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Pulmonary Artery Hypertension Associated with HIV Infection in Nine Year-Old Child

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ABSTRACT

Pulmonary arterial hypertension (PAH) is a serious life threatening and severe complication of HIV infection. A PAH presentation in patient with HIV tends to non specific, result in recognized diagnosis at a later stage. A 9 year-old HIV patient came to Pediatric Clinic with a chief complaint of worsening dyspneu for 1 month, leg edema and difficulty lying on a flat bed. Patient showed signs and symptoms that lead to pulmonary hypertension. An ECG findings were sinus rhythm, right axis deviation, and right ventricular hypertrophy. Echocardiography findings showed right ventricular and atrial enlargement, and high probability of pulmonary hypertension. Blood examination showed CD 4 was 84 cells/μL. The patient was managed as pulmonary artery hypertension associated with HIV (HIV-PAH) infection.The patient was admitted for 3 weeks and eventually discharged with relieve condition.

Keywords: pulmonary arterial hypertension; HIV infection.

INTISARI

Hipertensi arteri paru merupakan suatu komplikasi berat dan mengancam nyawa pada suatu infeksi HIV. Tampilan klinis dari pasien hipertensi arteri paru tidak spesifik sehingga menyebabkan diagnosa ditegakkan ketika penyakit sudah fase lanjut. seorang anak penderita HIV yang berumur 9 tahun dibawa ke Klinik Kesehatan Anak (Pediatrik) dengan keluhan utama sesak nafas memberat selama 1 bulan, kaki bengkak, dan sesak pada saat tidur pada alas datar. Pasien menunjukan gejala dan tanda yang mengarah pada suatu hipertensi paru. Temuan EKG menunjukan adanya deviasi aksis ke kanan dan pembesaran ventrikel kanan. Pemeriksaan ekhokardiografi menunjukan tanda pembesaran atrium dan ventrikel kanan serta probabilitas tinggi untuk suatu hipertensi paru. Pemeriksaan darah menunjukan CD 4 sejumlah 84 sel/μL. Pasien ditatalaksana sebagai hipertensi arteri paru yang berhubungan dengan infeksi HIV. Pasien dirawat selama 3 minggu dan akhirnya kondisinya membaik untuk dipulangkan dari rumah sakit.

INTRODUCTION

Pulmonary Arterial Hypertension (PAH) is defined as an increase in mean pulmonary arterial pressure (mPAPm) ≥ 25 mmHg at rest as assessed by right heart catheterization (RHC).[1] A pulmonary hypertension is a serious life threatening and severe complication of HIV infection.[2] A PAH presentation in HIV patient showed nonspecific sign and symptom, resulted in recognized diagnosis at later stage.[2] Pulmonary artery hypertension associated with HIV infection (HIV-PAH) has been documented at all stages of the disease and its manifestations range from asymptomatic right ventricular dysfunction to overt right heart failure.[2] Children with HIV infection may develop this complication.

Some report showed that 41% pediatric HIV patient had echocardiogram lead to PH diagnosis.[3] We presented this case to highlight the cardiovascular complication, especially PAH, of HIV infection.

CASE PRESENTATION

A nine year-old female child came to pediatric clinic with chief complaint a worsening dyspneu for 1 month. Patient also complained of having dyspneu on effort, edema at both leg, difficulty while lying on a flat bed, loss of appetite, and coughs. There were no complaining of fever, diarrhea, and abnormality in urination and defecation. The patient was already diagnosed with HIV infection since she was three years old and regularly took Highly Anti Retroviral Therapy (HAART) since than. Since September 2015 patient had been taking HAART regiment as duviral1/2 tablet t.i.d and alluvia 1 tablet b.i.d. Patient has no history of congenital heart disease diagnosis. Both patient's parents were HIV patients which was diagnosed at the same time with the patient.

On physical examination, the patient looked dyspneu, heart rate 120 beats per minute, respiratory rate 40 times per minute, body temperature was 36 ºC, peripheral oxygen saturation showed 58% on room air. Anthropometric examination revealed weight 19 kg, height 110 cm, WAZ score -4.48 Z (severe underweight), HAZ score -4.47 Z (severe stunted). On head examination patient showed cyanosis on the lips. Neck examination showed no increased on jugular venous pressure. Thorax examination was symmetric, lung sound vesicular and crackles at both lung fields. Cardiovascular examination showed positive right ventricular heaving, no displaced of apical impulse, crisp S1 and S2 sounds with no splitting sound, there were no murmurs or extra cardiac sounds. Abdomen was protuberant with active bowel sounds, it was soft and non tender, palpable hepatomegaly 4 cm below right costal margin, spleen and kidney could not be felt. Extremities were warm, pitting edema was felt at the lower extremity, and fingers looked cyanotic and clubbing.

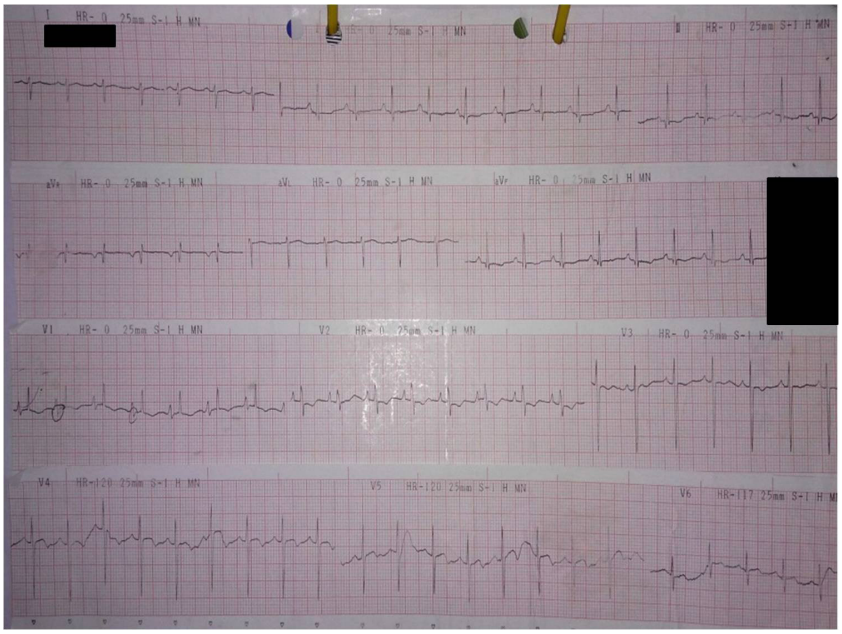

Figure 1. Electrocardiogram showed sinus rhythm, heart rate 100 beats per minute, right axis deviation (RAD) and right ventricular hypertrophy (RVH)

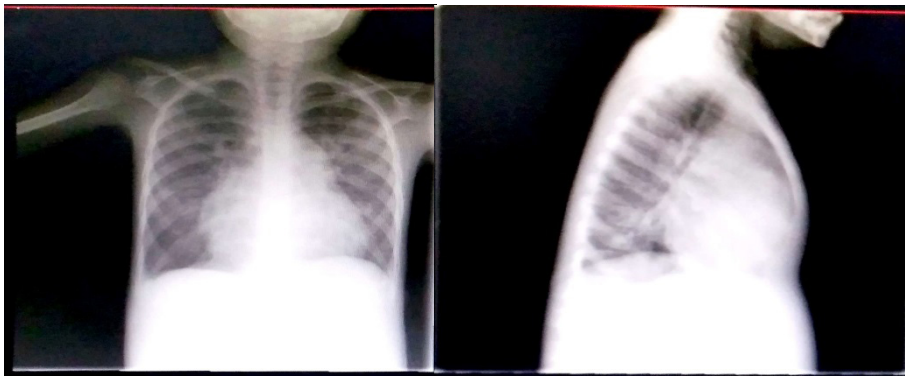

Figure 2. Chest X ray showed bilateral pneumonia, cardiomegaly with configuration right atrium, left atrium, and right ventricle, and increased vascular marking.

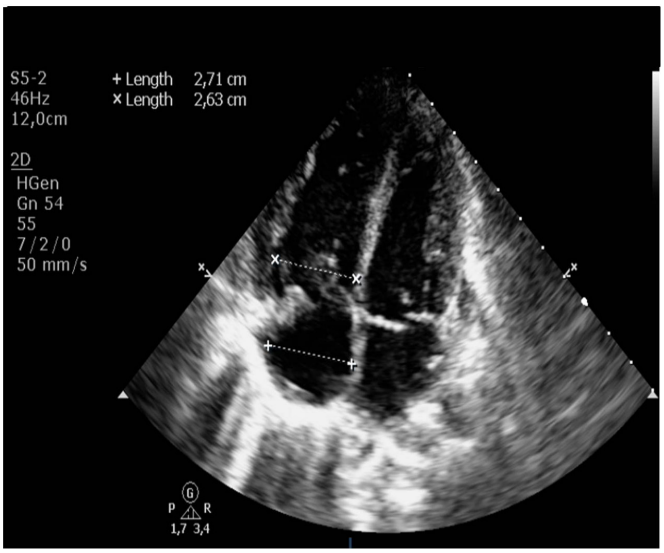

Figure 3. Transthoracic echocardiogram (apical 4 chamber view) showed dilatation on right atrium and ventricle

The electrocardiogram (ECG) showed sinus rhythm, heart rate 100 beat per minute, right axis deviation (RAD) and right ventricular hypertrophy (RVH) (figure 1). Laboratory examination showed hemoglobin level 12.8 g/dL, leukocyte 7,550 cells/μL, thrombocyte 169,000 cells/μL, erythrocyte 4,070,000 cells/μL, hematocrit 42.5 %, albumin 3.41 g/dL, glucose 104 mg/dL, natrium 135 mmol/L, kalium 2,54 mmol/L, chloride 88 mmol/L, and CD4 count 84 cell/μL. Chest X-ray examination showed bilateral pneumonia, cardiomegaly with configuration right atrium, left atrium, and right ventricle, and increased vascular marking (figure 2).

An echocardiogram showed atrial situs solitus, AV-VA concordance, all pulmonary vein drainage to left atrium and systemic vein drainage to right atrium, there was dilatation at right atrium, right ventricle, and pulmonary artery (figure 3). Inter atrial and inter ventricular septum were intact, there was tricuspid regurgitation (Vmax 3.6 m/s, TVG 51 mmHg), trivial pulmonary regurgitation, PVAccT 103 m.s, pulmonary artery diameter 16 mm, inferior vena cava diameter 57 mm with less than 50% collapse, good LV

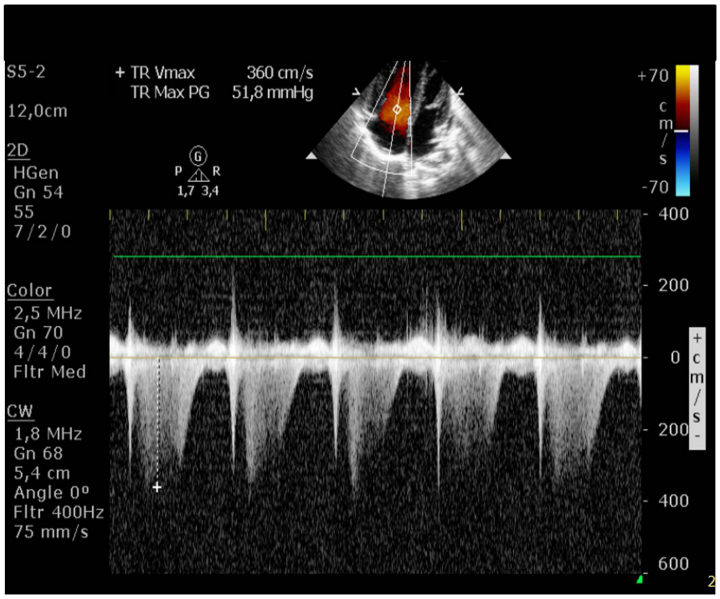

Figure 4. Transthoracic echocardiogram showed tricuspid regurgitation (Vmax 3.6 m/s, TVG 51 mmHg)

contractility (LVEF 66%), decrease right ventricle contractility (TAPSE 8 mm), there were no patent ductus arteriosus, no coarctation of the aorta, no pericardial effusion (figure 4).

Patient was diagnosed as right heart failure, PAH related to HIV (HIV-PAH), and HIV stage 3 on therapy. Patient was given therapy intravenous furosemide 20 mg t.i.d, oral spironolactone 12.5 mgb.i.d, oral lisinopril 2 mg b.i.d, oral sildenafil 7 mg t.i.d, duviral 1/2 tablet b.i.d, aluvia 1 tablet b.i.d, oral cotrimoxazole 480 mg q.i.d, and malnutrition management. Patient was treated at pediatric ward for 3 weeks and discharged in improved clinical condition.

DISCUSSION

Pulmonary artery hypertension associated with HIV infection (HIV-PAH) histopathologic characteristics are not different from idiopathic PH.[1,2,4,5] Pulmonary vasculature is obliterated with medial hypertrophy and increase proliferation of endothelial and smooth muscle cells. Characterized by concentric-obliterative changes on intimal lesion and showed plexiforms lesion that can be detected in 78% patient. However, the mechanism is unclear because there is no substantial proof that HIV directly infected the pulmonary vasculature.[1,2,4,5] The strong candidate is virus's protein, GP 120 and Nef, interaction with pulmonary vasculature is causing the interactions between PAH and HIV. An HIV also plays role by means of chronic inflammation and immune activation produced by HIV infection, which may lead increase secretion proinflammatory cytokines and growth factors that may promote PAH.[1,2,4,5]

Clinical presentation of HIV-PAH is same with idiopathic PH, which sometimes is missed because its unspecified symptoms. Majority patients will present with dyspneu on exertion (85%), pedal edema (20-30%), and non productive cough (19%), fatigue (13%), syncope or near syncope(12%).[6,7] Chest x-ray examination on HIV-PAH patients also show resemblance with PAH without HIV which show cardiomegaly (72%) and pulmonary artery enlargement (71%).[6,7] Electrocardiogram will show pulmonal P, right axis deviation, right ventricular hypertrophy,

right bundle branch block, and sometimes prolonged QT interval.[6,7] Echocardiography is the non invasive test of choice for initial screening for PAH in symptomatic HIV patients.[1,4,8] It is useful for identifying potential causes of PAH, evaluating RV function, and assessing related comorbidities.[1,4,8]

There are no currently available guidelines that available for HIV-PAH therapy.[4,5,7]. Therefore, treatment of HIV-PAH relies on PAH specific therapy and includes supportive treatments and diseased specific treatment.[4,5,7,8] Supportive therapy for HIV-PAH patients includes oxygen administration for hypoxic patient and treatment with diuretics and vasodilators for patient with overt right ventricular failure. Prostanoid as specified treatment of PAH showed a beneficial effect on HIV-PAH patients with data show decreasing of mean pulmonary arterial pressure and pulmonary vascular resistance, endothelin receptor also show increasing in clinical and hemodynamic parameters on the patients. Phosphodiesterase-5 inhibitor also showed beneficial effect on dyspneu symptom and functional class. Caution should be used in HIV-infected patients receiving a HAART regimen containing protease inhibitor, as saquinavir and ritonavir, which have been shown increasing sildenafil plasma concentration of drug and metabolites.[4,5,7,8]

There are still conflicting data regarding the role of HAART in the management of patients with HIV-PAH. Several experts suggested that HAART does not prevent development of PAH in HIV infected patients and some suggested that HAART could delay or attenuate development of PAH in HIV-infected patients.[4,5,7]

CONCLUSION

This case reports a nine year-old patient with HIV-PAH. It highlights initial diagnosis and treatment may improve functional class and symptom.

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PETUNJUK PENULISAN NASKAH

Naskah ditulis dalam Bahasa Inggris, diketik dengan format kertas ukuran A4 dengan jarak bingkai 3 cm dari sisi tepi, jarak baris 2 spasi. Jenis huruf Arial 11. Halaman pertama naskah memuat judul artikel, nama dan alamat penulis. Jarak baris 1 spasi digunakan pada abstrak *(abstract)*, tabel, keterangan tabel, keterangan gambar dan daftar pustaka.

Abstrak berisi tujuan, metode penelitian, hasil penelitian dan kesimpulan, maksimum 200 kata, kata kunci maksimum 5 kata disusun menurut abjad huruf. Abstrak harus ditulis dalam Bahasa Inggris.

Grafik dibuat dengan menggunakan Program MS Excel, tanpa menggunakan latar belakang dan bingkai. Grafik harus jelas dan mudah dibaca. Grafik garis diberi simbol yang jelas untuk membedakan antar objek pengamatan. Garis pada grafik berukuran 1 point. Grafik bar diberi warna gradasi hitam, atau diisi efek yang berbeda untuk membedakan objek pengamatan. Simbol dapat digunakan untuk memperjelas keterangan pada gambar atau grafik.

Gambar peta digambar menggunakan program computer (Corel, Illustrator, Adobe, dll), disimpan dalam bentuk JPEG. Informasi penting yang disajikan misalnya nama lokasi, skala, arah aliran harus akurat.

Tabel dibuat tanpa garis vertikal pemisah kolom dan tanpa nomor kolom. Garis horizontal pada table hanya pada baris pertama (judul kolom), akhir tabel. Bilangan satuan dan pecahan menggunakan tanda pemisah koma, jumlah angka digit di belakang koma disamakan untuk kolom yang sama.

Foto dibuat dalam bentuk JPEG dengan resolusi rendah, namun ketika direduksi pada ukuran cetak lebar 8 cm atau 16 cm informasi yang disajikan masih jelas terbaca. Foto dicetak pada kertas mengkilat, jelas dan tidak kabur. Foto berwarna sedapat mungkin dihindari. Bila foto berwarna, sedapat mungkin menggunakan warna yang kontras antara latar belakang dan objeknya. Warna latar belakang gelap (hitam) atau terang (putih).

Tabel, grafik dan foto diberi nomor urut, judul dan keterangan serta diletakkan pada lembaran terpisah teks.

Nama latin (binomial) ditulis dengan huruf bercetak miring *(Italic)*. Satuan ukuran menggunakan Sistem Satuan Internasional.

Susunan Naskah

Naskah disusun sebagai berikut:

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3. *Abstract.*
4. Kata kunci *(Key words)*
5. Pengantar *(Introduction).*
6. Bahan dan Metode *(Material and Method)*. Ditulis dengan rinci dan jelas. Alat analisis dan bahan tertentu ditulis asal usulnya.
7. Hasil (*Result*).
8. Pembahasan *(Discussion).*
9. Kesimpulan *(Conclusion).*
10. Saran *(Recommendation)*. Boleh tidak ditulis/*Optional.*
11. Ucapan terima kasih *(Acknowledment).*
12. Daftar Pustaka *(References)*, disusun menurut urutan tampil dalam naskah dengan angka.

Daftar pustaka dari jurnal, majalah atau bulletin ditulis dengan urutan sebagai berikut: nomor urut, nama pengarang, tahun terbit, judul, nama jurnal/-majalah/bulletin (disingkat dalam bentuk baku), volume dan nomor, halaman pertama hingga terakhir. Pengarang ditulis secara lengkap sesuai jumlahnya. Jika karangan berikutnya diterbitkan oleh pengarang yang sama dalam tahun yang sama, maka pada tahun penerbitan ditambahkan huruf a, b, c dan seterusnya.

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