Left Ventricular Remodeling in post Myocardial Infarction: Effects of colchicine and echocardiographic predictors factors

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I currently have, or have had over the last two years, an affiliation or financial interests or interests of any order with a company or I receive compensation or fees or research grants with a commercial company:

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INTRODUCTION

Left ventricular remodeling:

> In the first hours after AMI
> Major cause of heart failure and mortality
> Modification of size, form and function
> Complex pathogenesis

In post AMI:

Systemic biological Inflammation
  > Peak of CRP around day 3

Correlation with infarct size \(^{(1)}\)

No anti-inflammatory drugs
  > Pleiotropic effect of statins
  > New biotherapies (IL1)

Imaging Methods:

> MRI: EF, Volumes, No Reflow
> TTE: EF, Volumes, Strain

(1) Roubille F, Routinely-feasible multiple biomarkers score to predict prognosis after revascularized STEMI, Eur J Intern Med., 2010
Colchicine:

> Inhibition of neutrophil migration

> Used for centuries:
    Familial Mediterranean Fever; Gouty attacks; Rheumatic complaints

> Cardiology:

    Pericardial diseases...

    Anti-atherosclerotic actions
    Reduce inflammation in patients with stable coronary disease
    Potential interest in the post-infarction remodeling


(2) Nidorf M, Effect of colchicine (0.5 mg twice daily) on high-sensitivity C-reactive protein independent of aspirin and atorvastatin in patients with stable coronary artery disease, Am J Cardiol. 2007

Study COLIN:
Assess the impact of colchicine in post myocardial infarction on Peak of CRP.

Main objective of our sub-study:

> Investigate the impact of colchicine treatment on ventricular remodeling

> Identify its predictive imaging parameters
METHODS

Monocentric Study (CHU Montpellier)

Interventional open-labelled, controlled, prospective study

Between December 2014 and May 2015

All patients with a STEMI

- Coronary occlusion (TIMI 1-0)
- Successfully revascularized with primary angioplasty

Exclusion criteria:

- Presence of cardiogenic shock
- Severe renal impairment (creatinine clearance <30mL/min)
- Intolerance to colchicine
Randomization 1: 1

- Colchicine group and optimal treatment
- Optimal treatment group alone.

Treatment with colchicine:

- First day of the STEMI
- For a period of 1 month
- 1mg dose per day
- Without loading dose

Left ventricular remodeling: increase in LVTDV greater than 20% at 1 month

TTE: First Week + 1 month
RESULTS

Colchicine group: 23 patients

- No MRI: 3 patients
- No TTE: 1 patients

19 patients

- Remodeling: 4 patients

Control group: 21 patients

- No MRI: 5 patients
- No TTE: 2 patients

14 patients

- Remodeling: 8 patients
<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Colchicine (n=23)</th>
<th>Control (n=21)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male, n (%)</td>
<td>19 (82.5)</td>
<td>16 (76.2)</td>
<td>0.9</td>
</tr>
<tr>
<td>Age (y), mean ± SD</td>
<td>60.1 ± 13.1</td>
<td>59.7 ± 11.4</td>
<td>1</td>
</tr>
<tr>
<td>Hypertension, n (%)</td>
<td>9 (39.1)</td>
<td>10 (47.6)</td>
<td>0.5</td>
</tr>
<tr>
<td>Diabetes mellitus, n (%)</td>
<td>3 (13.0)</td>
<td>3 (14.3)</td>
<td>1</td>
</tr>
<tr>
<td>Smoker, n (%)</td>
<td>17 (73.9)</td>
<td>14 (66.7)</td>
<td>0.7</td>
</tr>
<tr>
<td>Dyslipidemia, n (%)</td>
<td>8 (34.8)</td>
<td>8 (38.1)</td>
<td>1</td>
</tr>
<tr>
<td>Previous CABG, n (%)</td>
<td>0 (0)</td>
<td>1 (4.8)</td>
<td>0.5</td>
</tr>
<tr>
<td>Previous PCI, n (%)</td>
<td>1 (4.3)</td>
<td>1 (4.8)</td>
<td>1</td>
</tr>
<tr>
<td>Chronic kidney failure, n(%)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>1</td>
</tr>
<tr>
<td>Antiplatelet therapy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Clopidogrel, n (%)</td>
<td>7 (30.5)</td>
<td>9 (42.9)</td>
<td>0.12</td>
</tr>
<tr>
<td>- Prasugrel, n (%)</td>
<td>15 (65.2)</td>
<td>8 (38.1)</td>
<td></td>
</tr>
<tr>
<td>- Ticagrelor, n (%)</td>
<td>1 (4.3)</td>
<td>4 (19.0)</td>
<td></td>
</tr>
<tr>
<td>Culprit artery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- LAD, n (%)</td>
<td>14 (60.9)</td>
<td>7 (33.3)</td>
<td>0.07</td>
</tr>
<tr>
<td>- Circumflex, n (%)</td>
<td>3 (13.0)</td>
<td>2 (9.6)</td>
<td></td>
</tr>
<tr>
<td>- RCA, n (%)</td>
<td>6 (26.1)</td>
<td>12 (57.1)</td>
<td></td>
</tr>
<tr>
<td>Creatinine (µmol/L), mean ± SD</td>
<td>86.7 ± 20.2</td>
<td>79 ± 17.4</td>
<td>0.2</td>
</tr>
<tr>
<td>Troponin (ng/L) mean ± SD</td>
<td>1408.2 ± 3187.5</td>
<td>2071.3 ±3329.4</td>
<td>0.06</td>
</tr>
</tbody>
</table>
Colchicine and Remodeling

> 4 patients in colchicine group
> 8 patients in control group

Percentage of variation in LVEDV:

> Colchicine group:
  6.8% (95% CI -3.1 - 16.6 ; p 0.3)

> Control group:
  28.9% (95% CI 9.3 - 48.5 ; p 0.4)
Remodeling and TTE parameters

**LVEDV**
Baseline: coefficient -0.43; p <0.05
At 1 month: coefficient 0.43; p <0.05

**LVEF**
Baseline: coefficient -0.33; p 0.06
At 1 month: coefficient -0.40; p <0.05

**LV GLS**
Baseline: coefficient 0.24; Not significant
At 1 month: Coefficient 0.34; p 0.05

**No correlation:**
No Reflow / Remodeling
No Reflow / LV or RV parameters
DISCUSSION

Study COLIN:
> No reduction of CRP peak or Infarct size

Colchicine and Remodeling:
> Less Remodeling
> Not significant

Imaging and Remodeling:
LVEF / LVEDV / LV GLS => Correlation with Remodeling Strain
> STEMI: Infarct Size (1) / Remodeling (2)
> NSTEMI (3)

LIMITATIONS
> Low sample of patients
> Loss of data
> Low follow-up time
> Not well balanced population:
  > Higher rate of LAD involved in colchicine group
  > More transmural infarctions in the colchicine group (69.6% vs 42.9% ; p=0.04)

(1) Sjøli B, Comparison of Left Ventricular Ejection Fraction and Left Ventricular Global Strain as Determinants of Infarct Size in Patients with Acute Myocardial Infarction, J Am Soc Echocardiogr, 2009
(2) Jang JY, Serial Assessment of Left Ventricular Remodeling by Measurement of Left Ventricular Torsion Using Speckle Tracking Echocardiography in Patients With Acute Myocardial Infarction, Am J Cardiol, 2010
(3) D’Andrea A, Global longitudinal speckle-tracking strain is predictive of left ventricular remodeling after coronary angioplasty in patients with recent non-st elevation myocardial infarction, Int J Cardiol, 2011
CONCLUSION

Colchicine

> Interesting therapeutic to limit the left ventricular remodeling in post infarction

LVEF, volumes (EDV) and strain VG

> Predictive markers of left ventricular remodeling in post myocardial infarction

> No superiority of one parameter against another