RELATIONSHIPS BETWEEN FIBROSIS OF EXTRACELLUALR MATRIX AND CARDIAC MORPHOLOGY AND FUNCTION IN DILATED CARDIOMYOPATHY

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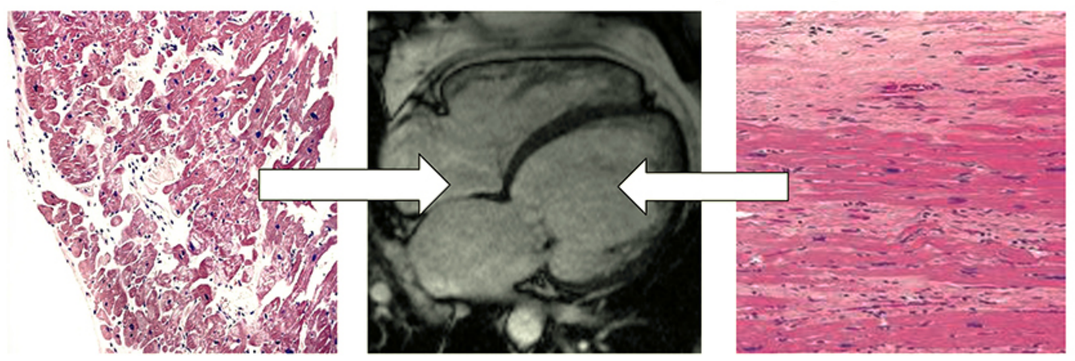
Background

One of the main feature of dilated cardiomyopathy (DCM) is fibrosis of extracellular matrix (ECM). However, the impact of fibrosis on morphology and function of the heart as well as on the outcome are still poorly understood.

Aim

To study relation between ECM fibrosis and cardiac morphology and function in DCM.



Methods

Since July 2014 till May 2015 we included 63 consecutive DCM patients. All patients underwent comprehensive, step-by-step diagnostic work-up that included ECG, echocardiogram, Holter monitoring, cardiopulmonary exercise test, laboratory studies as well as invasive studies, such as coronary angiography, right heart catherization and endomyocardial biopsy (EMB). EMB of the right ventricular septum was performed via femoral or jugular vein under fluoroscopic guidance. Light microscopic assessment of histopathology in picrosirius red stained biopsy samples was performed by the experienced pathologist blinded to the clinical results.

Results

Fibrosis was detected in 23 (36.5%) patients

without fibrosis (group 1, n=40) | **with fibrosis (group 2, n=23)**

Fibrosis significantly correlated only with the duration of DCM (r=0.32; p=0.01) and PCWP (r=0.35; p=0.009) but borderline correlations were observed for fibrosis and LVEDvol, ejection fraction, and mean PAP (r=-0.29, p=0.06; r=0.23, p=0.07, r=-025, p=0.06, respectively).

Parameter	Group 1 (n=28)	Group 2 (n=35)	p-value
Age [years]	47.3 ± 12.6	47.5 ± 12.2	0.94
Male/female [n/%]	25 (89%)/ 3 (11%)	31 (89%)/ 4 (11%)	0.93
Duration of disease [months]	2.4 ± 1.4	48.3 ± 39.1	< 0.001
Ejection fraction [%]	23.9 ± 6.8	25.3 ± 8.4	0.47
NT-proBNP [pg/ml]	3323 ± 5404	5645 ± 13550	0.4
ECM fibrosis	6 (21.4%)	17 (48.6%)	0.02
Myocyte hypertophy	26 (93%)	34 (97%)	0.5

Parameter	Group 1 (n=40)	Group 2 (n=23)	p-value
Age [years]	48.5 ± 12.8	45.5 ± 11.4	0.35
Male/female [n/%]	35(87.5%)/5(12.5%)	21 (91%)/2 (9%)	0.64
Duration of disease [months]	20.8 ± 33.1	40.3 ± 40.9	< 0.05
LVEDd [mm]	68.2 ± 15.8	65.5 ± 11.1	0.5
LVEDvol [ml]	268.9 ± 118	207.4 ± 96	0.08
LV mass [g]	392 ± 129	355 ± 145	0.4
Ejection fraction [%]	23.4 ± 6.9	26.9 ± 8.7	0.07
VO_2peak [ml/kg/min]	16.4 ± 5.7	18.4 ± 5.6	0.2
PAP mean [mmHg]	25.1 ± 11.5	19.6 ± 10.5	0.09
PCWP mean [mmHg]	17.4 ± 8.5	11.5 ± 7.6	0.01
NT-proBNP [pg/ml]	4134 ± 6803	5374 ± 15459	0.67

Conclusions

- More than one-third of DCM patients have fibrosis of extracellular matrix.
- Almost half with late presentation of DCM have fibrosis whereas only one in five early DCM patients have fibrosis.
- Duration of disease seems to be a key factor in the development of ECM fibrosis.
- Counterintuitively, there was a trend towards less advanced cardiac remodeling, better systolic function and better exercise capacity in fibrosis positive patients.
- This observation cannot be clearly explained and warrants further studies

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