

## Risk Of Venous Thromboembolism In Patients With Systemic Sclerosis: A Systematic Review And Meta-Analysis

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**Background/Purpose:** Deep venous thrombosis (DVT) and pulmonary embolism (PE), collectively known as venous thromboembolism (VTE), are common problems associated with significant morbidity and mortality. Chronic inflammation, though not generally regarded as traditional risk factor for VTE, is increasingly recognized as a potential predisposing factor. In fact, several chronic inflammatory disorders, such as rheumatoid arthritis and idiopathic inflammatory myopathy, have been shown to increase rates of VTE in large epidemiologic studies. However, the data on systemic sclerosis (SSc), a relatively uncommon chronic inflammatory disorder, remain unclear due to conflicting studies. To further investigate this possible association, we conducted a systematic review and meta-analysis of observational studies that compared the risk of VTE in patients with SSc versus those without it.

**Methods:** Two investigators (N.S. and P.U.) independently searched published studies indexed in MEDLINE, EMBASE and the Cochrane database from inception to April 2014 using the terms for systemic sclerosis in conjunction with the terms "venous thromboembolism", "pulmonary embolism" and "deep venous thrombosis". A manual search of references of retrieved articles was also performed. The inclusion criteria were as follows: (1) observational studies published as original studies to evaluate the association between SSc and VTE and (2) odds ratios (OR's), relative risk (RR's) or hazard ratio (HR's) or standardized incidence ratio (SIR's) with 95% confidence intervals (CI's) were provided. Study eligibility was independently determined by the two investigators noted above. Newcastle-Ottawa scale was used to assess the quality of included studies.

RevMan 5.2 software was used for the data analysis. Point estimates and standard errors were extracted from individual studies and were combined by the generic inverse variance method of DerSimonian and Laird. Given the high likelihood of between study variance, we used a random-effect model rather than a fixed-effect model. Cochran's Q test was used to determine the study's statistical heterogeneity.

**Results:** Out of 348 potentially relevant articles, four studies (three retrospective cohort studies and one case-control study) were identified that met the above criteria and were included in our analysis. The pooled risk ratio of VTE in patients with SSc is 1.89 (95% CI, 1.47 to 2.42). The statistical heterogeneity of this meta-analysis was high with an I<sup>2</sup> of 78 %.

**Conclusion:** Our study demonstrates an increased risk of VTE among patients with SSc. Clinicians should consider VTE when a patient with SSc presents with extremity and/or respiratory symptoms.

This abstract is funded by: None

Am J Respir Crit Care Med 191;2015:A4877

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Online Abstracts Issue

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