

Immunogenicity and Safety of Routine Vaccines in Children and Adolescents with Rheumatic Diseases on Immunosuppressive Treatment A Systematic Review

Michèle Keller

Master thesis in Medicine

Background: The immunogenicity of vaccines in children with juvenile autoimmune rheumatic diseases (JARs) can be reduced, there are additional safety concerns around vaccination and there is a potential for worsening in disease activity. In this systematic review, we summarise studies that investigated the immunogenicity and safety of routine vaccines in children and adolescents with JARD on immunosuppressive treatment.

Methods: A systematic search was done using MEDLINE over the Ovid interface to identify original studies investigating vaccine antibody responses and safety of routine vaccines in children with JARD on immunosuppressive treatment.

Results: We identified 37 studies investigating 2,571 children and adolescents with JARD on immunosuppressive treatment and 4,895 control children. Overall, 56 geometric mean antibody titres were measured in children with JARD on immunosuppressive treatment of which 19 (34%) were lower, six (11%) higher and 31 (55%) similar compared with control children. Of the 39 seroprotection rates measured, 10 (26%) were lower, two (5%) higher and 27 (69%) similar in the two groups. Of the 27 seroconversion rates measured, nine (33%) were lower, two (8%) higher and 16 (59%) similar in children with JARD compared with control children. However, many of the studies were underpowered, and not designed to show non-inferiority between children with JARD and controls. Severe adverse events were reported in 38 children (33 with juvenile idiopathic arthritis, four with systemic lupus erythematosus and one in a healthy child), most of them were likely not related to the vaccination (e.g. elective hospitalisations and surgeries). A worsening in disease activity was reported in 44 (2%) children with JARD on immunosuppressive treatment, again many of them were likely not related to the vaccination.

Conclusion: Vaccination in children with JARD on immunosuppressive treatment is safe and should be promoted, especially since these children are at increased risk for infection. The importance for the completion of vaccination schedules should be stressed. Strategies to compensate for the lower vaccine responses, which are found in approximately one third of these children, include measuring antibody levels to determine the optimal timing for the administration of additional booster doses.

Director: Dr Petra Zimmermann, Faculty of Science and Medicine, University of Fribourg