Use of a novel high-sensitivity troponin T, I and MPO, NT-proBNP assays to detect myocardial injury in patients with atrial fibrillation treated by direct-current cardioversion

C. Le Goff[1] , C.Garweg[2], J-F. Kaux[3], P.Melon[2], P. Lancellotti[2], L. Pierard[2], J-P.Chapelle[1]

[1] Department of Clinical Chemistry of the University of Liege, Liège, Belgium
[2] Department of Cardiology, CHU Sart-Tilman, Liège, Belgium
[3] Department of Motricity Sciences of the University of Liege and CHU Sart-Tilman, Liège, Belgium

Introduction:

Novel high-sensitive cardiac troponin T (hsTnT) and I (TnI II) assays have the potential to detect myocardial injury with a higher sensitivity. The aim of the study was to assess the level of hsTnT and TnI II in patients with atrial fibrillation (AF) as compared to control and following direct current cardioversion. Levels of NT-proBNP, myeloperoxydase (MPO) and hs-CRP were concomitantly measured.

Methods:

HsTnT, NT-proBNP, hs-CRP and TnI II determinations were realized on heparin plasma of 27 patients with AF successfully treated by cardioversion and 64 control subjects.
MPO quantification was performed on the EDTA plasma samples. All assays were performed before (T0) and 4 hours (T+4h) after cardioversion.

Results:

The levels of hsTnT (Fig.1) and TnI II (Fig.2) were increased in patients with AF compared to controls ($p<0.005$). Between T0 and T+4h, we observed an increased of TnI II ($p=0.36$) (Fig. 5) but not for hsTnT ($p=0.5$) (Fig. 6). Cardioversion was not associated with any statistically change in hsTnT and TnII levels. AF patients also had higher NT-proBNP level (Fig. 3) than controls ($p<0.001$) and increased level of hs-CRP ($p=0.08$) (Fig. 4). NT-proBNP levels decreased between T0 and T+4h (Fig.7). For hsCRP, no change was observed between T0 and T+4h (Fig.8). MPO levels were not increased between T0 and T+4h (Fig. 9).

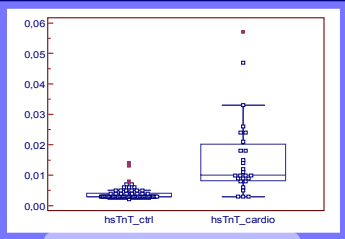

Fig. 1 : hs TnT (µg/L) - Comparison controls with AF patients

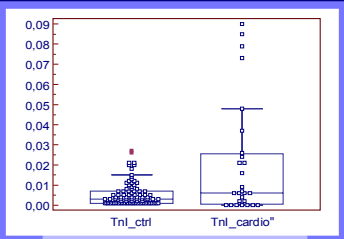

Fig. 2 : TnI (µg/L) - Comparison controls with AF patients

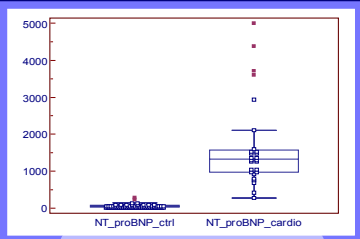

Fig. 3: NT-proBNP (ng/L) - Comparison controls with AF patients

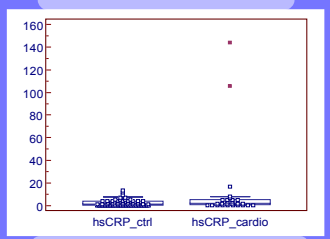

Fig. 4 : hs CRP (mg/L) - Comparison controls with AF patients

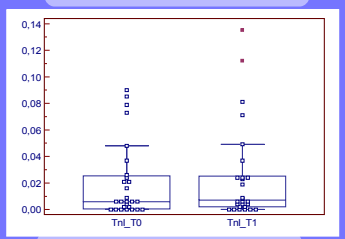

Fig. 5 : TnI (µg/L) - Comparison between T0 and T+4h in AF patients

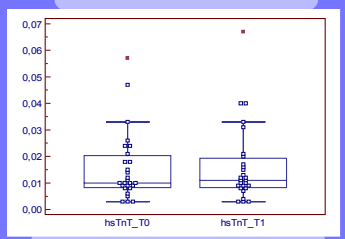

Fig. 6 : hs TnT (µg/L) - Comparison between T0 and T+4h in AF patients

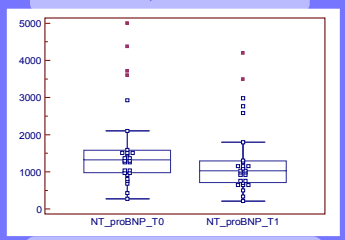

Fig. 7 : NT-proBNP (ng/L) - Comparison between T0 and T+4h in AF patients

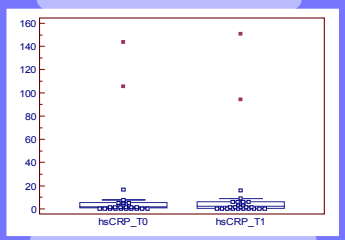

Fig.8 : hsCRP (ng/.mL) - Comparison between T0 and T+4h in AF patients

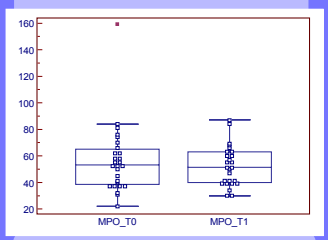

Fig.9 : MPO (ng/.mL) - Comparison between T0 and T+4h in AF patients

Conclusions:

Our results showed that patients with persistent AF had increased plasmatic concentration of hsTnT and TnI II reflecting the presence of myocardial damage that was not further modified by cardioversion. In our population, AF was associated with increased level of NT-proBNP and sign of inflammation as reflected by elevated hs-CRP plasmatic concentration. MPO assays cannot be used in this case.