Mycophenolate versus Methotrexate in Non-infectious Ocular Inflammatory Disease: A Systematic Review and Meta-Analysis

Mohammad Karam[1,2], Abdulmalik Alsaif[1,3], Abdulrahman Al-Naseem[4], Amrit Hayre[1,5], Abdurrahman Al Jabbouri[6], Ahmed Aldubaikhi[7], Narvair Kahlar[1,8] and Salem Al-Mutairi[9,10]

UNIVERSITY OF LEEDS

1 School of Medicine, University of Leeds, Leeds, UK. 2 Farwaniya Hospital, Ministry of Health, State of Kuwait. 3 Walsall Healthcare NHS Trust, West Midlands, UK. 4 School of Medical Sciences, University of Manchester, Manchester, UK. 5 Whittington Health NHS Trust, London, UK. 6 Department of Ophthalmology, St James's University Hospital, Leeds, UK. 7 College of Medicine, King Saud Bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia. 8 Sandwell and West Birmingham Hospitals NHS Trust, West Midlands, UK. 9 Senior Consultant Ophthalmic Surgeon (M.D, FRCSC, External Eye Diseases, Cornea, Refractive Surgery and Uveitis), Head of Uveitis Unit, Al-Bahar Eye Center, Ministry of Health of Kuwait, State of Kuwait. 10 Program Director of Kuwait Board of Ophthalmology, Kuwait Institute of Medical Specialities (KIMS), State of Kuwait.

Introduction:

Non-infectious ocular inflammatory disease (NIOID) is associated with increased risk of complications, such as cataracts, glaucoma and retinal detachment[1]. High dose corticosteroid therapy is currently considered the first step in managing ocular inflammation. However, corticosteroid sparing therapy using immunosuppressives such as methotrexate (MTX) or mycophenolate mofetil (MMF) has become increasingly utilized[2]. Several studies have compared the effectiveness of MTX and MMF in the treatment of NIOID, but no meta-analysis conducted to date [3–6].

Aim:

To compare the outcomes of MMF versus MTX in NIOID.

Methods:

- A systematic review and meta-analysis as per PRISMA guidelines.
- Primary outcomes included treatment outcomes and side effects.
- Secondary outcomes included changes in visual acuity and resolution of macular oedema.
- Review Manager 5.3 software was used for data synthesis.

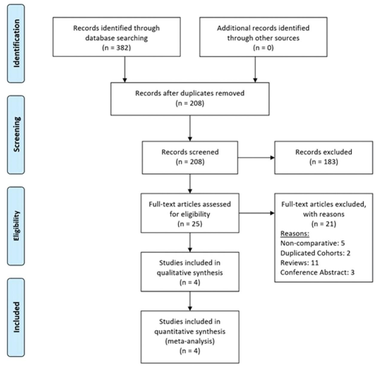


Figure 1: Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Flow Diagram. The PRISMA diagram details the search and selection processes applied during the overview.

Results:

- Study Sample: Four studies enrolling 905 patients were identified.
- Primary Outcomes:
  - Treatment result at 6 months
    - Overall Success: no significant difference (OR = 0.97, CI = 0.32 to 2.92, P = .96); figure 2
    - Success by anatomic location of uveitis:
      - Anterior & intermediate: no significant difference (OR = 2.33, CI = 0.75 to 7.21, P = .14); figure 3
      - Posterior: statistically significant difference demonstrating a higher rate of treatment success for the MTX group (OR = 0.41, CI = 0.23 to 0.74, P = .003); figure 4
    - Treatment failure: no significant difference (OR = 0.86, CI = 0.18 to 4.10, P = .85); figure 5
  - Side effects
    - Laboratory: no significant difference in liver enzymes elevation & bone marrow suppression.
    - Systemic: no significant difference in fatigue, headache, fever, gastrointestinal upset and infections.
    - Ocular: no significant difference in ocular hypertension, glaucoma, cataracts, vitreous hemorrhages, retinal detachment, eye pain, and decreased vision
- Secondary Outcomes:
  - Visual Acuity: no significant difference
  - Resolution of Macular Oedema: no significant difference

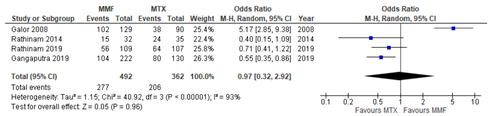


Figure 2: Forest Plot for Odds Ratio of Mycophenolate versus Methotrexate – Overall Treatment Success of Non-Infectious Ocular Inflammation at 6 Months.

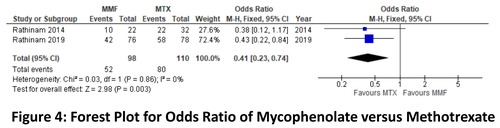


Figure 4: Forest Plot for Odds Ratio of Mycophenolate versus Methotrexate – Treatment Success of Posterior Uveitis or Panuveitis at 6 months.

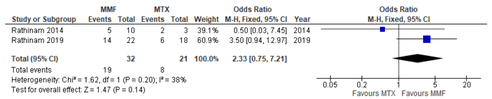


Figure 3: Forest Plot for Odds Ratio of Mycophenolate versus Methotrexate – Treatment Success of Anterior and Intermediate Uveitis at 6 months.

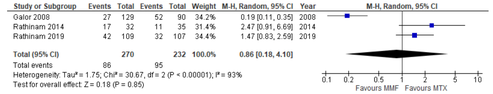


Figure 5: Forest Plot for Odds Ratio of Mycophenolate versus Methotrexate – Treatment Failure of Non-Infectious Ocular Inflammation at 6 Months.

Conclusion:

The findings of this meta-analysis have concluded that the application of MMF as a treatment for NIOID is not significantly different from the treatment of MTX. However, MTX produced improved treatment success when used in posterior and panuveitis cases, which could potentially be due to the different mechanisms of action of each drug. The authors suggest that further clinical studies need to be performed to conclude the comparative effectiveness of both MTX and MMF in treating NIOID and to investigate whether the effectiveness changes based on the anatomical subtype of uveitis.

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Correspondence:
Mohammad Karam
mhk130@outlook.com
AlBahar Eye Center, Ibn Sina Hospital, State of Kuwait