**Objective.** To study arterial pressure and left ventricular geometry in heavyweight athletes.

Materials and methods. We examined 645 heavyweight athletes (weightlifters, powerlifters, bodybuilders) with candidate to master of sports, master of sports and international master of sports qualifications with average body weight of 102.7  ±  6.4 kg. All patients underwent general examination, standard electrocardiography, double BP measurement and transthoracic echocardiography.

**Results.** The results of investigation showed that 248 (37 %) athletes had increased BP (systolic BP — ​157,4  ±  5,6, diastolic BP – 91,2  ±  5,3) and left ventricular (LV) geometry impairment. The following heart parameters increased in athletes with hypertension compared with normotensive athletes: diastolic interventricular thickness by 0,1 mm (p  <  0,01), left ventricular posterior wall thickness by 0,2 mm (p  <  0,01), right ventricular diameter by 4.2 mm (p  <  0.01), LV myocardial mass by 32, 2g (p  <  0,01), LV myocardial mass index by 17,8 g/m2, LV relative wall thickness by 0,08 mm (p  <  0,01). LV end-diastolic volume was 0,2 mm (p  <  0,05) lower in hypertensive athletes.

**Conclusion.** Thus, the results of the study on the association between BP and heart geometry disturbances in heavyweight athletes may be used as the scientific basis for organizing preventive programs with the main focus on risk groups.

**Key words:** arterial pressure, arterial hypertension, sport, athlete heart, sudden cardiac death, myocardial hypertrophy, heart remodeling.