

## DYNAMICS OF RESPIRATORY MUSCLES CHANGES DURING CHRONIC OBSTRUCTIVE PULMONARY DISEASE PROGRESSION

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The aim was to assess respiratory muscles (RM) status in men with different stages of COPD. 152 COPD pts (51-67 yrs old) with acute exacerbation and control group (34 healthy men matched according to the age and body mass index - BMI) were examined. These pts were divided into 3 groups according to severity: COPD<sub>1</sub> - 42 pts (age - 55 yrs; FEV<sub>1</sub> - 85%; BMI - 27 kg/m<sup>2</sup>; smokers - 79%); COPD<sub>2</sub> - 80 pts (age - 57 yrs; FEV<sub>1</sub> - 55%; BMI - 30 kg/m<sup>2</sup>; smokers - 78%) and COPD<sub>3</sub> - 30 pts (age - 60 yrs; FEV<sub>1</sub> - 33%; BMI - 25 kg/m<sup>2</sup>; smokers - 86%). The following RM were studied: muscles of inspiration - sternocleidomastoid (SCM), scalenus anterior (SA), external intercostals (ExI) and muscles of expiration - abdominal internal oblique (AIO), abdominal external oblique (AEO), rectus abdominis (RA), transversus abdominis and internal intercostals. We received the following indices of RM: homogeneity (IH), echogenicity (IE) and structure density (ISD) using the ultrasonic scanner to measure peak of histograms in the B-mode image. So, ISD of SCM was increased significantly (by 9% vs. the control) in COPD<sub>1</sub> while it was decreased in COPD<sub>2</sub> (by 14% vs. the control). IE was decreased in COPD<sub>1</sub> (by 18%) and increased (by 18% vs. the control) in COPD<sub>2</sub>. Vice versa IH of SCM was increased in COPD<sub>1</sub> (by 6% vs. the control) and decreased in COPD<sub>2</sub> (by 13% vs. the control). We observed the increase of IH of SCM in COPD<sub>3</sub> (by 8% vs. COPD<sub>2</sub>; p<0,05), but this parameter still remained below the control (by 7%). The similar picture was detected in ISD in COPD<sub>3</sub>: increasing vs. COPD<sub>2</sub> (by 21%; p<0,05) and almost reaching the control value. Dynamics of these indices of SA was similar to SCM, but was less pronounced during COPD progression. IH of ExI was decreased significantly in COPD<sub>2,3</sub> (by 13% and 15% vs. the control), while IE of ExI was increased in COPD<sub>2,3</sub> (by 29% and 21% vs. the control). ISD of ExI did not significantly differ from the control value. The changes of echodensitometric parameters of expiration RM were similar to RM of inspiration. So, IH and ISD of AIO were decreased significantly in COPD<sub>2</sub> (by 7% and 7% vs. the control) and in COPD<sub>3</sub> (by 7% and 5%), while IE was increased in COPD<sub>2,3</sub> (by 14% and 10% vs. the control). IH and IE of AEO did not differ from the control in COPD<sub>1,2,3</sub>, although ISD was decreased only in COPD<sub>2</sub> (by 10% vs. the control). IH and ISD of RA were also decreased in COPD<sub>2</sub> (by 18% and 20%) and COPD<sub>3</sub> (by 20% and 13% vs. the control) while IE was increased significantly in COPD<sub>2,3</sub> (by 31% and 42%). **Conclusions:** (1) these echodensitometric parameters showed heterogeneity of RM changes and in a complex way reflected the dynamics of pathological processes occurring in RM during COPD progression; (2) more dystrophic changes were detected in SCM, ExI and AIO, AEO, RA and bigger difference was detected according to IE between these COPD groups.