THE COMBINED EFFECTS OF MANUAL CHEST SQUEEZING COORDINATED EXPIRATION WITH RELAXATION POSTURES IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

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METHODS and MATERIALS

29 stable outpatients with COPD (25males and 4females, mean age 74.0±8.7years) participated in the study, whose characteristic data were measured (*Table 1*).
We measured mouth occlusion pressure ($P_{0.1}$), ventilatory parameters, and degree of relaxation used by visual analogue scale (VAS) in quiet breathing at sitting, forward-leaning sitting and semi- Fowler's position in randomized order *(Fig.1).*
For $P_{0.1}$ measurement, we used measurement devices Inflatable balloon-type Series 9300 (Hans Rudolp Inc) and Differential pressure transducer TP-602G (Nippon-Koden Inc).
We also measured these parameters with manual chest squeezing on lower chest in the most comfortable position in these 3 positions (*Fig.2).*

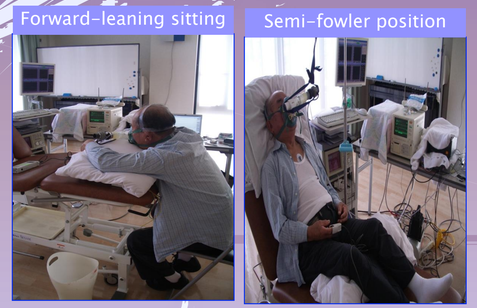

Fig.1. The measuring in each posture

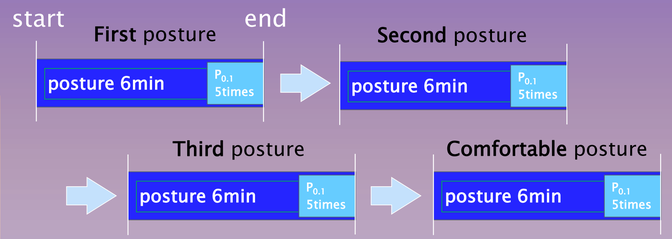

Fig.2. The protocol of this study

We analyzed these data based on GOLD classification.
Data analysis was performed by using software SPSS Statistics 17.0. P values <0.05 were considered statistically significant.

These studies was approved by Kyorin University, Faculty of Health Sciences Ethics Committee and Showa University Fujigaoka Hospital Ethics Committee.
All subjects gave written, informed consent.

Table1.
The characteristics of subject

age (year)	74.0±8.7
height (cm)	163.3±8.6
BW (Kg)	58.7±11.2
FVC (L)	2.69±1.15
FEV_1 (L)	1.38±0.82
FEV_1% (%)	50.6±14.4
$\%FEV_1$ (%)	52.6±24.0
FRC (L)	3.76±1.15
RV (L)	2.94±0.89
TLC (L)	6.00±1.18
VC (L)	3.13±0.99
PI max (cmH_2O)	56.1±23.3
PE max (cmH_2O)	72.8±31.5

means±SD

INTRODUCTION

Relaxation postures are recommended to reduce the work of breathing and dyspnea in patients with COPD. We reported that effects of relaxation postures for COPD in ERS international Congress 2011. However, it is still unclear that the effects of the manual chest squeezing coordinated expiration with relaxation postures in patients with COPD. The purpose of this study is to clarify combined effect of the manual chest squeezing on the relaxation postures from the point of view of clinical stratification.

RESULTS

In the total number of 29 patients, for comfortable position, the best was for Semi-fowler, and Forward-leaning sitting and Sitting followed in that order ($p<0.0001$).
There were significantly reduced in VO_2, VCO_2, $ETCO_2$, VAS after chest squeezing ($p<0.001$) (*Figure.3).*
$P_{0.1}$ and $P_{0.1}$/PImax did not show reduction with chest squeezing (*Table2).*
In the GOLD classification, the most comfortable position was Forward-leaning sitting in patients for GOLD-IV, Semi-Fowler's position in patients for GOLDIII ($p<0.05$) *(Table3).*

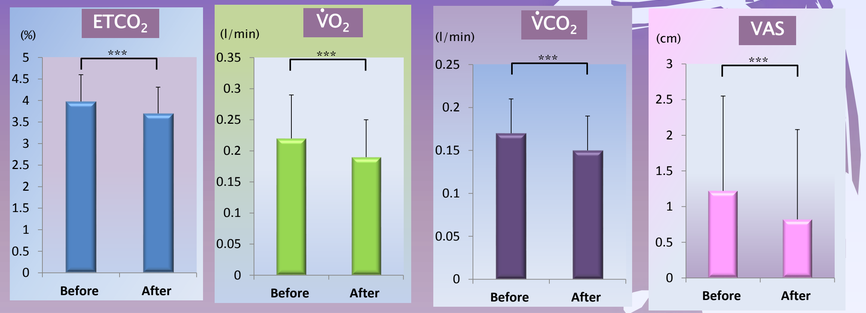

Fig.3. Changes of Ventilatory parameters and degree of relaxation
"Before" and "After" Chest squeezing
*** $p<0.001$

Table2. $P_{0.1}$ and $P_{0.1}$/PImax
"Before" and "After" Chest squeezing

Chest squeezing	$P_{0.1}$ (cmH_2O)	$P_{0.1}$/PImax (cmH_2O)
Before	2.70±1.01	5.61±3.10
After	2.69±1.09	5.84±4.31

Table 3.
The relationship between relaxation and severity

		Sitting	Forward-leaning sitting	Semi-fowler's position
GOLD Ⅰ	N	1	1	1
	residual error	1.0	0.6	-1.2
GOLD Ⅱ	N	3	1	7
	residual error	1.6	-1.2	-0.2
GOLD Ⅲ	N	0	0	8
	residual error	-1.3	-1.7	2.4
GOLD Ⅳ	N	0	4	3
	residual error	-1.2	2.7	-1.4

$\chi^2 = 13.927$
$p < 0.05$

CONCLUSIONS

In our comparison data of combined effect of the manual chest squeezing on the relaxation postures, GOLD classification shows differences about the most comfortable position .

The ventilatory parameters and degree of relaxation reduced after chest squeezing. However, $P_{0.1}$ and $P_{0.1}$/PImax as an index of the respiratory central output did not show difference.

We infer that manual chest squeezing with relaxation postures can be effective for the reduction of ventilatory parameters and dyspnea except for central output in patients with COPD.

DISCLOSURE
The authors have no conflicts of interest.