Safety and immunogenicity of tetanus/diphtheria vaccination in patients with rheumatic diseases - a prospective multi-centre cohort study


OBJECTIVES
We aimed to assess the safety and immunogenicity of a diphtheria/tetanus vaccine booster dose in three different patient groups with rheumatic diseases on a variety of immunosuppressive/immunomodulatory medications compared with healthy controls (HCs).

METHODS
We conducted a multi-centre prospective cohort study in Switzerland. We enrolled patients with RA, axial SpA/PsA, vasculitis (Behçet's disease, ANCA-associated vasculitis) and HCs. Diphtheria/tetanus vaccination was administered according to the Swiss vaccination recommendations. Blood samples were drawn before vaccination, and 1 month and 3 months afterwards. Antibody concentrations against vaccine antigens were measured by ELISA. Immunogenicity was compared between patient and medication groups. A mixed model was applied for multivariate analysis. Missing data were dealt with using multiple imputation.

RESULTS
Between January 2014 and December 2015, we enrolled 284 patients with rheumatic diseases (131 RA, 114 SpA/PsA, 39 vasculitis) and 253 HCs. Of the patients, 89% were on immunosuppressive/immunomodulatory medication. Three months post-vaccination 100% of HCs vs 98% of patients were protected against tetanus and 84% vs 73% against diphtheria. HCs and SpA/PsA patients had significantly higher responses than RA and vasculitis patients. Assessing underlying diseases and medications in a multivariate model, rituximab was the only factor negatively influencing tetanus immunogenicity, whereas only MTX treatment had a negative influence on diphtheria antibody responses. No vaccine-related serious adverse events were recorded.

CONCLUSION
Diphtheria/tetanus booster vaccination was safe. Tetanus vaccination was immunogenic; the diphtheria component was less immunogenic. Vaccine
responses were blunted by rituximab and MTX.

TRIAL REGISTRATION