ARTIFICIAL NEURAL NETWORKS IN THE ANALYSIS OF COUGH SOUND

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Cough is the most common symptom of many respiratory diseases. Objective monitoring frequency of cough can be useful in clinical practice, clinical research and in the assessment of the novel therapies. The aim of our study is to develop the algorithm for objective monitoring of cough frequency. Number of coughs will be counted on the basis of mathematical analysis of cough sound in the time and frequency domains. We obtained the 5-hours sound recordings from six patients suffering from cough due to their respiratory disease. Because the cough sound has typical rapid growth of the intensity at the beginning, we used for their detection the time progress of the first derivation in time. The first derivation was computed from the time progress of the standard deviation (SD), which was calculated from the raw recordings. The identified sound events were characterized using by the Mel Frequency Cepstral coefficients (MFCC). The obtained cough sounds were classified to the cough and non-cough sound groups using by the artificial neural network (ANN). The ANN was trained for each patient separately. The training group consisted approximately from 20% cough and non-cough sounds. The accuracy of our algorithm was interpreted using by the values of sensitivity and specificity. The mean value of sensitivity reached from the all evaluated patients was 83.79% and the mean value of specificity was 95.87%. In the future we would like to improve our algorithm for better accuracy of cough frequency analysis.