

The use of handheld ultrasound device in cardiac examination of patients with history of COVID-19

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Background: Clinical usefulness of Handheld Ultrasound Device [HUD] was previously confirmed in numerous clinical scenarios. During the previous two years Covid-19 patients become a focal point of healthcare worldwide. The assessment of long term consequences of this infection is bound to overload already burdened healthcare system.

Purpose: To assess clinical usefulness of HUD as an adjunct to physical cardiac examination of patients with history of COVID-19.

Methods: Study population consisted of randomly selected patients with no symptoms of cardiovascular pathology, who had been hospitalized due to COVID-19 one year prior to examination. Physical examination and clinical assessment was augmented with short examination with the use of HUD, which included: visual evaluation of the global and regional LV function, measurement of RV size, screening for the significant valve defects and the presence of pericardial effusion. Subsequently full echocardiographic examination with the use of high-end workstation was performed, which results were treated as reference.

Results: 54 patients (35 men, mean age 63±13 years) were enrolled into the study. In clinical examination no significant cardiovascular abnormalities were discovered. In 30 [56%] of patients cardiac abnormalities in HUD examination were detected. In 18 patients [33%] LV function assessment was not performed, due to insufficient quality of registered

view. In the remaining group significant impairment of LV ejection fraction (<50%) was detected in HUD examination in 3 [6%] patients (2 confirmed in full examination, positive predictive value [PPV] 57%, negative predictive value [NPV] 97%, AUC 0,82±0,17, P 0,057). WMA were diagnosed in 6 [11%] patients (4 confirmed in full examination, PPV 84% NPV 78%, AUC 0,69±0,17, P 0,02). RV enlargement was identified in 21 [39%] patients (PPV 57%, NPV 97%, AUC 0,85±0,05, P<0,0001), mild pericardial effusion in 3 [6%] patient (1 confirmed in full echocardiographic examination; 2 false positive, no false negative), at least moderate mitral/tricuspid/aortic valve insufficiency in 7 [13%] patients (3 confirmed, 4 false positive cases, no false negative). A total mean time of the heart and lungs HUD examination was 2,1±0,6 minute.

Conclusion: Cardiac abnormalities exposed in brief assessment with the use HUD are a relatively common finding in asymptomatic patients previously hospitalized due to COVID infection in a 1-year follow-up, despite normal physical examination. Normal HUD examination excludes the presence of significant cardiac abnormalities with high probability. However one should keep in mind a relatively high percentage of false positive results, which may lead to an exceeding number of patients referred for a full echocardiographic examination.