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Giuliani Stephane, Laurent Benjamin, Marcelo de Carvalho-Bittencourt, Luc Amandine, Baumann Cédric, et al.. Predictive value of immunological and imaging biomarkers on achieving good clinical response at 6 months in rheumatoid arthritis patients treated by intravenous bDMARDs. EULAR European Congress of Rheumatology, Jun 2020, Frankfurt, Germany. hal-02982732

**HAL Id: hal-02982732**

**<https://hal.univ-lorraine.fr/hal-02982732v1>**

Submitted on 28 Oct 2020

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# Predictive value of immunological and imaging biomarkers on achieving good clinical response at 6 months in rheumatoid arthritis patients treated by intravenous bDMARDs

Giuliani Stephane<sup>1</sup>, Laurent Benjamin<sup>1</sup>, De Carvalho-Bittencourt Marcelo<sup>2</sup>, Luc Amandine<sup>3</sup>, Baumann Cédric<sup>3</sup>, Chary-Valckenaere Isabelle<sup>1,4</sup>, Loeuille Damien<sup>1,4</sup>

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**Purpose :** To investigate the value of biological and imaging biomarkers on predicting good clinical response at 6 months, in RA patients initiating intravenous bDMARDs.

## Methods :

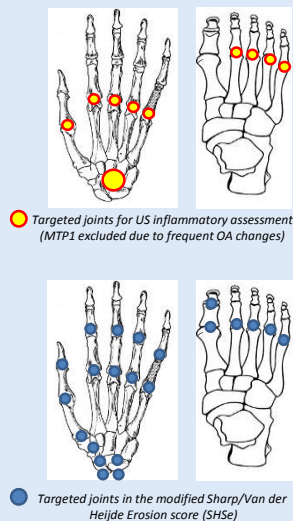
Single-center retrospective study between 2008 and 2017, including 173 patients with active RA according to ACR 1987 and/or ACR-EULAR 2010 criteria, initiating IV bDMARDs.

Clinical, biological and imaging (US and RX) data, were collected at treatment initiation.

**155 patients** entered the analysis after exclusion of those with missing clinical or biological data or when lost to follow-up.

Modified Sharp/van der Heijde erosion score (SHSe ranged from 0 to 280) was calculated for **110 patients** and erosive disease was defined according to EULAR 2013 criteria for erosive RA (erosions in at least 3 separate joints)

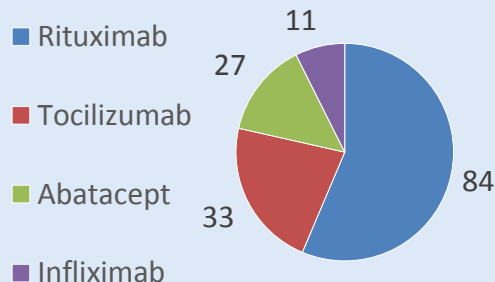
Ultrasound data were collected in baseline reports for number of synovitis and tenosynovitis on greyscale (B-mode) and Power Doppler (PD) modes for **127 patients**.



**Good clinical response was defined by DAS 28 < 3.2 and/or DAS 28 decrease > 1.2 at 6 months.**

## Results :

### Distribution of RA patients by IV bDMARDs



♂ 27.1% ♀ 72.9%

Median Age: 56y (Q1 48–Q3 62)

ACPA + n=132 (85.2%)  
FR + n=114 (74.5%)

**Median disease duration**  
11years and 9months

**Structural damage on Rx**  
Erosive RA: n=84/110 (75.5%)  
Median SHSe: 36.5 (Q1 11.0 - Q3 79.0)

**Good responders at 6 months**  
n=87 out of 155 (56.1%)

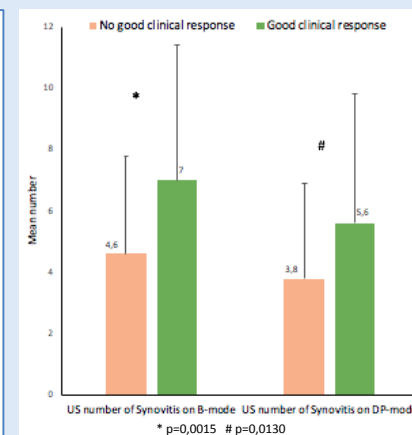
In univariate analysis (n=155 patients), predictive biomarkers of good clinical response at 6 months were:

### Immunology

Positive RF p=0.0145  
Higher RF titers p=0.0002  
Positive ACPA p=0.0389  
Positive RF and ACPA p=0.0130

### Imaging

Higher SHSe p=0.0029  
Higher number of B-mode synovitis p=0.0015  
Higher number of PD+ synovitis p=0.0130



Predictive value of US inflammation at baseline

In multivariate regression (n=101 patients), two biomarkers remain predictive:

**Positive RF status**  
OR=5.1 (CI 95: 1.8 – 14.4)

**Higher number of B-mode synovitis**  
OR=1.2 (CI 95: 1.1 – 1.4)

## Conclusion

- In RA patients initiating IV bDMARDs, **positive RF status** is a strong predictive biomarker of achieving good clinical response after 6 months of treatment.
- Concerning imaging biomarkers, **number of US B-mode synovitis** at baseline is also predictive.
- The analysis has been conducted on the pooled data of bDMARDs, due to the number of patients available. It would be interesting to confirm in further Research if the results differ between IV bDMARDs.

# Predictive value of immunological and imaging biomarkers on achieving DAS28 remission at 6 months in rheumatoid arthritis patients treated by intravenous bDMARDs

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**Purpose :** To investigate the value of biological and imaging biomarkers on predicting DAS28 remission at 6 months, in RA patients initiating intravenous bDMARDs.

## Methods :

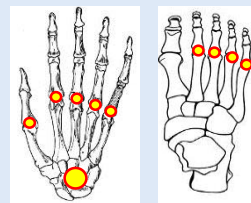
Single-center retrospective study between 2008 and 2017, including 173 patients with active RA according to ACR 1987 and/or ACR-EULAR 2010 criteria, initiating IV bDMARDs.

Clinical, biological and imaging (US and RX) data, were collected at treatment initiation.

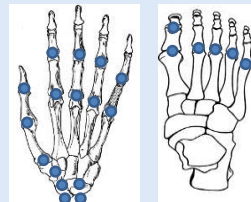
**155 patients** entered the analysis after exclusion of those with missing clinical or biological data or when lost to follow-up.

Modified Sharp/van der Heijde erosion score (SHSe ranged from 0 to 280) was calculated for **110 patients** and erosive disease was defined according to EULAR 2013 criteria for erosive RA (erosions in at least 3 separate joints).

Ultrasound data were collected in baseline reports for number of synovitis and tenosynovitis on greyscale (B-mode) and Power Doppler (PD) modes for **127 patients**.



● Targeted joints for US inflammatory assessment (MTP1 excluded due to frequent OA changes)

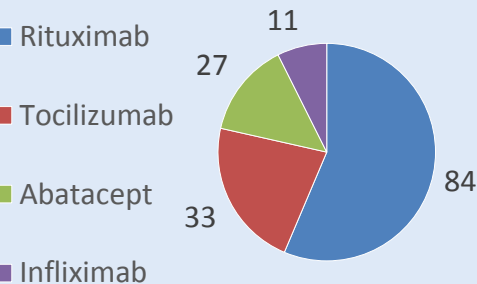


● Targeted joints in the modified sharp/van der Heijde Erosion score (SHSe)

Remission was defined by DAS 28 < 2.6 at 6 months.

## Results :

### Distribution of RA patients by IV bDMARDs



♂ 27.1% ♀ 72.9%

Median Age 56y  
(Q1 48- Q3 62)

ACPA +  
n=132 (85.2%)  
RF +  
n=114 (74.5%)

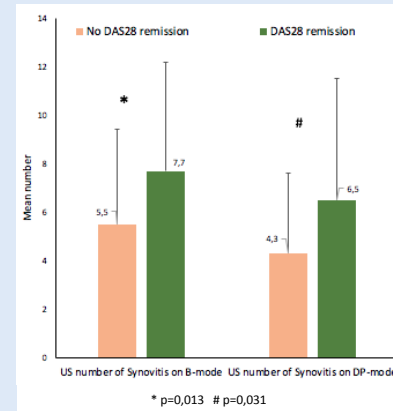
Median disease duration:  
11years and 9months

Structural damage on Rx:  
Erosive RA: n=84/110 (75.5%)  
Median SHSe: 36.5 (Q1 11.0- Q3 79.0)

DAS28 remission at 6 months  
n=33 out of 155 (21.3%)

In univariate analysis (n=155 patients), predictive biomarkers of DAS28 remission at 6 months were:

| Category   | Biomarker                         | p-value |
|------------|-----------------------------------|---------|
| Clinical   | bDMARD naive                      | p=0.052 |
|            | Higher RF titers                  | p=0.073 |
| Immunology | Higher number of B-mode synovitis | p=0.013 |
|            | Higher number of PD+ synovitis    | p=0.031 |



Predictive value of US inflammation at baseline

In multivariate regression (n=103 patients) only one biomarker remain predictive:

**Higher number of PD+ synovitis**  
OR=1.1 (CI 95: 1.0 – 1.3)

## Conclusion

- In RA patients initiating IV bDMARDs, none of clinical or biological biomarkers are efficient to predict DAS28 remission status after 6 months of treatment.
- Concerning imaging biomarkers, number of US PD+ synovitis at baseline is the only predictive biomarker.
- The analysis has been conducted on the pooled data of bDMARDs, due to the number of patients available. It would be interesting to confirm in further Research if the results differ between IV bDMARDs