ARE THERE SPECIFIC MPI STUDY PARAMETERS THAT CAN DISTINCT ISCHEMIC FROM NONISCHEMIC CARDIOMYOPATHY

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ARE THERE SPECIFIC MPI STUDY PARAMETERS THAT CAN DISTINCT ISCHEMIC FROM NONISCHEMIC CARDIOMYOPATHY

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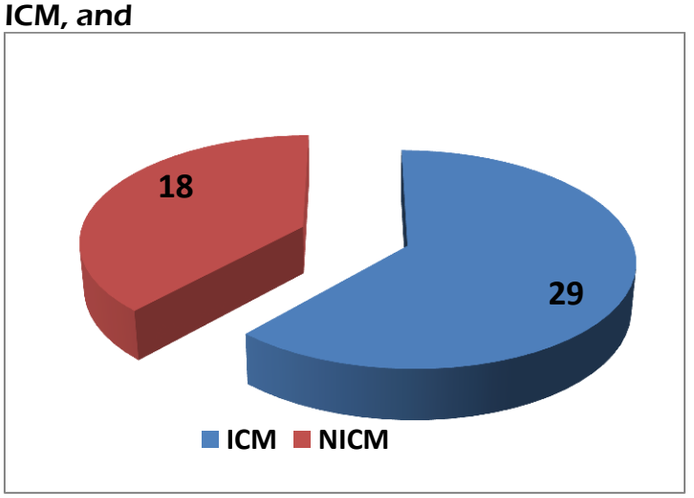
AIM OF THE STUDY

Many times MPI SPECT study proceeds to selective angiocardiography (CA) in patients with dilated cardiomyopathy without evidences of ischemic heart disease. But often, we faces pathological findings that results with normal CA results.

The aim of our study was by retrospective analysis to identify MPI SPECT variables that can make distinction between ischemic and nonischemic dilated cardiomyopathy (ICM/NICM).

MATERIAL AND METHODS

We retrospectively analyzed 47 records of patients with dilated cardiomyopathy who underwent coronary arteriography 6 month prior or after MPI SPECT study. We divided them in two groups according to the CA results: **Group 1** was patients with confirmed ICM, and



Group 2 (patients without significant disease of major coronary arteries on CA) with NICM.

We analyzed demographic *data* (age, gender), *patient history* for presence of major risk factors, functional status (CCSC and NYHA of the patient, prior MI, PCI or CABG, comorbidities, LBBB), *CA data* and *MPI SPECT data.*

From MPI SPECT study we analyzed: type of stress (exercise/dypiridamol), hemodynamic, electrocardiographic and functional response to stress, MPI perfusion parameters, and left ventricular function parameters: LVEF at rest and after stress, LV volumes at rest and after stress, L/H ratio, TID, PF and PE rate at rest and after stress, type of perfusion defect (fix, reversible) extent and location of the defect.

Statistical analysis was done with descriptive and comparative methods, parametric and nonparametric tests for continuous and categorical variables, and uni and multivariate linear logistic regression analyses by using SPSS statistical softwere. We defined significance at the level of 0, 05.

RESULTS

We analyzed 47 patients of which 29 with ICM and 18 with NICM. Significant differences of patient's characteristics between the two groups were found only for CCSC class and presence of previous MI, PCI or CABG in favor of patients with ICMP. As opposite pts. with NICMP were in 44% of cases with LBBB. (Table 1)

Table 1. Comparative characteristics of pts. with ICM vs. NICM

	ICM (N=29)	NICM(N=18)				
variable	Frequencies mean±SD	Frequencies mean±SD	sig	beta	OR	Sig OR
Age	53.76±9.26	53.61±8.64	ns	-0.008	-0.054	ns
BMI	27.49±4.00	27.84±5.76	ns	0.037	0.247	ns
BSA	1.96±0.17	1.96±0.25	ns	0.008	0.054	ns
Gender (female)	3/29	1/18	ns	0.083	1.962	ns
CCSC class	0.97±0.62	0.22±0.42	0.000	-0.551	-4.429	0.000
NYHA class	1.45±0.50	1.50±0.61	ns	0.047	0.313	ns
Prior MI	2/27	0/18	0.000	-0.915	-15.253	0.000
Prior CABG	10/29	0/18	0.004	-0.410	-3.012	0.004
Prior PCI	16/29	0/18	0.000	-0.487	-3.742	0.001
Hypertension	15/29	7/18	ns	-0.125	-0.845	ns
Diabetes	9/29	5/18	ns	-0.350	-0.232	ns
LBBB	2/29	8/18	0.004	0.446	3.343	0.002

Legend: BMI-body mass index, BSI-body surface area, CCSC-Canadian Cardiovascular Society Classification, NYHA New York Heart Association classification, MI-myocardial infarction, PCI-percutany coronary intervention, CABG-coronary artery bypass surgery, LBBB left bundle block

Patients with ICM were more likely to develop ST-segment depression during dypiridamol stress and ischemic chest pain, and had higher OR for presence of reversible and fixed perfusion defects. (Table 2)

Table 2. Comparative characteristics of pts. with ICM vs. NICM gathered from MPI SPECT study (ordinal logistic regression analysis)

	ICM (N=29)	NICM (N=18)

Variable	Frequencies /mean±SD	Frequencies /mean±SD	sig	Chi square	OR	OR sig (Mantel-Haenszel)
ST denivelation	18/29	1/18	0.000	17.202	9.176	0.002
AT during DIP						
0 unchanged	8/29	3/18			0.604	
1hypertensive res.	6/29	8/18	ns	3.023	2.148	ns
2hypotensive res.	15/29	7/18			0.751	
Side effects						
Asymptomatic	16/29	13/18			1.309	
Chest pain	7/29	0/18	0.016	10.300	0.230	0.016
Nonspecific	4/29	5/18			2.014	
Hypotension (treat.)	2/29	0/18			0.805	
Fixed defect	26/29	7/18	0.000	13.903	0.433	0.001
Reversible defect	12/29	0/18	0.001	14.066	0.134	0.000
Patchy distribution	0/29	8/10	0.000	23.924	23.252	0.005

L/H ration was the only LV functional parameter that significantly differs between groups with more frequent pathological values in patients with ischemic MP (Table 3)

Table 3. Comparative characteristics of pts. with ICM vs. NICM (linear regression analysis)

	ICM (N=29)	NICM(N=18)				
Variable	**Frequencies mean±SD**	**Frequencies mean±SD**	**sig**	**beta**	**OR**	**Sig OR**
EFstress (%)	34.55±7.23	34.17±9.25	ns	0.093	0.631	ns
EDVstress (ml)	220.14±63.74	233.83±84.68	ns	0.094	0.631	ns
ESVstress (ml)	144.38±58.96	156.44±72.58	ns	0.093	0.624	ns
EFrest (%)	37.00±8.07	37.06±10.16	ns	0.003	0.020	ns
EDVrest (ml)	216.34±62.48	220.28±86.91	ns	0.027	0.180	ns
ESVrest (ml)	141.66±59.82	144.28±76.07	ns	0.020	0.432	ns
L/H ratio stress	0.43±0.04	0.35±0.03	0.001	-0.746	-4.346	0.001
L/H ratio rest	0.44±0.03	0.35±0.02	0.000	-0.833	-5.837	0.000
PFR stress	1.64±0.54	1.81±0.89	ns	0.122	0.602	ns
PER stress	1.97±0.56	2.25±0.73	ns	0.219	1.100	ns
PFR rest	1.81±0.60	1.94±1.10	ns	-0.169	-0.842	ns
PER rest	2.15±0.62	2.42±0,84	ns	0.196	0.982	ns
TID increased y/n	10/29	11/18	0.069		2.981	0.078

Significant **positive correlations** with NICM were found for *LBBB*, and *patchy distribution* r=0.446, p=0.002, r=0.660, p=0.000 respectively, while **negative correlations** were found for *ST denivelation during stress* (r=-0.560, p=0.000), fixed (r=-0.540, p=0.000), and *reversible perfusion defect* (r=-0.461, p=0.001), and L/H ratio (stress r=-0.805, p=0.000, and rest r=-0.858, p=0.000) all with significance at the level of 0.001.

Correlations

	CCSC	PCI	CABG	IM	LBBB	STdeniv.	Fixed def.	Rever.def.	Patchy distrib.	L/Hs	L/Hr
Correlation Coefficient	-.567**	-.487**	-.410**	-.915**	.446**	-.560**	-.540**	-.461**	.660**	-.805**	-.858**
Sig. (2-tailed)	.000	.001	.004	.000	.002	.000	.000	.001	.000	.000	.000

Multivariate analyze with logistic regression with six variables included: presence of LBBB, adverse reactions, ST denivelation, presence of fixed and reversible perfusion defect and patchy distribution, with stepwise process we got model with R square 0.700, sig of the model 0.000, where five variables were identified as independent predictors: presence of patchy distribution as positive

predictor and ST denivelation, extensive fixed defect and presence of reversible defect, and L/H ratio as negative predictors of NICM.

Model	Standardized coefficients		Sig.	95.0% Confidence Interval for B		Correlations		
	Beta	t		Lower Bound	Upper Bound	Zero-order	Partial	Part
(Constant)		6.223	.000	.506	.991			
Patchy distrib	**.245**	**1.966**	**.056**	-.008	.589	.660	.290	.166
STdenivelation	**-.392**	**-4.341**	**.000**	-.569	-.208	-.560	-.557	-.367
Ischemia y/n	**-.406**	**-4.226**	**.000**	-.670	-.237	-.461	-.546	-.357
Fixed defect	**-.264**	**-2.227**	**.031**	-.014	.000	-.501	-.325	-.188

Conclusion

Patient with dilated CM which are experiencing no anginal symptoms, no ischemic chest pain and no ST-segment depression during dypiridamol stress and who have LBBB, are more likely to have NICM. They tend to have more often small fixed perfusion defects (especially in the presence of LBBB) in anterior and inferior wall, or s.c. "patchy distribution" of the radiotracer. Increased H/L ratio is typically associated with ischemic dilated CM, and is rare in patients with NICM even in the presence of severely depressed LV systolic function.