Non-pharmacological and pharmacological interventions in patients with early arthritis: a systematic literature review informing the 2016 update of EULAR recommendations for the management of early arthritis

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ABSTRACT
Objective: To perform a systematic literature review (SLR) on pharmacological and non-pharmacological treatments, in order to inform the European League Against Rheumatism (EULAR) recommendations for the management of early arthritis (EA).

Methods: The expert committee defined research questions concerning non-pharmacological interventions, patient information and education, non-steroidal anti-inflammatory drug, glucocorticoid (GC) and disease-modifying antirheumatic drugs (DMARDs) use, as well as on disease monitoring. The SLR included articles published after the last EULAR SLR until November 2015 found in the MEDLINE, EMBASE and Cochrane databases and abstracts from the 2014 and 2015 American College of Rheumatology and EULAR conferences.

Results: Exercise programmes may improve pain and physical function in patients with EA. Patients with EA treated within the first 3 months of symptoms have better clinical and radiological outcomes than those treated beyond 3 months. The clinical and radiological efficacy of GCs is confirmed, with similar efficacy of oral and parenteral administrations. Long-term data raise concerns regarding cardiovascular safety when using GCs. Step-up DMARD therapy is as effective as intensive DMARD therapy 'ab initio' for the long-term outcome of EA. Short-term superiority of intensive therapy with bDMARDs is not maintained on withdrawal of bDMARD. Patients with early psoriatic arthritis have better skin and joint outcomes when tight control is used compared to standard care.

Conclusions: The findings confirm the beneficial effect of exercise programmes and the importance of early drug therapy and tight control. They support the use of methotrexate and GCs as first-line drugs, although the long-term use of GCs raises safety concerns.

Key messages
What is already known about this subject?
▸ Systemic glucocorticoids (GC) reduce pain and swelling and should be considered as part of the disease-modifying antirheumatic drugs strategy.
▸ Methotrexate is an effective and safe therapy in patients with early arthritis at risk of developing persistent disease.
▸ Targeting at early remission may lead to a better outcome than targeting at low disease activity.

What does this study add?
▸ GCs are efficacious drugs with regard to clinical and radiological outcomes, but their long-term use still raises safety concerns.
▸ Patients with early psoriatic arthritis have better skin and joint outcomes when tight control is used compared to standard care.
▸ Biomarkers to predict response to a first-line therapy are lacking.

How might this impact on clinical practice?
▸ This systematic literature review highlights the need for early treatment in patients with early arthritis with glucocorticoids and methotrexate. The long-term use of GCs still raises safety concerns.

INTRODUCTION
The management of patients with early arthritis (EA) has changed considerably in the past few years under the influence of new therapies. The latest version of the European League Against Rheumatism (EULAR) recommendations for the management of EA was published in 2007.1 A systematic literature review (SLR) underlying the 2007 EULAR


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recommendations had included studies published up to January 2005. However, between 2005 and 2015, many new studies in patients with EA have been published. In 2010, EULAR has published recommendations for the management of rheumatoid arthritis (RA) (updated in 2013 and 2016) and for the management of psoriatic arthritis. The aim of this SLR was to inform the update of the EULAR recommendations for EA management on new evidence for non-pharmacological interventions, patient information and education, and for pharmacological therapy in patients with EA.

METHODS
The expert committee selected the following topics of interest: the recognition (1) and referral (2) of patients with EA, the diagnosis of EA (3), its prognosis (4), its classification (5), patient information and education (6), non-pharmacological interventions (7), pharmacological treatments (8), monitoring of the disease course (9) and prevention (10). The research questions were framed, defined and structured according to the EULAR standardised operating procedures using the ‘Patients, Intervention, Comparator or Control, Outcome, Type of study (PICOT)-format’. The results of the SLR for recognition of arthritis, referral, diagnosis, prognosis and classification were summarised in a separate article. This article reports the results on non-pharmacological and pharmacological interventions, monitoring and prevention of EA.

Research questions
Research questions and PICOTs are provided in the online supplementary file.

Research questions dealing with non-pharmacological interventions aimed at addressing the clinical effects (disease activity and patient-reported outcomes) and radiological effects of exercise therapy. Impact of coping strategies, psychological intervention and strategies to promote DMARD adherence was also addressed. Influence of smoking cessation on early arthritis outcomes was assessed. Research questions dealing with non-steroidal anti-inflammatory drugs (NSAIDs) aimed at comparing the efficacy and safety of NSAIDs with those of simple analgesics.

Research questions dealing with glucocorticoids (GCs) aimed at assessing the efficacy and safety of systemic GCs (versus no GCs); of prolonged oral GCs versus parenteral GC administration; and of intra-articular GCs compared to no GCs.

Research questions dealing with DMARDs aimed at:
I. Finding evidence for the existence of a window of opportunity and for its optimal duration.
II. Establishing the efficacy and safety of a combination of conventional synthetic DMARDs (csDMARDs), targeted synthetic DMARDs (tsDMARDs) and biological DMARDs (bDMARDs) ‘ab initio’, as compared to csDMARD monotherapy.

III. Assessing predictive factors of response to first-line csDMARDs

For disease monitoring, we searched for randomised controlled trials (RCT) that had compared patients who were regularly monitored using a predetermined target level for disease activity versus patients who had not been treated according to such a tight monitoring strategy.

Study selection
A skilled librarian performed a systematic search of articles in the MEDLINE, EMBASE, Cochrane, Central, DARE, Health Technology Assessment and National Health Service databases. The start date was the lock date of the previous Cochrane or EULAR SLRs (depending on the topic of interest: between 2005 and 2013). The lock date of this SLR was November 2015. In addition, two fellows (CID and CH) manually searched the proceedings of the 2014 and 2015 American College of Rheumatology (ACR) and EULAR annual meetings for abstracts.

Inclusion criteria are described in online supplementary files according to PICOTs. All articles published in English were included. For efficacy and safety questions, only RCTs were included. Articles had to include adults (at least 18 years old) with a clinical diagnosis of EA or early RA. The detailed search strategies are presented in the online supplementary file.

Data extraction
Two fellows assessed each title and abstract for inclusion in the review, according to the predetermined selection criteria, followed by a full-text article review where applicable. Data regarding inclusion and exclusion criteria, follow-up time, characteristics of study population, outcome definition, interventions and outcome measures were extracted using a standardised data extraction form. Risk of bias was assessed using The Cochrane Collaboration's tool covering selection, performance, detection, attrition, reporting and other biases. Level of evidence, for each selected study, was determined according to the standards of the Oxford Centre for Evidence-Based Medicine.

RESULTS
Non-pharmacological interventions, information and education
Among the 1260 articles published after the latest SLR, only 2 met the inclusion criteria. Both suggested a benefit of exercise programmes on hand function (table 1).

Studies designed to assess the effect of smoking cessation as an intervention on EA outcomes were not found. Three studies compared outcomes in current versus former smokers, but this comparison did not allow any conclusion regarding the effect of smoking cessation as part of the therapeutic management of patients with EA.
We did not find studies addressing the effects of psychological interventions and strategies for promoting DMARD adherence.

The new RCTs are in accordance with the previously formulated standpoint that non-pharmaceutical interventions such as dynamic exercises can be applied as adjuncts to pharmaceutical interventions in patients with early arthritis.

**NSAIDs in EA**

Among 422 screened records, new RCTs assessing the efficacy of NSAIDs in patients with EA were not found.

**GCs in EA**

Among 350 screened records, 42 were fully reviewed and 7 RCTs and 1 meta-analysis met the inclusion criteria. The key efficacy data are shown in table 2.

**Efficacy of systemic GCs**

A recent meta-analysis of 10 trials with low-dose (≤10 mg/day prednisone) and 4 trials with high-dose GC regimens has shown a doubling of the likelihood of achieving 28-joint Disease Activity Score (DAS28)-remission in patients treated with GCs, as compared to those not treated with GCs (OR 2.46 (95% CI 1.51 to 4.00), 2.14 (1.40 to 3.27) and 3.54 (2.03 to 6.19) at 6, 12 and 24 months, respectively).

The CareRA RCT showed that patients without poor prognostic factors (see table 1) who took an oral GCs bridging therapy (COBRA-slim) did not have a statistically significant benefit in the DAS28 improvement and DAS28 remission rate at week 16 compared with patients treated with methotrexate (MTX) without oral GC. While this sub-analysis did not have sufficient statistical power and the study was not blinded, the primary end point (percentage of patients achieving remission at week 16) was numerically higher in the GC group (65.1% vs 46.8%, p=0.08).

**Efficacy of prolonged oral GCs as compared with parenteral GC administration**

The tREACH trial has suggested that oral prednisone with a tapering scheme over 10 weeks and a single subcutaneous injection with GCs leads to similar clinical and radiographic outcomes after 1 year.

**Efficacy of intra-articular GCs compared with no GCs**

One small RCT has shown higher ACR20/50/70 responses in patients who had received initial intra-articular injections of all swollen joints in addition to their usual DMARD use than in those who had not.

**Safety of systemic GCs**

The short-term safety of systemic GCs was assessed in two RCTs and one meta-analysis. In the meta-analysis of eight studies with low-dose GCs (≤10 mg/day) and four studies with high-dose GCs, the number of adverse events (AEs) was similar with and
without GCs, except for epigastric pain, which was more frequent with GCs (HR 1.76 (1.05 to 2.95)). In the CareRA trial, the proportion of patients with ‘serious-AEs’ or ‘any’ AEs at 4 months was similar in patients treated with and without GCs. In the tREACH trial, short-term safety was similar in patients treated with Intramuscular-GC administration or prolonged oral GCs.

Two studies reported long-term safety of GCs in early RA. Patients initially randomised to oral GCs 7.5 mg/day in BARFOT had an increased number of cerebrovascular events at 10 years (10/112) compared to those initially randomised to no GC group (5/111) (HR after adjustment for age: 3.7 (1.2 to 11.4)). Preliminary results from the CAMERA-II trial suggest that, after a mean follow-up of 7 years, cardiovascular events were more frequent in the early patients with RA treated with 10 mg/day prednisone (10/57) for at least 2 years than in the non-GC group (3/61; p=0.04).

The results of the latest RCTs are in accordance with the previously formulated standpoint that systemic GCs reduce pain and swelling and should be considered as adjunctive treatment, as part of the DMARD strategy and that intra-articular GC injections should be considered for the relief of local symptoms of inflammation. These RCTs also support the statement that, in view of their cumulative side effects, GCs should be used at the lowest dose necessary and as temporary adjunctive treatment.

DMARDs in EA

Of the 1848 screened articles, 353 were fully reviewed and 11 prognostic studies with prospective follow-up were considered suitable to examine the window of opportunity concept. Twenty-five RCTs were relevant for efficacy and safety and 48 prognostic studies with prospective follow-up met the inclusion criteria concerning the prediction of therapeutic response.

Nine studies with prospective follow-up, assessing the impact of early treatment on long-term outcomes, were found. Eight of them were compatible with a window of opportunity theory: they all suggested a better prognosis with an early rather than delayed treatment start.

The most frequently studied cut-off duration for treatment start was 3 months. Studies comparing functional and radiographic outcomes between patients with early versus late DMARD start are summarised in table 3.

The symptom duration with optimal likelihood to achieve drug-free remission was between 11.4 and 19.1 weeks, depending on the population studied. We did not find any new trial comparing combinations of csDMARDs or tsDMARDs to MTX monotherapy in patients with EA or early RA. The CareRA trial and the COBRA-light study compared MTX monotherapy with csDMARD combination therapy, but the doses of GCs in the combination csDMARD arm and in the monotherapy arm were markedly different, making a direct comparison of the outcomes difficult.
### Table 3: Window of opportunity: impact of early treatment start on functional and radiographic outcomes

<table>
<thead>
<tr>
<th>Reference</th>
<th>Data source</th>
<th>Population</th>
<th>n</th>
<th>DMARD start End point</th>
<th>Functional outcomes</th>
<th>Radiographic outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bosello et al (2b)</td>
<td>Consecutive patients attending early arthritis clinic</td>
<td>RA with duration &lt;12 months</td>
<td>44</td>
<td>&lt;3 months</td>
<td>Presence of at least one erosion at 12 months</td>
<td>27.1%</td>
</tr>
<tr>
<td>Gremese et al (2b)</td>
<td>Consecutive patients attending 3 early arthritis clinics</td>
<td>RA with duration &lt;12 months</td>
<td>77</td>
<td>≥3 months</td>
<td>12-month HAQ &lt;0.5</td>
<td>62.7%</td>
</tr>
<tr>
<td>Lukas et al (2b)</td>
<td>ESPOIR</td>
<td>Arthritis with duration &lt;6 months</td>
<td>376</td>
<td>≥3 months</td>
<td>12-month mean radiographic progression</td>
<td>41.3%</td>
</tr>
<tr>
<td>Weng et al (2b)</td>
<td>Western Consortium of Practicing rheumatologist study</td>
<td>RF+RA within 16 months from symptoms onset to DMARD initiation</td>
<td>521</td>
<td>≥3 months</td>
<td>2-year changes in HAQ and mTSS progression</td>
<td>0.8 units/year * †</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>42</td>
<td>&lt;3 months</td>
<td></td>
<td>1.7 units/year</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>≥10 months</td>
<td></td>
<td>1.77±2.75 units/year</td>
</tr>
</tbody>
</table>

*Comparison early versus late DMARD start: p<0.05
†Propensity analysis. Data are expressed in means±SD or in percentage.

DMARD, disease-modifying antirheumatic drug; ESPOIR, Elevation et Suivi de POlyarthrites Indifférenciées Récentes; HAQ, Health Assessment Questionnaire; LoE, level of evidence; mTSS, modified total Sharp score; RA, rheumatoid arthritis.
<table>
<thead>
<tr>
<th>Study (LoE)</th>
<th>Trial</th>
<th>Systematic bDMARD withdrawal from</th>
<th>Population (DMARD naïve)</th>
<th>Initial therapy</th>
<th>Clinical outcome after step-down</th>
<th>Radiographic outcome after step-down</th>
<th>Risk of bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detert et al (1b)</td>
<td>HIT HARD</td>
<td>Yes</td>
<td>Week 24</td>
<td>Pts with ERA n=87 n=85</td>
<td>ADA+MTX</td>
<td>DAS28 remission at week-48 42%</td>
<td>Week-48 mTSS 2.6</td>
</tr>
<tr>
<td>Atsumi et al (1b)</td>
<td>C-OPERA</td>
<td>Yes</td>
<td>Week 52</td>
<td>Pts with high risk† ERA n=108 n=71</td>
<td>MTX+PBO</td>
<td>SDAI remission at week 104 41%</td>
<td>Percentage of patients with year 2 ΔmTSS ≥0.5 16%</td>
</tr>
<tr>
<td>Hørslev-Petersen et al (2b)</td>
<td>OPERA</td>
<td>LDA only</td>
<td>Week 54</td>
<td>Pts with ERA n=89 n=91</td>
<td>ADA+MTX</td>
<td>DAS28CRP &lt;2.6 at 24 months 69%</td>
<td>Per centage of pts with year 2 ΔmTSS ≥1 84%</td>
</tr>
<tr>
<td>Smolen et al (2b)</td>
<td>OPTIMA</td>
<td>LDA only</td>
<td>Week 26</td>
<td>Pts with ERA n=102 n=112</td>
<td>ADA+MTX</td>
<td>DAS28CRP &lt;2.6 at 78 weeks 66%</td>
<td>Percentage of pts with week78 ΔmTSS ≥0.5 81%</td>
</tr>
<tr>
<td>Emery et al (2b)</td>
<td>AVERT</td>
<td>LDA only</td>
<td>Week 54</td>
<td>Pts with ACPA +ERA n=119 n=116</td>
<td>ABA+MTX</td>
<td>DAS28-CP &lt;2.6 at 18 months 18%</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Week 54</td>
<td>n=116</td>
<td>ABA+PBO</td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NA</td>
<td>n=116</td>
<td>MTX+PBO</td>
<td>9%*</td>
<td></td>
</tr>
</tbody>
</table>

p Value for comparison bDMARD+MTX versus MTX *<0.05; **<0.01; ***<0.001.
†High-risk ERA defined as high titres of ACPA/RF or erosions.
‡Abstract only.
ACPA, anticitrullinated protein antibody; ADA, adalimumab; CZP, certolizumab-pegol; DB, double-blind; ERA, early rheumatoid arthritis; LDA, low disease activity; LoE, level of evidence; MTX, methotrexate; NA, not applicable; pts, patients; RF, rheumatoid factor; SJC, swollen joint count; SSZ, sulfasalazine; ΔmTSS, variations in modified total Sharp score.
<table>
<thead>
<tr>
<th>Study (LoE)</th>
<th>Trial</th>
<th>n</th>
<th>Initial arms</th>
<th>Type of intensification</th>
<th>Step-up from</th>
<th>Twelve-month remission</th>
<th>Radiographic outcome after step-down</th>
<th>Risk of bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nam J et al (1b)</td>
<td>IDEA</td>
<td>55</td>
<td>IFX+MTX</td>
<td>IFX dose increase csDMARD combination</td>
<td>Week 26</td>
<td>DAS44 &lt;1.6</td>
<td>48%</td>
<td>ΔmTSS at week 50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>57</td>
<td>MTX+MP+PBO</td>
<td>MTX dose increase, then ETN.</td>
<td>Week 26</td>
<td>DAS44 &lt;1.6</td>
<td>47%</td>
<td>ΔmTSS at week 52</td>
</tr>
<tr>
<td>Ter Wee et al (1b)</td>
<td>COBRA-light</td>
<td>81</td>
<td>MTX+SSZ+GC</td>
<td>ETN</td>
<td>Week 26</td>
<td>DAS44 &lt;1.6</td>
<td>38%</td>
<td>ΔmTSS at week 52</td>
</tr>
<tr>
<td>Axelsen et al (1b)</td>
<td>OPERA</td>
<td>89</td>
<td>ADA+MTX</td>
<td>csDMARD combination or bDMARD</td>
<td>Week 12</td>
<td>DAS28CRP &lt;2.6</td>
<td>74%</td>
<td>mTSS at week 52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>91</td>
<td>PBO+MTX</td>
<td>csDMARD combination, then ADA MTX+ETN, then MTX+ADA</td>
<td>Week 12</td>
<td>DAS &lt;1.6</td>
<td>61%</td>
<td>ΔmTSS at week 52</td>
</tr>
<tr>
<td>De Jong et al (1b)</td>
<td>tREACH</td>
<td>91</td>
<td>csDMARD combination +Intramuscular-GC</td>
<td>MTX+ETN, then MTX+ADA</td>
<td>Week 12</td>
<td>DAS &lt;1.6</td>
<td>51%</td>
<td>ΔmTSS at week 52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>93</td>
<td>csDMARD combination +oral GC</td>
<td>MTX+ETN, then MTX+ADA</td>
<td>Week 12</td>
<td>DAS &lt;1.6</td>
<td>54%</td>
<td>ΔmTSS at week 52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>97</td>
<td>MTX+ oral GC</td>
<td>MTX+ETN, then MTX+ADA</td>
<td>Week 12</td>
<td>DAS &lt;1.6</td>
<td>54%</td>
<td>ΔmTSS at week 52</td>
</tr>
<tr>
<td>Atsumi et al (2c)</td>
<td>C-OPERA</td>
<td>159</td>
<td>CZP+MTX</td>
<td>open label CZP+MTX</td>
<td>Week 24</td>
<td>DAS28 &lt;2.6</td>
<td>57%</td>
<td>ΔmTSS at week 52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>157</td>
<td>PBO+MTX</td>
<td>CZP+MTX</td>
<td>Week 24</td>
<td>DAS28 &lt;2.6</td>
<td>37%***</td>
<td>ΔmTSS at week 52</td>
</tr>
<tr>
<td>Bijlsma et al (1b)</td>
<td>U-ACT-EARLY STRATEGY STUDY</td>
<td>106</td>
<td>TCZ+MTX</td>
<td>TCZ+MTX+HCQ, then TNFi+MTX</td>
<td>Week 24</td>
<td>DAS28 &lt;2.6 with SJC ≤4, for ≥24 weeks$</td>
<td>86%</td>
<td>ΔmTSS at week 52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>103</td>
<td>TCZ+PBO</td>
<td>TCZ+HCQ, then TCZ+MTX</td>
<td>Week 24</td>
<td>DAS28 &lt;2.6 with SJC ≤4, for ≥24 weeks$</td>
<td>88%</td>
<td>ΔmTSS at week 52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>108</td>
<td>MTX+PBO</td>
<td>MTX+HCQ, then MTX+TCZ</td>
<td>Week 24</td>
<td>DAS28 &lt;2.6 with SJC ≤4, for ≥24 weeks$</td>
<td>77%</td>
<td>ΔmTSS at week 52</td>
</tr>
</tbody>
</table>

Results are expressed in %; means±SD or medians (IQR). Comparison of ab initio versus delayed intensive therapy *p<0.05; ***p<0.001.
†Open label trial.
‡Single-blinded trial.
ADA, adalimumab; bDMARD, biological DMARD; csDMARD, conventional synthetic disease modifying antirheumatic drug; DAS, Disease Activity Score; ETN, etanercept; HCQ, hydroxychloroquine; IFX, infliximab; LoE, level of evidence; MP, methylprednisolone; MTX, methotrexate; mTSS, variation of modified total Sharp score; TCZ, tocilizumab; TNFi, tumour necrosis factor inhibitors.
therapy than in those on MTX monotherapy (n=60/93 vs n=44/97; p=0.008).

Among the 10 studies comparing bDMARDs and csDMARDs in early RA, the rate of infections was numerically higher with bDMARDs in 2 studies (1.2 to 2.9-fold) and the withdrawal for safety numerically higher with bDMARDs in 4 studies (1.2 to 2.0-fold).

The results of these RCTs are in accordance with the previously formulated standpoint that among the DMARDs, MTX is considered the anchor drug, and should be used first in patients at risk of developing persistent disease.

Predictors of primary failure, predictors of therapeutic response and predictors of remission achievement in patients treated with a first-line csDMARD

Many clinical and biological biomarkers have reportedly been associated with primary failure, and considered as predictors of therapeutic response, or predictors of remission in patients treated with a first-line csDMARD. These are listed in online supplementary table S3. While three studies reported statistically significant associations between body mass index (BMI) and remission, predictive values of a high BMI at baseline were either not between body mass index (BMI) and remission, studies reported statistically significant associations between body mass index (BMI) and remission, predictive values of a high BMI at baseline were either not available or lower than 40% (see online supplementary table S4). Current smoking was associated with lower response to a first-line DMARD in four studies, with positive predictive value ranging from 38% to 71% (see online supplementary table S4). Otherwise, published associations between therapeutic response and other biomarkers have not been replicated yet.

Disease monitoring

Of the 1872 records screened, only 1 met the inclusion criteria. The TICORA study conducted in early psoriatic arthritis randomised patients to receive either tight control (monthly review with escalation of therapy if the target was not achieved) or standard care (3 monthly review). The proportion of patients achieving an ACR20 response at 48 weeks (primary outcome) was higher in the tight control arm compared to the standard care arm (55/89 vs 37/84; OR 1.9 (1.0 to 3.5); p=0.04).

The results of this RCT are in accordance with the previously formulated standpoint that in EA, disease activity should be assessed at 1–3-month intervals for as long as remission is not achieved.

DISCUSSION

This SLR was performed to inform the EULAR task force involved in the update of the recommendations for the management of EA. Overall, this SLR reinforces the data provided by the SLRs performed in 2005 and 2013 on pharmacological and non-pharmacological interventions.

With regard to pharmacological interventions, exercise programmes may improve pain and function. With regard to pharmacological interventions, GCs may help improve clinical and radiographic outcomes but raise concerns about long-term safety, especially on cardiovascular outcomes.

Recent studies have convincingly demonstrated the need for an early start of DMARDs, which gives a better long-term outcome with a ‘window of opportunity’ estimated at ~3 months after the start of symptoms.

Recent data for DMARDs did not show convincing evidence for a benefit of csDMARDs combination over MTX monotherapy. bDMARDs, usually combined with csDMARDs, are more efficacious than MTX monotherapy in early RA, but also have more side effects and are far more expensive. Reports on the efficacy of tsDMARDs in EA are limited and long-term safety from real-life observational studies is still lacking. A delayed start of bDMARDs in combination with MTX (only in those patients who need it) does not seem to be associated with worse long-term outcomes than bDMARDs ‘ab initio’ as long as a rigorous treat-to-target strategy is pursued, and is far cheaper. Short-term superiority of treatment with bDMARDs was not maintained on withdrawal of the bDMARD. Thus, escalating csDMARD therapy and adding a bDMARD in cases of non-response seems to be a rational approach.

Biomarkers that can predict a failure to first-line therapy with MTX would be useful to propose intensive therapy ‘ab initio’ in selected cases. However, such a biomarker is currently not available. Further research is warranted.

Prospective longitudinal studies evaluating the impact of smoking cessation on the outcome of EA as well as the efficacy of psychological interventions and strategies to promote DMARD adherence are currently lacking and should be added to the research agenda.

The main limitation of this SLR is the lack of studies including patients with early undifferentiated arthritis, since most of the literature refers to patients with early RA. Another limitation is that the analysis on DMARD safety in this SLR was limited to safety reported in RCTs. However, a recent SLR conducted by EULAR had a broader focus on safety of DMARD in RA.

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