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Unravelling the Link: A Case Series of Pulmonary Arterial Hypertension in Systemic Lupus Erythematosus

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Introduction

The reported prevalence of systemic lupus erythematosus (SLE) associated pulmonary arterial hypertension (SLE-PAH) varies between 0.5 to 17.5% [1]. It is the second most common connective tissue disease (CTDs) associated with PAH after scleroderma [2]. The gold standard for diagnosis is a mean pulmonary arterial pressure (mPAP) ≥20 mmHg, via right heart catheterization (RHC), or a pulmonary artery systolic pressure (PASP) ≥40 mmHg, measured via transthoracic echocardiogram (TTE) [1].

Case Description

We reported a case series of 5 patients (age 20-47) with SLE-PAH from our centre who presented from December 2016 to February 2025. The risk factors present, diagnosis, and response to treatments were assessed. Among clinical presentation which were variable included dry cough, dyspnea, failure symptoms, frothy urine, vasculitis, and serositis (pericardial effusion) as well as other disease manifestations in SLE. Diagnosis of SLE-PAH was made following combination of clinical presentation, ECHO, and NT-proBNP reading. Highest documented PASP on TTE was > 80mmHg with significantly raised pro-BNP. Two of these patients underwent the RHC which one was consistent with Group I PAH. Among the risk factors of SLE-PAH observed were presence of Raynaud's phenomenon, lupus nephritis, pericardial effusion, vasculitis, positive anti-phospholipid antibodies, positive anti-u1 ribonucleoprotein or positive anti-Ro antibody. Four of them received a single pulmonary vasodilator which was a PDE-5 inhibitor. All of them responded clinically to immunosuppressive treatments either with high dose steroid pulse (IV methylprednisolone) or in combination with cyclophosphamide (CYC) or mycophenolate mofetil (MMF). Repeated TTE showed reduction of PASP from the baseline in two of these patients with resolution of symptoms in all patients. Table 1 summarized the clinical characteristics and their response to treatment.

Table 1: Summary of key features and treatment

No	Age/ Gender	Key Features	ECHO	RHC	NT-proBNP (pg/mL)	Treatment	Outcome
1	20/ F	Pericardial effusion Lupus Nephritis	PASP 73mmHg	Not available	9190	MTP CYC MMF Sildenafil	Clinical: NYHA III > I NT-proBNP: 2749 PASP 45mmHg
2	28/ F	Raynaud's Phenomenon Pericardial effusion Lupus Nephritis Triple positive APS Ab	PASP 41mmHg	Not available	7850	MTP MMF	Clinical: NYHA III > I-II
3	47/ F	Pericardial effusion Lupus Nephritis APS Antibody positive Raynaud's Phenomenon Vasculitis Anti-Ro Ab positive Anti-U1RNP Ab positive	PASP 80mmHg	Not available	2620	MTP MMF Sildenafil	Clinical: NYHA III > I
4	38/ F	Pericardial effusion Lupus Nephritis	PASP 63mmHg	normal study	1895	MTP MMF MTX Sildenafil	Clinical: NYHA III > I
5	39/ F	Triple pos APS Ab Raynaud's Phenomenon Vasculitis Anti-Ro Ab positive Anti-U1RNP Ab positive	PASP 66mmHg	Group I PAH	214	MTP AZA MMF Sildenafil	Clinical: NYHA III > I PASP 45mmHg

Discussion

TTE has been shown to provide comparable measurements of PASP to RHC hence used as a predictor of SLE-PAH and treatment response assessment [1,3]. Among all the risk factors studied, positive anti-u1 ribonucleoprotein was independently associated with severe PAH and more active disease [4-5]. Digital vasculitis is independently linked to improvement in SLE, while pericardial effusion is associated with SLE deterioration and longer PAH duration [4-5]. SLE-PAH has been found to respond to high dose steroid and other immunosuppressants like CYC, MMF, and Rituximab with or without the use of pulmonary vasodilators [1,6]. It also has best rates for 1-year survival compared to scleroderma and mixed connective tissue disease among the CTDs group [1,6].

Conclusion

SLE-PAH can be diagnosed through TTE before confirming it via RHC. Risk factors for SLE-PAH like vasculitis, pericardial effusion, positive APS antibodies, positive anti-u1 ribonucleoprotein, positive anti-RO antibody, and serositis should be identified and assessed. Prompt initiation of treatment is key to avoid its associated high morbidity and mortality, given its responsiveness to high dose steroid and immunosuppressants.

References :
1) Tselios, K., Gladman, D. D., & Urowitz, M. B. Systemic lupus erythematosus and pulmonary arterial hypertension: links, risks, and management strategies. Open Access Rheumatology: Research and Reviews 2016; 9, 1–9. https://doi.org/10.2147/OARRR.S123549
2) Hachulla E et al. Pulmonary Arterial Hypertension Associated With Systemic Lupus Erythematosus: Results From the French Pulmonary Hypertension Registry, Chest, Volume 153, Issue 1,2018, Pages 143-151, ISSN 0012-3692, https://doi.org/10.1016/j.chest.2017.08.014.
3) Lei Y, Zhang X, Feng Y, Wang J, Luo R. Risk factors of pulmonary arterial hypertension in patients with systemic lupus erythematosus. Cardiology in the Young. 2021;31(10):1619-1624.
4) Huang, C, Li, MT, Liu, YT, et al. Baseline characteristics and risk factors of pulmonary arterial hypertension in systemic lupus erythematosus patients. Medicine 2016; 95: e2761
5) Chow, S, Chandran, V, Fazelzad, R, Johnson, S. Prognostic factors for survival in systemic lupus erythematosus associated pulmonary hypertension. Lupus 2012; 21: 353–364.
6) Tanaka E et al. Pulmonary hypertension in systemic lupus erythematosus: evaluation of clinical characteristics and response to immunosuppressive treatment. J Rheumatol. 2002;29:282–287.