NONINVASIVE HEMODYNAMIC STUDY OF THE PULMONARY CIRCULATION

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NONINVASIVE HEMODYNAMIC STUDY OF THE PULMONARY CIRCULATION (Abstract): Cardiac catheterization is the reference method for the hemodynamic study of the pulmonary circulation. However, cardiac catheterization is an expensive and invasive method. Echocardiography is a reliable noninvasive alternative method. The purpose of our study was to determine the correlation between echocardiographic and hemodynamic data obtained by cardiac catheterization in patients with pulmonary hypertension. Material and methods: We conducted a prospective study on 55 subjects diagnosed with pulmonary hypertension. They were examined by echocardiography and cardiac catheterization. The following parameters were measured: systolic, mean and diastolic pulmonary artery pressure and pulmonary vascular resistance. We determined the coefficient of linear correlation (Pearson) between the two methods. Results: The mean pulmonary artery pressure obtained by cardiac catheterization was 48.82 ± 18.4 mm Hg; the systolic pulmonary artery pressure at cardiac catheterization was 67.86 ± 22.31 mm Hg; the diastolic pulmonary artery pressure was 32.85 ± 15.49 mm Hg; the pulmonary resistance was 10.4 ± 5.14 Wood units. We obtained very good correlation between the two methods for systolic pulmonary artery pressure (r 0.847, p <0.0001), mean pulmonary artery pressure (r 0.7, p <0.001), diastolic pulmonary artery pressure (r 0.54, p 0.01) and pulmonary vascular resistance (r 0.82, p <0.001). Conclusions: Echocardiography is an excellent method for the hemodynamic study of the pulmonary circulation. Key words: PULMONARY HYPERTENSION, ECHOCARDIOGRAPHY, CARDIAC CATHETERIZATION, HEMODYNAMICS

Pulmonary circulation is a vascular system subject to certain pressure and volume conditions different from the systemic circulation. It is a system of low pressures and resistances, which functions under increased flow conditions and which creates a resistance by ten times lower than the systemic resistance. The pulmonary resistance is quantified according to Ohm’s law, by the ratio between the difference of pressure of the pulmonary artery (PAP) and the pulmonary capillary pressure (PCP) and the cardiac output (CO). Its value can be expressed in mmHg/l/min (or Wood units) or converted by multiplication with 80 in order to express the result in dyne.sec.cm⁻⁵.

\[ R_{VP} = \frac{(PAP - PCP)}{CO} \] (1)

Even under effort conditions, where the