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## Risk Of Venous Thromboembolism In Patients With Ankylosing Spondylitis: 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 medical conditions with a significant morbidity and mortality. Chronic inflammatory state, though is not generally viewed as a traditional risk factor for VTE, is increasingly recognized as its predisposing factor as several chronic inflammatory disorders, such as rheumatoid arthritis and psoriasis, have been shown to increase VTE risk in large epidemiological studies. However, the data on ankylosing spondylitis (AS), a chronic inflammatory arthritis commonly seen in young male, remain unclear due to conflicting studies. Thus, 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 AS versus participants without it.

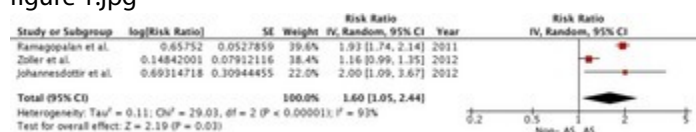
**Methods:** Two investigators (P.U. and N.S.) independently searched published studies indexed in MEDLINE and EMBASE from inception to July 2014 as well as the American College of Rheumatology conference abstract database using the terms for ankylosing spondylitis in conjunction with the terms "venous 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 study or abstract to evaluate the association between AS 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 5.3 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 128 potentially relevant articles, three studies (two retrospective cohort studies and one case-control study) were identified and included in our data analysis. The pooled risk ratio of VTE in patients with AS was 1.60 (95% CI, 1.05 to 2.44). The statistical heterogeneity of this meta-analysis was high with an  $I^2$  of 93%.

**Conclusion:** Our study demonstrated a statistically significant increased risk of VTE among patients with AS.

figure 1.jpg



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