N. Trembach 1; I. Zabolotskikh 2

1Kuban State Medical University, Department of anesthesiology, reanimatology and transfusiology, Krasnodar, Russia, 2Kuban State Medical University, Krasnodar, Russia

Introduction:
Assessing the sensitivity of the peripheral chemoreflex (SPCR), we can predict the likelihood of developing respiratory and cardiovascular disorders. SPCR is one of the markers of disease progression and good prognostic marker [1]. Disturbed respiratory mechanics can make it difficult to evaluate. Breath-holding test may be helpful in such situation, the results of this test are inversely correlated with peripheral receptor sensitivity to carbon dioxide in healthy people [2]. The aim of the study was to compare the breath-holding test to single-breath carbon dioxide test in the evaluation of the sensitivity of the peripheral chemoreflex in subjects with COPD.

Methods:
The study involved 78 patients with COPD with FEV1/FVC <70% of predicted, all participants were divided into two groups depending of disease severity (GOLD classification, 2017). In group 1 (mild-to-moderate COPD, n=46) all patients had FEV1≥50% and in group 2 (severe-to-very severe COPD, n=32) all patients had FEV1<50%.

Breath-holding test was performed in the morning before breakfast: voluntary breath-holding duration was assessed three times, with 10 min intervals [2]. A mean value of the duration of the three samples was calculated. The single-breath carbon dioxide test [3] was performed the next day. The study was approved by the local ethics committee. All subjects provided signed informed consent to both tests. The reported study was funded by RFBR, research project No. 16-34-60147 mol_a_dk.

Results:
The average SPCR measured with single-breath carbon dioxide test was 0.42±0.12 L/min/mmHg in group 1 and 0.26±0.08 L/min/mmHg in group 2. The average breath-holding duration was 44±13 seconds in group 1 and 37±13 seconds in group 2. During the correlation analysis a significant negative correlation between the results of two tests was noted (-0.79, p <0.05) in group 1 and a weak negative correlation in group 2 (-0.32, p <0.05).

Conclusion:
Peripheral chemoreflex sensitivity to carbon dioxide can be indirectly evaluated by a breath-holding test in patients with mild-to-moderate COPD, its assessment in severe COPD need further investigations.

References: