

Omondi C

*Jaramogi Oginga Odinga Teaching and Referral Hospital, Kisumu, Kenya and School of Medicine, Uzima University, Kisumu, Kenya.
Email: gomondii@yahoo.com*

Abstract

Background: The Covid-19 pandemic began in Wuhan, China in the late 2019 and spread rapidly all over the world. The pandemic brought about medical challenges to patients with rheumatic autoimmune disease. There were concerns on whether the Covid-19 disease would impact negatively on rheumatic autoimmune diseases outcomes and also whether the vaccination could impact the rheumatic diseases negatively. The other concern was whether the drugs used in management of rheumatic autoimmune diseases would negatively impact the Covid-19 vaccination outcomes.

Objective: To review our understanding of the effect of rheumatic autoimmune disease and DMARDs on Covid-19 vaccination outcomes.

Data source: Available publication databases including but not limited to PubMed, Embase, Scopus were searched for publications related to Covid-19 vaccination in rheumatic autoimmune disease and the articles were reviewed by the author.

Conclusion: Limited data was available on the impact of rheumatic autoimmune disease and DMARD use on Covid-19 vaccination outcomes.

Key words: Covid-19, Autoimmune rheumatic disease, Vaccination, Outcomes, Challenges, Guidelines

Introduction

The Covid-19 pandemic began in Wuhan, China in the late 2019. In view of the pandemic, there is an unmet clinical need for guidelines on vaccination of patients with Autoimmune Inflammatory Diseases (AIIRD)¹. The definition of AIIRD in this review predominantly includes but not limited to Spondyloarthritis (SpA), Systemic Lupus Erythematosus (SLE), Connective Tissue Diseases (CTD) and systemic vasculitides.

Critical issues to consider

Points to consider concerning vaccination against Covid-19 in AIIRD include:

- (i) Whether the risk to contract Covid-19 is increased among AIIRD patients
- (ii) Whether Covid-19 disease is severe in AIIRD patients
- (iii) Whether Covid-19 is associated with rheumatic and autoimmune manifestations
- (iv) Which vaccines against Covid-19 are available?
- (v) The possible safety issues of Covid-19 vaccine in AIIRD patients.
- (vi) Whether the vaccines available are effective in patients in AIIRD patients.

Covid-19 outcomes in AIIRD

Systematic reviews have reported a mild increase in the prevalence of Covid-19 among patients with AIIRD^{2,3}. The data from Global Rheumatology Alliance (GRA) analysed 3,000 patients with AIIRD⁴. It reported an increased risk of hospitalization (46%) and death (9%) among patients with SLE and vasculitides⁴. However, for the whole population of patients with AIIRD, the main risk factors for hospitalization were similar to those already known in the general population including age and cardiovascular disease⁴. Other risk factors in AIIRD included: high disease activity, treatment with glucocorticoids (>10mg/day prednisolone equivalent dose), rituximab use and some immunosuppressants (azathioprine, cyclophosphamide, mycophenolate, cyclosporin) were related to a higher rate of Covid 19 related deaths⁵.

Recent meta-analysis on rheumatic manifestations of Covid-19 included 51 articles⁶. Myalgia and fatigue have been reported in 16% and 36% respectively in patients with Covid-19⁶. Case reports of autoimmune cytopenias⁷ and Guillain-Barre Syndrome⁸ and autoimmune encephalitis⁹ have been published.

Covid-19 may include antinuclear antibodies, anti-SSA and anti-phospholipid antibodies in a large proportion of Covid-19 patients¹⁰.

Covid-19 vaccination in AIIRD

There is generally limited information on the adverse effects of Covid-19 vaccine in patients with AIIRD¹¹. Most studies excluded patients with AIIRD except phase 3 trial of BNT 162b2 vaccine which included 118 patients with rheumatic diseases¹². One study reported a low level of flare (4%) of rheumatic diseases about 6 days with a Covid-19 vaccine¹³. Another study reviewed outcomes of 6 vaccines¹⁴. Available evidence has shown that Covid-19 vaccination among patients with Spondyloarthritis (SpA) among other AIIRD to be effective, and safe even with DMARD use¹⁵.

Various recommendations and guidelines have been developed by professional organisations regarding management of AIIRD during the Covid-19 pandemic. These include European Alliance of Association for Rheumatology (EULAR)¹⁶, American College of Rheumatology (ACR)¹⁷ and National Psoriasis Foundation¹⁸. Treatment with TNF inhibitors does not pose a general risk to humoral responses in most SpA patients but their use in patients with IBD associated arthritis may alter immune responses to vaccines¹⁹. Limited evidence suggests that use of MTX and JAK inhibitors in patients with AIIRD may interfere with vaccine responses hence the recommended treatment modification advised by ACR¹⁷. Prednisolone >10mg equivalent dose²⁰, MTX²¹, and mycophenolate²² were associated with decreased humoral responses. Rituximab was associated with significantly reduced humoral responses²¹. IL-6 receptor inhibitors were associated with unimpaired humoral responses²³, while abatacept showed inconsistent data²⁴. Having discussed all the above, it is important to note that physician recommendation was the main factor in vaccine acceptance²⁵.

Despite the challenges of DMARDs in Covid-19 vaccination, the interleukin-6 inhibitor, tocilizumab has been shown to reduce need for mechanical ventilation and mortality in patients with severe Covid-19 disease²⁶. Finally, the African League Against Rheumatism (AFLAR) have developed guidelines for the management of rheumatic diseases during the Covid-19 pandemic²⁷ which rheumatologists working in Africa would be advised to understand and follow.

Conflict of interest: The author declares no conflict of interest.

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