

The thesis evaluates respiratory and postural function of the diaphragm, studying how the two diaphragmatic functions are interrelated. The author of the thesis is interested in the postural function of the diaphragm because of its stabilization role on the spine. The diaphragm helps to regulate (increase) intraabdominal and intrathoracic pressure, thus bracing the spine while the external forces act on the spine. Disturbed postural activity of the diaphragm is considered to be one of the most frequent etiopathogenetic factors in vertebrogenic syndromes.

In this research function of the diaphragm was analyzed during respiration and during postural function of the diaphragm, i.e. independently on respiration, by means of dynamic magnetic resonance (MR). Diaphragmatic dynamic magnetic resonance studies were synchronized with spirographic records. In the probands spirometric studies were also carried out, including force analysis of the respiratory muscles, as well as EMG diaphragmatic activity.

30 healthy individuals of mean age 29,3 years (ranging from 22,2 to 56,2 years) were involved in the study. Diaphragmatic activity was studied during primary breathing and in the course of upper and lower extremities' flexion against resistance, under two circumstances, while breathing and while holding the breath. All these functions were studied by means of dynamic MR sequences.

The results show that during simultaneous breathing and postural activity flattening (i.e. contraction) of the diaphragm is much greater than during primary breathing only. The diaphragm is activated during postural activity itself, i.e. independently on breathing. During trunk bracing, the diaphragm is not activated in homogenous way (as one functional unit) but its individual parts can be activated differently.