lethal consequences. Complications of sinusitis are usually classified according to the effecting side as local complications, orbital complications and intracranial complications.

Chandler and Moloney classifications are often used to classify orbital complications of acute sinusitis. According to Chandler's classification, orbital complications can be seen at 5 stages. These stages are classified as preseptal cellulitis (stage 1), orbital cellulitis (stage 2), subperiosteal abscess (stage 3), orbital abscess (stage 4) and cavernous sinus thrombosis (stage 5) according to the severity of the clinical presentation (1, 2).

Periorbital cellulite is often limited to orbital edema, eyelid edema, but deterioration of visual acuity is not expected. When the orbital cellulitis progresses, the orbital adipose tissue is affected by inflammation and resulted with proptosis, chemosis and visual acuity.

The subperiosteal abscess is characterized by inflammatory collection between periorbital tissue and bone tissue and is the most common orbital complication. The patient was often systemically affected and the eye moved outwardly on the eye examination. When abscess formation developed, the intraocular pressure increases and this can result in loss of perfusion of the optic nerve and retina, which is responsible for visual loss. Orbital abscess usually occurs after orbital cellulitis. Exophthalmia, chemosis, ophthalmoplegia are the expected findings (2, 3).

Eye findings often help in the diagnostic process of ptosis. Differential diagnosis in ptosis cases begins with history in order to understand the difference of congenital and acquired ptosis. The medical history and accompanying symptoms in the newly developed ptosis are significant in terms of diagnosis. Ptosis is often classified as neurogenic, myogenic, traumatic, mechanical and pseudoptosis. Myogenic causes such as myasthenia gravis are mainly considered in the case of ptosis in emergency medicine practice. Rapid recognition and treatment of infectious causes in these cases is vital to prevent long-term sequelae .We aimed to discuss the complications of sinusitis presented with ptosis by the help of literature.

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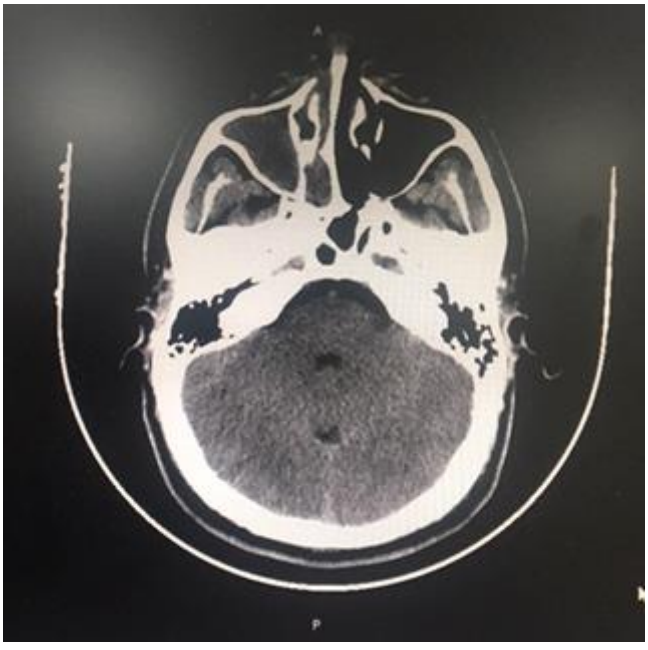
Case

A 22 years old male patient was admitted to our emergency department with ptosis on his right eyelid. There is no past medical history. He was admitted to the family doctor 3 days before the onset and received oral cephalosporin treatment for upper respiratory tract infection. Headache and fever have been observed but relieved after antibiotics. In three days ptosis progressively occurred and he admitted to emergency department for this reason. The overall situation was good, there is no loss of consciousness and orientation. Neck stiffness was negative and there was no motor or sense lateralization. Pathological reflex was not detected.

In physical examination oropharynx was hyperemic postnasal flow is present. No additional systemic sign was detected. There was > 2 mm ptosis in right eye. The eyelid is slightly edema, no redness. Conjunctival hyperemia and loss of brow not observed. Light reflex was positive and not anisocoria. Eye movements naturally, displayed pain in the outward view. Vital signs were stable, fever was 36, 5°. After initial examination blood tests were performed. Leukocyte counts were 13.900 /ml, sedimentation was 34% and CRP was 4.42 mg/l in laboratory tests.

No features were detected in routine biochemical examinations. For differential diagnosis central nervous system imaging was performed. Brain computed tomography was also detected in the loss of the right maxillary and ethmoid sinus ventilation (Figure 1). Diffusion-weighted and contrast enhanced cranial magnetic resonance imaging revealed no additional pathology in the head. Paranasal sinus tomography was also requested in addition and soft tissue densities in maxillary and ethmoid sinuses were detected at tomography. Patient referred to otorhinolaryngology surgeon with prediagnosis of orbital cellulite and acute sinusitis.

Figure 1: Brain computed tomography, detected in the loss of the right maxillary and ethmoid sinus ventilation



Purulent drainage and hyperemic mucosa were seen in the endoscopic examination. Ampicillin IV treatment was started during the emergency observation, and the ophthalmology and neurology physicians invited for consultation. No additional pathologies were detected. The patient was admitted to the otorhinolaryngology clinic for operation because of complicated sinusitis. Ampicillin sulbactam 4x1.5 and metronidazole 2x1 treatments were administered for post infectious diseases. After surgical drainage, the patient was discharged with appropriate antibiotics.

Conclusion

In the presence of acute sinusitis, infection may enter the orbital periosteum and spread to neighboring tissues. If the orbital cellulite develops, the eyelid swelling may occur, but it is not red or painful, eye becomes proptosis. The conjunctiva can be hyperemic and the eye movements are limited. The loss of vision is a sign of spread infection. Vision loss can be partial or complete and unfortunately sometimes permanent (3). Depending on the severity of the infection and orbital complications proptosis, bulbus motion restriction, chemosis, diplopia, pupillary reflex reduction, decreased visual acuity and even permanent visual loss can be seen. (4)

Radiological imaging methods are important both in verifying the diagnosis and in planning surgical treatment for paranasal sinuses or sinusitis complications (5). Computerized tomography is a highly effective imaging modality for the evaluation of both paranasal infections and their complications. In magnetic resonance imaging, cavernous sinus is important in assessing complications related to sinus infections such as thrombosis.

Every patient considered to have orbital complications should be asked for an ophthalmology consultation to assess the eye movements and their visual acuity. A problem in visual functioning is an urgent indication for surgery. Visual loss develops due to the increase of intraorbital pressure caused by cellulite, septic optic neuritis, embolic and thrombotic lesions in the vascular system that feed choroids, purulent inflammation of the optic nerve, or corneal ulceration. (6-9)

Patients with orbital complications should be hospitalized and immediate intravenous antibiotic therapy should be started. In medical treatment, ampicillin-sulbactam combination, cefuroxime, ceftriaxone is preferred intravenously (6, 10, and 11). We started ampicillin-sulbactam treatment intravenously in our patient. If orbital abscess is detected despite antibiotic treatment, urgent surgical drainage is advised in case of complaints such as limitation of eye movements, decrease in visual acuity, following eye consultation. (12).

Rhinosinusitis is one of the frequent reasons for referral to emergency services. Patients should informed for the complications that may develop and in recurrent admissions emergency physicians should be alert for related

complications. In particular, keeping in mind the orbital complications can prevent permanent visual loss and allows the patient to receive appropriate treatment.

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