

Transthyretin cardiac amyloidosis scintigraphy, experience in a reference cardiology center

Carvajal I.¹; Berrios-Barcenas E.¹; C-Guerra E.²; Barajas-Paulin A.¹; Luna-Alvarez Amezquita A.¹; Canseco-Leon N.¹; Alexanderson-Rosas E.¹

¹Instituto Nacional de Cardiología Ignacio Chavez, Mexico City, Mexico

²National Autonomous University of Mexico, PCEM, Faculty of Medicine, Mexico City, Mexico

Funding Acknowledgements: Type of funding sources: Public hospital(s). Main funding source(s): Instituto Nacional de Cardiología Ignacio Chavez

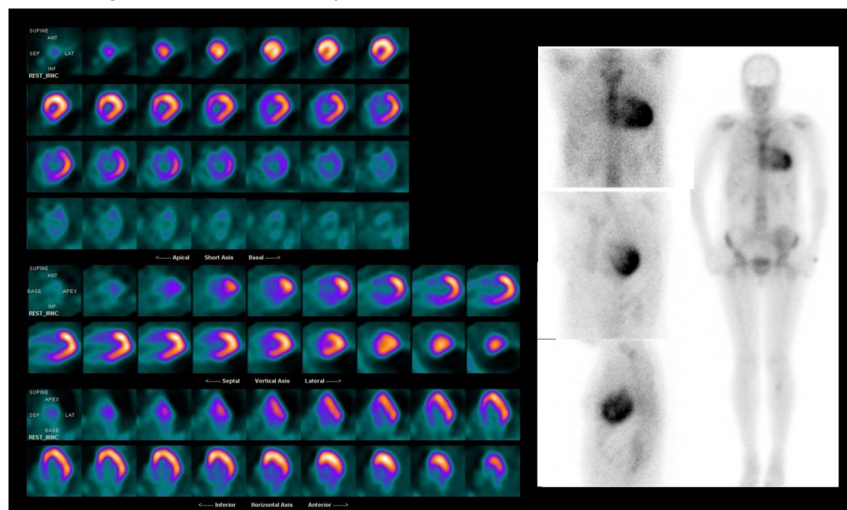
Introduction. Transthyretin cardiac amyloidosis (ATTR-CA) is a progressive disease that significantly reduces patients' quality of life and survival.¹ In our country there are no statistics of this disease, only isolated cases. The ability to diagnose it has dramatically improved since the 2019 Multisociety Consensus for Multimodality Imaging.^{2,3} The study aimed to know patients' demographic and imaging characteristics in suspected ATTR-CA and the prevalence of positive cases in a reference Cardiology Center using 99mTc-pyrophosphate scintigraphy (99mTc-PYP).

Methods. Prospective, observational study approved by Institutional committees. We studied with 99mTc-PYP patients from November 2019 to December 2020 sent to the Nuclear Cardiology Department with clinical suspicion of ATTR-CA and negative light chain quantification. We included parameters as red flags, ECHO suggestive findings (septal thickness >12 mm, diastolic dysfunction), and MRI suggestive findings. ATTR-CA was diagnosed by clinical suspicious, positive scintigraphy, and negative serum studies. 99mTc-PYP were acquired according to current recommendations. Frequency distribution of categorical variables were reported as frequencies and percentages; continuous variables are presented in mean. Mann-Whitney U tests were conducted for continuous variables, while Fisher's exact test was performed for categorical variables.

Results. Due to the Covid-19 pandemic, our Cardiology Hospital reconverted to covid attention; we studied a reduced number, and they were mainly inpatients: total 35 (28-inpatients, 7-outpatients). 21 (60%) were male, 14 (40%) were female, average age was 56.5 yo. 31% heart failure diagnosis, 6%-history of carpal tunnel syndrome and 3%-spinal stenosis. ECHO: 26% had suggestive imaging, 43% with diastolic dysfunction, and 37% had a septal thickness >12mm. MRI: 42.9% had suggestive CA findings. No significant differences were found in the characteristics of suspicion between positive and negative patients. Regarding of the 35 patients scintigraphy, 7 (20%) were positives, establishing ATTR-CA diagnosis, 28 (80%) were negatives. The positivity probability was significant by H/CI ratio, Perugini score, and SPECT findings (p 0.001). Until this protocol started and we share it among hospital physicians, we had never been asked to acquire this type of scintigraphy. Our study shows that if we purposely search for the disease, it can be found. The sample is small due to the limitations we had in the face of the pandemic; however, the study findings are significant for ATTR-CA diagnosis. It is striking that the ECHO and MRI suggestive findings were not statistically significant for the diagnosis.

Conclusions. We present the initial experience of the first study of cardiac amyloidosis in our country, to show the disease's presence and that the diagnosis can be made effectively, quickly, economically, and non-invasively by nuclear medicine scintigraphy.

Abstract Figure. 99mTc-PYP scan positive to ATTR-CA



Abstract Figure. Patients characteristics

Parameter	Total (N=35)	ATTR - (n=28)	ATTR + (n=7)	p-value
General				
Female (%)	14 (40)	10 (35.7)	4 (57.1)	0.401
Male (%)	21 (60)	18 (64.3)	3 (42.9)	-
Age (Years)	56.7 (\pm 13.9)	58.1 (\pm 14.2)	51.3 (\pm 12.4)	0.302
Heart failure n=34 (%)	11 (31.4)	9 (32.1)	2 (28.6)	>0.999
Carpal Tunnel (%)	2 (5.7)	2 (7.1)	0 (0)	>0.999
Spinal Stenosis (%)	1 (2.9)	1 (3.6)	0 (0)	>0.999
Echocardiography n=27				
Septal Thickness >12 mm n=23 (%)	13 (37.1)	11 (39.3)	2 (28.6)	>0.999
Asymmetry n=25 (%)	2 (5.7)	2 (7.1)	0 (0)	>0.999
Reduced LVEF (%)	7 (20)	6 (21.4)	1 (14.3)	>0.999
Diastolic Dysfunction n=25 (%)	15 (42.9)	14 (50)	1 (14.3)	0.267
Suggestive Echocardiography (%)	9 (25.7)	7 (25)	2 (28.6)	0.582
MRI n=18				
Suggestive MRI n=18 (%)	15 (42.9)	14 (50)	1 (14.3)	>0.999
Nuclear Cardiology				
Positive for ATTR (%)	7 (20)	0 (0)	7 (100)	<0.001
Homogenous Distribution Determined by SPECT (%)	8 (22.9)	1 (3.6)	7 (100)	<0.001
High Probability According to 1 hr HCL Ratio n=34 (%)	8 (22.9)	1 (3.6)	7 (100)	<0.001
High Probability According to Perugini Score n=34 (%)	8 (22.9)	1 (3.6)	7 (100)	<0.001

Table 1. Demographic, clinical, and imaging characteristics among patients with positive and negative results for ATTR-CA.