Exclusion criteria:
- Files with incomplete information making it impossible to evaluate the severity of the injury;
- A history of angle grinding or welding;
- Chemical injuries.

The patients included who were not referred to ophthalmic evaluation were followed up by a questionnaire to detect possible misdiagnosis.

This study was made according to the guidelines of the Helsinki Declaration, and relevant approvals have been achieved. To our knowledge, this is the first study to report objective ocular signs found in an ER without access to specialized ophthalmonic instrumentation.

Twenty-four patients were included; 83% were men, 29% of the injuries were work related, and mean age was 36 years. Traumas with a history of hammering stone or metal comprised 37.5%, blunt traumas 25%, traumas with sharp objects 25% and 16% were projectile traumas.

Eighteen patients (75%) were admitted to an acute ophthalmonic evaluation. Six patients (25%) were not referred, all having a history of hammering metal or stone.

Objective signs among the group of patients referred to further examination (n = 18) were as follows: decreased VA (n = 14); irregular pupil (n = 4); no pupillary reaction to light (n = 4); hyphaema (n = 3); open injury visual to the naked eye (n = 2); and subconjunctival haemorrhage (n = 2) (Fig. 1). Patients not referred presented the following: subconjunctival haemorrhage (n = 1), injection of eye (n = 4) and fluorescein stain (n = 1) (Fig. 1).

During a 5-year period, there was not detected any misdiagnosis of patients with mechanical ocular trauma in a Danish ER without ophthalmic assistance. Our study shows that patients with a history of hammering stone or metal are only referred to an ophthalmonic examination if there are obvious signs of eye injury. Hammering, as in previous studies, has been found to be the most common mechanism in ocular traumas with an IOFB (Imrie et al. 2008; Nicoara et al. 2015). Therefore, we recommend that all patients with a history of hammering stone or metal undergo an ophthalmonic examination to decrease the risk of misdiagnosis.

References


Antinuclear and antiretinal antibodies in uveitis associated with active and latent tuberculosis

Rina La Distia Nora,1,2 Josianne CEM ten Berge,1 Aniki Rothova1 and Marco WJ Schreurs3

1Department of Ophthalmology, Erasmus University Medical Center, Rotterdam, the Netherlands; 2Department of Ophthalmology, University of Indonesia & Cipto Mangunkusumo Hospital Kirana, Jakarta, Indonesia; 3Department of Immunology, Erasmus University Medical Center, Rotterdam, the Netherlands

doi: 10.1111/aos.13707

Editor,

The pathogenesis of uveitis in the setting of active and latent tuberculosis (TB) is not entirely clarified. Next to genuine infection (Wroblewski et al. 2011), an important part of pathogenesis was attributed to (auto) immune reactions initiated by Mycobacterium tuberculosis (Mtb). Infection with Mtb can be associated with the production of diverse serum autoantibodies (Shen et al. 2013). Herein, we investigate the influence of (latent) TB on the presence of serum antinuclear and antiretinal autoantibodies (ANA and ARA) in Indonesian patients with uveitis.

Blood samples from patients with uveitis associated with active (not yet treated) pulmonary TB (N = 10) and uveitis of unknown cause (N = 85) were collected from June 2014 until May 2015. Classification of patients was performed according to SUN classification, and specific diagnoses were determined after the basic work-up for uveitis as indicated in our previous publication (La Distia Nora et al. 2017). The diagnosis of active pulmonary TB was based on clinical and/or microbiological and radiological findings (La Distia Nora et al. 2017). This study was performed with the approval of the local medical ethical committee.

All patients underwent Quantiferon-Tb Gold (QFT; Cellestis Inc., Carnegie, Australia). Screening for the presence of ANA using HEP-2 cells (Inova, San Diego, CA, USA) and the presence of ARA using primate retinal tissue (Euroimmun, Lubeck, Germany) was performed by indirect immunofluorescence as described before (Ten Berge et al. 2016). Logistic regressions with correction for age and gender were performed using srs (Version 23.0, Armonk, NY: IBM Corp) to analyse differences in the presence of ANA and ARA between the diagnosis groups.

Patients with uveitis of unknown cause were divided according to their QFT results in 58 patients with latent TB (QFT positive) and 27 patients without evidence of prior TB exposure (QFT negative). All QFT-positive patients were assessed by the pulmonologist and examined for the possible presence of pulmonary and extrapulmonary TB, but no cases of extrapulmonary involvement were found. The group with an unknown cause of uveitis and latent TB consisted of more female patients compared to the other groups (72% versus 30% in uveitis in the setting of active pulmonary TB group and 41% in the uveitis of unknown cause and QFT negative group, p-value 0.044) and older age patients (mean age 46 years versus 40 years in uveitis in the setting of active pulmonary TB group and 39 years in uveitis of unknown cause and QFT negative group, p-value 0.003). The median QFT value in patients with uveitis of unknown cause and latent TB was 5.0 IU/ml, and in patients with known TB-induced uveitis 1.7 IU/ml.

Patients’ serum ANA and ARA results are shown in Table 1. Patients with uveitis and either active or latent...
TB were characterized by high prevalence of systemic autoreactivity (ANA positive). In contrast, a higher proportion of organ-specific autoreactivity (ARA positive) was found in uveitis patients without evidence of any previous contact with Mtb. Induction of ANA, reported previously for active TB (Elkon & Casali 2008), apparently also occurs in latent TB. Interestingly, organ-specific autoreactivity (ARA) appears to be suppressed in both active and latent TB; however, the local production of ARA in ocular fluid samples was not investigated in this series. The presence of serum autoantibodies, directed against endothelial cells, and their decrease following treatment were reported in age-related macular degeneration (Kubicka-Trzaska et al. 2016). Unfortunately, we have no samples of our patients after they completed the treatment. Further studies are warranted to distinguish the pathogenesis of this selective systemic induction of autoreactivity in uveitis patients as a result of Mtb infection and its implication on disease course.

### References


### Antinuclear antibody profiling in uveitis

Josianne C. ten Berge, Fahriye Groen-Hakan, Aniki Rothova and Marco W.J. Schreurs

Antinuclear antibodies (ANA) are antibodies directed against a variety of nuclear antigens and are detected in patients with autoimmune diseases. Antinuclear antibodies (ANA) profiling is relevant for diagnostic purposes in various diseases, including systemic lupus erythematosus (SLE), Sjögren syndrome and systemic sclerosis (Smeenk et al. 1990; Hamaguchi 2010). In the past, ANA were also determined in all patients with uveitis for diagnostic screening purposes; however, this approach has been abandoned as its relevance in adult patients with uveitis was shown to be limited (Murray 1986). In the last decades, analysis of ANA has greatly improved and various subtypes and staining patterns are currently appreciated. Therefore, this study aimed to assess the presence, subtypes and titres of ANA in adult patients with uveitis of different aetiologies and re-evaluate its possible value for diagnostic screening in uveitis.

We conducted a prospective study at the Erasmus MC, University Medical Center Rotterdam and determined ANA profile (presence, titre, staining pattern and ANA subtype) in 105 consecutive adult patients with uveitis who underwent a standardized screening protocol for the cause of their uveitis between January 2016 and July 2017. In addition, all patients underwent a diagnostic screening protocol, which was related to the location of uveitis [according to the Standardization of Uveitis Nomenclature (SUN) Working Group]. A tailored approach was applied for further examinations. Clinical data from included patients were collected from medical charts. The study was performed in accordance with the Declaration of Helsinki and in agreement with the institutional regulations and approval of our institutional review board.

Screening for ANA was performed by standard indirect immunofluorescence

### Table 1. Prevalence of antinuclear and antiretinal antibodies in tuberculosis-induced uveitis and uveitis of unknown cause with positive or negative QuantiFERON-TB Gold outcomes.

<table>
<thead>
<tr>
<th></th>
<th>ANA positive</th>
<th>ARA positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>18.95 (19%)</td>
<td>39.87 (45%)</td>
</tr>
<tr>
<td>1. Uveitis in the setting of active pulmonary TB</td>
<td>5.10 (50%)</td>
<td>4.9 (44%)</td>
</tr>
<tr>
<td>2. Uveitis of unknown cause, QFT positive</td>
<td>12.58 (21%)</td>
<td>19.52 (37%)</td>
</tr>
<tr>
<td>3. Uveitis of unknown cause, QFT negative</td>
<td>1.27 (4%)</td>
<td>16.26 (62%)</td>
</tr>
<tr>
<td>p-value: 1 versus 2 versus 3</td>
<td>0.023</td>
<td>0.049</td>
</tr>
<tr>
<td>p-value: 1 versus 2</td>
<td>&gt;0.05</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>p-value: 2 versus 3</td>
<td>&gt;0.05</td>
<td>0.014</td>
</tr>
<tr>
<td>p-value: 1 + 2 versus 3</td>
<td>0.03</td>
<td>0.021</td>
</tr>
</tbody>
</table>

Serum ANA were more prevalent in patients with TB-induced uveitis (50%) than in patients with uveitis of unknown cause with latent TB (21%) or without latent TB (4%); p = 0.023. Prevalence of ARA was higher in QFT negative patients with unknown uveitis cause (62%) than in QFT-positive uveitis cases (p = 0.049). Prevalence of ARA or ANA did not differ between TB-induced uveitis and QFT-positive uveitis of unknown cause.

ANA = antinuclear antibodies, ARA = antiretinal antibodies, OR = odds ratio, QFT = QuantiFERON-TB Gold test.