

# INPLASY PROTOCOL

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None declared.

## Survival and prognosis analysis of systemic lupus erythematosus- pulmonary hypertension: a protocol for systematic review and meta-analysis

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**Review question / Objective:** The study aimed to evaluate survival rates and prognosis in systemic lupus erythematosus (SLE) patients with pulmonary hypertension (PH) using meta-analysis. (P: patients with SLE-PH; I: No intervention; C: No comparator; O: survival and prognosis; S: meta-analysis).

**Condition being studied:** Pulmonary hypertension (PH) is a life-threatening condition characterized by elevated pulmonary arteries pressure due to increased pulmonary vascular resistance<sup>1</sup>. Symptoms of PH are nonspecific but typically include exertional dyspnea and fatigue. Systemic lupus erythematosus (SLE) is characterized by aberrant immune activity leading to variable clinical manifestations ranging from mild fatigue and joint pain to severe and life-threatening organ damage. Recent data from lupus registries have provided more accurate estimates of SLE incidence and prevalence, which showed Lupus is more common in non-white populations.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 06 April 2023 and was last updated on 06 April 2023 (registration number INPLASY202340017).

\* Yang, JG and Zhao, FY have contributed equally to this work.

### INTRODUCTION

**Review question / Objective:** The study aimed to evaluate survival rates and prognosis in systemic lupus erythematosus (SLE) patients with pulmonary hypertension

(PH) using meta-analysis. (P: patients with SLE-PH; I: No intervention; C: No comparator; O: survival and prognosis; S: meta-analysis).

**Rationale:** In recent years, the combination of PH and SLE has become more intriguing, as PH is one of the leading causes of death in SLE patients and may be difficult to diagnose because it can be caused by heart failure, pulmonary thromboembolism, hypoxia, or respiratory failure. However, there are still no widely accepted clinical treatment and management guidelines for SLE-PH patients, nor is there unified data on survival and mortality. Therefore, we conducted a meta-analysis of the survival and prognosis of this patient population to analyze the relevant clinical data to obtain a relatively comprehensive result.

**Condition being studied:** Pulmonary hypertension (PH) is a life-threatening condition characterized by elevated pulmonary arteries pressure due to increased pulmonary vascular resistance<sup>1</sup>. Symptoms of PH are nonspecific but typically include exertional dyspnea and fatigue. Systemic lupus erythematosus (SLE) is characterized by aberrant immune activity leading to variable clinical manifestations ranging from mild fatigue and joint pain to severe and life-threatening organ damage. Recent data from lupus registries have provided more accurate estimates of SLE incidence and prevalence, which showed Lupus is more common in non-white populations.

## METHODS

**Search strategy:** The search was conducted across English and Chinese electronic databases, including PubMed, EMBASE, Cochrane Central Register of Controlled Trials(CENTRAL), China National Knowledge Infrastructure (CNKI), China Science and Technology Journal Database (VIP Information Network), WanFang Database and Chinese Biomedical Database (CBMD) to identify relevant literature on survival and prognosis factors in SLE. A search strategy was developed using Medical Subject Headings (MeSH) including: “Systemic Lupus Erythematosus”, “Lupus Erythematosus Disseminatus”, “Libman-Sacks Disease”, “Disease, Libman-Sacks”, “Libman Sacks

Disease”, “Pulmonary Hypertension”, “survival” and “Prognosis”.

**Participant or population:** Patients with systemic lupus erythematosus (SLE) and pulmonary hypertension (PH).

**Intervention:** No intervention.

**Comparator:** No comparator.

**Study designs to be included:** Studies meeting the following criteria were included: (1)Targets population of the enrolled studies were patients with SLE and PH. Studies were included in this article if its population were CTD-PH in which SLE-PH subgroup data could be separated. (2)Studies involving 1-, 3- and 5-year survival rates and prognostic factors. (3)Prospective and retrospective cohort studies. Patients with PH diagnosed using echocardiography were also eligible for inclusion.

**Eligibility criteria:** We do not define any additional inclusion or exclusion criteria not defined in the PICOS sections.

**Information sources:** Databases: The search was conducted across English and Chinese electronic databases, including PubMed, EMBASE, Cochrane Central Register of Controlled Trials(CENTRAL), China National Knowledge Infrastructure (CNKI), China Science and Technology Journal Database (VIP Information Network), WanFang Database and Chinese Biomedical Database (CBMD) to identify relevant literature on survival and prognosis factors in SLE-PH.

**Main outcome(s):** Survival and prognosis information.

**Data management:** We used single-group rate meta-analyses to evaluate pooled 1, 3, and 5-year survival in patients with SLE-PH. The prognostic factor data is overly fragmented, as the studied prognostic factors are not uniform across regions. Moreover, numerous studies have analyzed prognostic factors in CTD-PH patients rather than SLE-PH patients. Therefore,

only descriptive analyses of prognostic factors were performed.

The heterogeneity test was performed with inconsistency index ( $I^2$ ) and Q statistic. The random effects model was used when an obvious heterogeneity was obvious between the included studies ( $I^2 > 50\%$ ). The fixed effects model was used when no significant heterogeneity between the included studies ( $I^2 \leq 50\%$ ). Subgroup analysis was used to analyze the heterogeneity further. Sensitivity analyses were performed by sequentially omitting individual studies. The results were to be presented with 95% confidence intervals and forest plots. Publication bias was assessed with the Egger test and was represented graphically by a funnel plot. All analyses were processed using the statistical software R 4.2.2 and the meta/metafor package.

#### Quality assessment / Risk of bias analysis:

The Newcastle-Ottawa (NOS) Scale was used to assess the quality of each study. We collected relevant information for quality assessment while conducting the full-text reading and designed tables to record these data.

**Strategy of data synthesis:** FT double arcsine transformation was used to stabilize the data through R language, and then the 1-, 3-, and 5-year survival data were integrated.

**Subgroup analysis:** We conducted a subgroup analysis according to which method was used for the diagnosis of PH. The next task was to conduct a subgroup analysis of studies in different regions. An additional subgroup analysis was performed based on the year of publication.

**Sensitivity analysis:** Sensitivity analyses were performed by sequentially omitting individual studies.

**Language restriction:** We searched only Chinese and English databases.

**Country(ies) involved:** China (Shandong University of Traditional Chinese Medicine).

**Keywords:** SLE, PH, survival rate, prognosis.

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