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CASE REPORT

IDIOPATHIC PULMONARY HYPERTENSION – CASE PRESENTATION

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SUMMARY

Pulmonary hypertension (PH) is a hemodynamic condition characterized by a mean pulmonary artery pressure (mPAP) ≥ 25 mmHg at rest, pulmonary arterial wedge pressure (PAWP) ≤ 15 mmHg, and pulmonary vascular resistance (PVR) > 240 dyn·s·cm^{-5}. The annual incidence of pulmonary arterial hypertension (PAH) is approximately 3–10 new cases per million adults. It is estimated that the prevalence of pulmonary hypertension in individuals over 65 years of age is around 10%.The aim of this study is to present the case of a female patient with progressive dyspnea in whom PAH remained undiagnosed for a prolonged period.A 74-year-old female patient, M.P., was hospitalized in the Coronary Care Unit of the Clinical Center in Kosovska Mitrovica due to symptoms of shortness of breath, choking, fatigue, leg swelling, and weakness. The admission ECG revealed: sinus rhythm, normal axis, high R wave in V2, ST depression, and negative T waves in leads II, III, aVF, and V4–V5. Echocardiography findings showed right ventricular enlargement (2.9 cm), pulmonary artery dilation (3.3 cm), 1–2+ pulmonary regurgitation, and 3+ tricuspid regurgitation, with a systolic pulmonary artery pressure (SPAP) of up to 126 mmHg. The right ventricle measured 5.3 cm in the 4Ch view, with a TAPSE of 1.8 cm. Right heart catheterization revealed the following pressures: PA 78/34/57 mmHg, RV 74/8/10 mmHg, RA 6/6/7 mmHg, CO 4.3 l/min, and LV 99/10/8 mmHg.
Although primary pulmonary hypertension is predominantly a disease of younger individuals, it should also be considered in older patients presenting with progressive dyspnea in the absence of structural heart disease.

Keywords: pulmonary hypertension, echocardiography, SPAP

SRPSKI

IDIOPATSKA PLUĆNA HIPERTENZIJA - PRIKAZ SLUČAJA

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SAŽETAK

Plućna hipertenzija (PH) predstavlja hemodinamsko stanje koje karakterišu: srednji pritisak u plućnoj arteriji (PAPm) ≥ 25 mmHg u mirovanju, plućni arterijski klinasti pritisak (PAWP) ≤ 15 mmHg i plućni vaskularni otpor (PVR) > 240 dyn·s·cm^{-5}. Godišnja incidencija plućne arterijske hipertenzije (PAH) iznosi približno 3–10 novih slučajeva na milion odraslih osoba. Smatra se da prevalencija plućne hipertenzije kod osoba starijih od 65 godina iznosi oko 10%.Cilj ovog rada je da prikaže slučaj pacijentkinje s progresivnom dispneom, kod koje je PAH ostala dugo neprepoznata. Pacijentkinja M.P., 74 godine, hospitalizovana je u Koronarnu jedinicu Zdravstvenog centra Kosovska Mitrovica zbog osećaja otežanog disanja, gušenja, zamaranja, otoka nogu i malaksalosti. EKG na prijemu pokazao je: sinusni ritam, normogram, visok R talas u V2, ST depresiju i negativan T talas u odvodima D2, D3, aVF i V4–V5. Na ehokardiografiji je desna komora uvećana (2,9 cm), plućna arterija dilatirana (3,3 cm), prisutna 1–2+ pulmonalna regurgitacija i 3+ trikuspidna regurgitacija, sa sistolnim pritiskom u desnoj komori (SPDK) do 126 mmHg. Dimenzije desne komore u 4Ch projekciji iznose 5,3 cm, dok TAPSE iznosi 1,8 cm. Tokom kateterizacije desnog srca, izmereni su sledeći pritisci: PA 78/34/57 mmHg, RV 74/8/10 mmHg, RA 6/6/7 mmHg, CO 4,3 l/min, LV 99/10/8 mmHg.
Iako je primarna plućna hipertenzija predominantno bolest mlađih ljudi, na nju treba misliti i kod starijih osoba, posebno u prisustvu progresivne dispnee bez strukturne bolesti srca.

Ključne reči: plućna hipertenzija, ehokardiografija, SPDK

INTRODUCTION

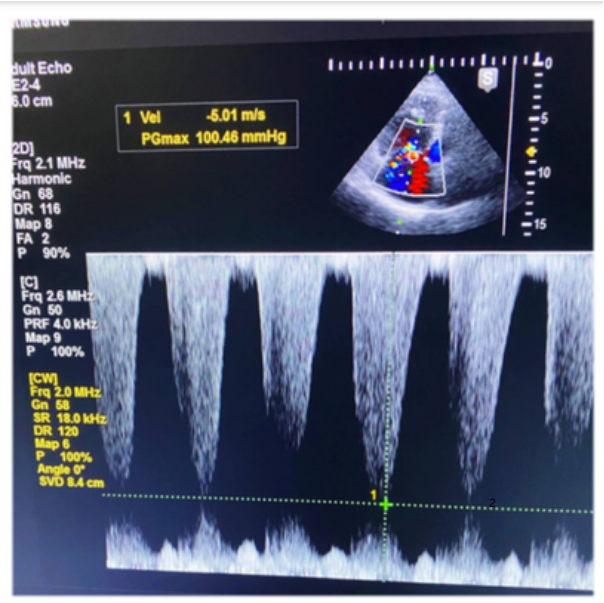
Pulmonary hypertension represents a hemodynamic condition characterized by a mean pulmonary artery pressure (PAPm) ≥ 25 mm Hg at rest, a pulmonary arterial wedge pressure (PAWP) ≤ 15 mm Hg, and a pulmonary vascular resistance (PVR) >240 dyn·s·cm^{-5}. Pulmonary arterial hypertension (PAH) refers to a subgroup of pulmonary hypertension with pre-capillary pulmonary hypertension characterized by elevated pulmonary vascular resistance (PVR), i.e., PAPm ≥ 25 mm Hg with normal PAWP ≤ 15 mm Hg and PVR > 240 dyn·s·cm^{-5} (1,2). The annual incidence of pulmonary arterial hypertension is around 3-10 new cases per million adults. Pulmonary hypertension affects about 1% of the global population and is not considered a rare disease. The prevalence of pulmonary hypertension in individuals older than 65 years is estimated to be around 10% (3). In Germany, the incidence of pulmonary arterial hypertension in 2014 was 3.9 per 1 million adults, with a prevalence of 25.9 per million adults (4). Initially, it was believed that pulmonary arterial hypertension mainly affected young women; however, in recent years, the median age of patients diagnosed with pulmonary arterial hypertension in Germany has steadily increased, currently standing at 65 years (4, 5). The expected lifespan of patients with pulmonary arterial hypertension has increased over the last three decades. The three-year survival rate for this group is now 70-80% (5), compared to 40% in the 1980s.The cardinal symptom of any form of pulmonary hypertension is progressive dyspnea upon exertion, often accompanied by fatigue and exhaustion. In patients with pulmonary hypertension, frequent syncope even with minimal exertion clearly indicates the presence of a life-threatening condition associated with high mortality. Physical examination of patients with compensated pulmonary hypertension often does not reveal abnormalities. The most common signs are central and peripheral cyanosis, though these are very subtle, and occasionally an auscultatory murmur from tricuspid regurgitation. To diagnose pulmonary hypertension, an ECG and measurement of natriuretic peptide levels are necessary. If both do not show abnormalities, it is unlikely that pulmonary hypertension is present (8). Echocardiographic assessment of right ventricular pressure is often unreliable, but when combined with signs of right heart overload, echocardiography usually provides clear signs of pulmonary hypertension, indicating the type of investigation that should follow (1,2). Pulmonary hypertension can only be definitively confirmed by right heart catheterization, which is absolutely indicated only for patients suspected of having pulmonary arterial hypertension or chronic thromboembolic pulmonary hypertension, while other forms may not require it. According to guidelines, oxygen therapy is indicated whenever there is manifest hypoxemia with arterial pO2 < 60 mm Hg. Any anemia or iron deficiency without anemia should be corrected. Venipuncture is rarely indicated in patients with polycythemia. When it comes to diuretics in PAH therapy, we use loop diuretics in combination with mineralocorticoids. Anticoagulation is no longer recommended for general use (1,2,9).

Patients with idiopathic or hereditary pulmonary arterial hypertension, or PAH associated with medications, are initially treated with calcium channel antagonists. However, this form of treatment is an option for less than 5% of PAH patients (1,2). For the treatment of idiopathic pulmonary hypertension, specific medications are used, classified into five groups. These drugs are used either alone or in combination. Despite all the assumed treatment modalities, pulmonary arterial hypertension remains an incurable disease with high mortality and poor prognosis. The goal of treatment is to control the disease, i.e., to stabilize the patient at a satisfactory clinical level (Functional Class I or II of the WHO), without signs of right heart failure and ideally without disease progression. In one randomized study using initial combination therapy (10), this goal was achieved in 40% of patients. The choice of medication partially depends on the severity of the pulmonary arterial hypertension. According to mortality risk, PAH patients are categorized into low, medium, and high-risk groups. Patients with newly diagnosed "typical" pulmonary arterial hypertension and low or medium risk receive initial or early combination therapy, which includes an endothelin receptor antagonist (ERA) combined with a phosphodiesterase-5 (PDE5) inhibitor or soluble guanylate cyclase (sGC) stimulator (10–12). For high-risk patients, the recommended initial treatment is a triple combination of ERA, PDE5 inhibitors or sGC stimulators, and an intravenous prostacyclin analog. The patient's response to therapy is assessed after 4-12 weeks initially. If the patient has not achieved the primary treatment goal, i.e., reaching the low-risk category, after initial treatment, the next step is double or triple combination therapy.

The aim of this work is to present a case of a patient with progressive dyspnea who had long remained undiagnosed with PAH.

Patient: M.P., 74 years old, was admitted to the Coronary Unit of ZC KM due to difficulty breathing, suffocation, fatigue, leg swelling, and malaise. These symptoms had persisted for the past 2 years but intensified over the past few days. She has been treated for high blood pressure and varicose veins for several years and denies any allergies to food or medication.
Upon admission, she was alert, oriented, eupnoic, acyanotic, and had normal skin and mucous membrane color. She had a medium skeletal muscular build and normal nutrition. Her chest was cylindrical, and both sides showed normal respiratory movement. On auscultation, a slightly harsh inspiratory wheeze was heard at both basal lung regions. Cardiac rhythm was regular, with an accentuated P2 and a systolic murmur at the apex. Upon admission, her blood pressure was 140/100 mmHg, and her heart rate was 80 bpm. Her abdomen was soft to palpation, non-tender, with no palpable liver or spleen enlargement. Discreet pretibial edema was noted, with pronounced varicosities on the left inner knee. Peripheral arterial pulses were symmetrical and palpable.
The patient was clinically, echocardiographically, and radiologically evaluated upon admission. Her ECG showed sinus rhythm, normogram, high R in V2, ST depression, and negative T in D2, D3, aVF, V4-5.
Blood tests, echocardiography, and further diagnostics were carried out.
Echocardiogram: The aorta has normal width at the root and ascending segment, measuring 31 mm. The aortic valve is tricuspid, with preserved leaflet separation. The left atrium is of normal size, measuring 3.4 cm, and there is 1+ mitral regurgitation. The mitral apparatus is not significantly morphed. An aneurysm of the interatrial septum is observed, oriented towards the left atrium. Color Doppler does not show clear signs of a shunt at this level. The left ventricle has normal dimensions, 41/25 mm, with slowed relaxation, no segmental kinetic abnormalities, and preserved overall systolic function. A D-shaped left ventricle is noted. The right ventricle is enlarged, measuring 2.9 cm. The pulmonary artery is dilated to 3.3 cm. 1-2+ pulmonary regurgitation is registered. There is 3+ tricuspid regurgitation, with an SPAP of 126 mmHg. RV 4Ch is 5.3 cm, TAPSE is 1.8 cm. The pericardium shows no changes. The inferior vena cava (IVC) is dilated, compressible during inspiration up to 1/3. (Figure 1)

Figure 1.



In the laboratory tests, Troponin T is 12, CK is 35, BNP is 502, NT-proBNP is 4518, D-dimer is 0.86, and the remaining laboratory values are within the reference range.
Gas analysis: pH 7.52, pO2 20, pCO2 68, glucose 5.2, lactate 0.7, HCO3 16.3, standard HCO3 21.5, BE -4.2, BEecf -6.6.

Given the significantly elevated pressure in the right ventricle and the suspicion of pulmonary thromboembolism, the patient urgently underwent MSCT PA according to the pulmonary embolism protocol. The pulmonary artery trunk is dilated, with the left lung (LL) reaching 44mm, large left pulmonary artery (LPA) 25mm, and right pulmonary artery (DPA) 27mm, showing a complete defect in the segmental branch for S4-S5 on the CT scan, with discretely hypoperfused parenchyma in the peripheral S4 region. No signs of PTE were observed in other areas. No changes in the parenchyma.

Since the diagnostic procedures performed could not explain the cause of the elevated pressure in the right heart, the patient was referred to the UKCS Belgrade for further diagnostics. During hospitalization, right heart catheterization was performed: In the ostial segment of the main stem, stenosis up to 30% was observed. The LAD (left anterior descending artery) showed no angiographically significant stenoses in the proximal, medial, and distal segments. The distal segment of the LAD was tortuously altered. The circumflex coronary artery showed no stenoses in its proximal and distal segments. The RCA (right coronary artery) showed no stenoses in its proximal, medial, and distal segments. Pressures were measured in the right heart: PA (pulmonary artery) 78/34/57 mmHg, RV (right ventricle) 74/8/10 mmHg, RA (right atrium) 6/6/7 mmHg, CO (cardiac output) 4.3 L/min, LV (left ventricle) 99/10/8 mmHg. (Figure 2.)

Figure 2.

Supplementary diagnostics were performed:

Ergospirometry on an ergocycle: EKG showed no ST-T changes during exertion and recovery. The test indicates preserved functional heart capacity, severely reduced ventilatory function, and signs of pronounced pulmonary hypertension.
Spirometry: Normal ventilation, FVC 108% (2.08L), FEV1 130% (2.031), FEV1%/FVC 97.30%.
Vascular surgery and lower leg vein CDS: Iliac, femoral, popliteal, anterior and posterior tibial veins were normal, with no signs of thrombosis. The right great saphenous vein had varicose branches, but no thrombotic masses. The left leg showed varicosities in the trunk and branches of the great saphenous vein, but again, no thrombotic masses.
During hospitalization, the patient was treated with calcium channel blockers, ACE inhibitors, trimetazidine, PPIs, anticoagulant therapy, and symptomatic treatment. After the right heart catheterization and confirmation of pre-capillary pulmonary hypertension, specific PAH therapy with sildenafil and bosentan was introduced. During hospitalization, the patient was asymptomatic, with no significant rhythm disturbances or conduction abnormalities registered."

CONCLUSIONS

The diagnosis of primary pulmonary hypertension is often delayed. Although primary pulmonary hypertension predominantly affects young individuals, it should also be considered in older patients whenever progressive dyspnea is present in the absence of structural heart disease.

REFERENCES

1. Galie N, Humbert M, Vachiery JL, et al. 2015 ESC/ERS Guidelines for the diagnosis and treatment of pulmonary hypertension. Eur Heart J. 2016;37:67–119. [PubMed] [Google Scholar]
2. Galie N, Humbert M, Vachiery JL, et al. 2015 ESC/ERS Guidelines for the diagnosis and treatment of pulmonary hypertension: The Joint Task Force for the Diagnosis and Treatment of Pulmonary Hypertension of the European Society of Cardiology (ESC) and the European Respiratory Society (ERS): Endorsed by: Association for European Paediatric and Congenital Cardiology (AEPC), International Society for Heart and Lung Transplantation (ISHLT) Eur Respir J. 2015;46:903–975. [PubMed] [Google Scholar]
3. Hoeper MM, Humbert M, Souza R, et al. A global view of pulmonary hypertension. Lancet Respir Med. 2016;4:306–322. [PubMed] [Google Scholar]
4. Hoeper MM, Huscher D, Pittrow D. Incidence and prevalence of pulmonary arterial hypertension in Germany. Int J Cardiol. 2016;203:612–613. [PubMed] [Google Scholar]
5. Hoeper MM, Huscher D, Ghofrani HA, et al. Elderly patients diagnosed with idiopathic pulmonary arterial hypertension: results from the COMPERA registry. Int J Cardiol. 2013;168:871–880. [PubMed] [Google Scholar]
6. Rosenkranz S, Gibbs JS, Wachter R, De Marco T, Vonk-Noordegraaf A, Vachiery JL. Left ventricular heart failure and pulmonary hypertension. Eur Heart J. 2016;37:942–954. [PMC free article] [PubMed] [Google Scholar]
7. Cannon JE, Su L, Kiely DG, et al. Dynamic risk stratification of patient long-term outcome after pulmonary endarterectomy: results from the United Kingdom national cohort. Circulation. 2016;133:1761–1771. [PMC free article] [PubMed] [Google Scholar]
8. Bonderman D, Wexberg P, Martischnig AM, et al. A noninvasive algorithm to exclude pre-capillary pulmonary hypertension. Eur Respir J. 2011;37:1096–1103. [PubMed] [Google Scholar]
9. Olsson KM, Delcroix M, Ghofrani HA, et al. Anticoagulation and survival in pulmonary arterial hypertension: results from the comparative, prospective registry of newly initiated therapies for pulmonary hypertension (COMPERA) Circulation. 2014;129:57–65. [PubMed] [Google Scholar]
10. Galie N, Barbera JA, Frost AE, et al. Initial use of ambrisentan plus tadalafil in pulmonary arterial hypertension. N Engl J Med. 2015;373:834–844. [PubMed] [Google Scholar]
11. Pulido T, Adzerikho I, Channick RN, et al. Macitentan and morbidity and mortality in pulmonary arterial hypertension. N Engl J Med. 2013;369:809–818. [PubMed] [Google Scholar]
12. Lajoie AC, Lauziere G, Lega JC, et al. Combination therapy versus monotherapy for pulmonary arterial hypertension: a meta-analysis. Lancet Respir Med. 2016;4:291–305. [PubMed] [Google Scholar]
13. Mandich Crovetto D, Alonso Charterina S, Jimenez Lopez-Guarch C, et al. Multidetector computed tomography shows reverse cardiac remodeling after double lung transplantation for pulmonary hypertension. Radiologia. 2016;58:277–282. [PubMed] [Google Scholar]
14. Tudorache I, Sommer W, Kuhn C, et al. Lung transplantation for severe pulmonary hypertension-awake extracorporeal membrane oxygenation for postoperative left ventricular remodelling. Transplantation. 2015;99:451–458. [PubMed] [Google Scholar]