RELIABILITY TEST OF ISCHEMIC BURDEN ASSESSMENT BETWEEN DIFFERENT ACQUISITION TIME INTERVAL IN MYOCARDIAL PERFUSION SCINTIGRAPHY USING WATER PROTOCOL

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INTRODUCTION:

Summed Stress Score (SSS) is one of the parameters from Myocardial Perfusion Imaging (MPI) that can be used to assess ischemic burden and predict the proper treatment. Based on European Association of Nuclear Medicine (EANM) - European Society of Cardiology (ESC) guidelines, patients need to drink fatty milk in order to get high Target to Background Ratio (TBR), but the lactose intolerance of milk in Asian population is quite high about 60-100%. Water can be used as an alternative in patients with lactose intolerance. EANM-ESC guideline mention states that acquisition time in stress MPI is 30-60 minutes after injection of ^{99m}Tc-MIBI intravenously. That will limit number of patients in performing one day protocol MPI in our nuclear department. This study was to analyze the probability of the acquisition could be performed 10-minutes after radiopharmaceutical injection instead of 30-minutes to give shorter waiting time with equal quality of image.

Material & Method:

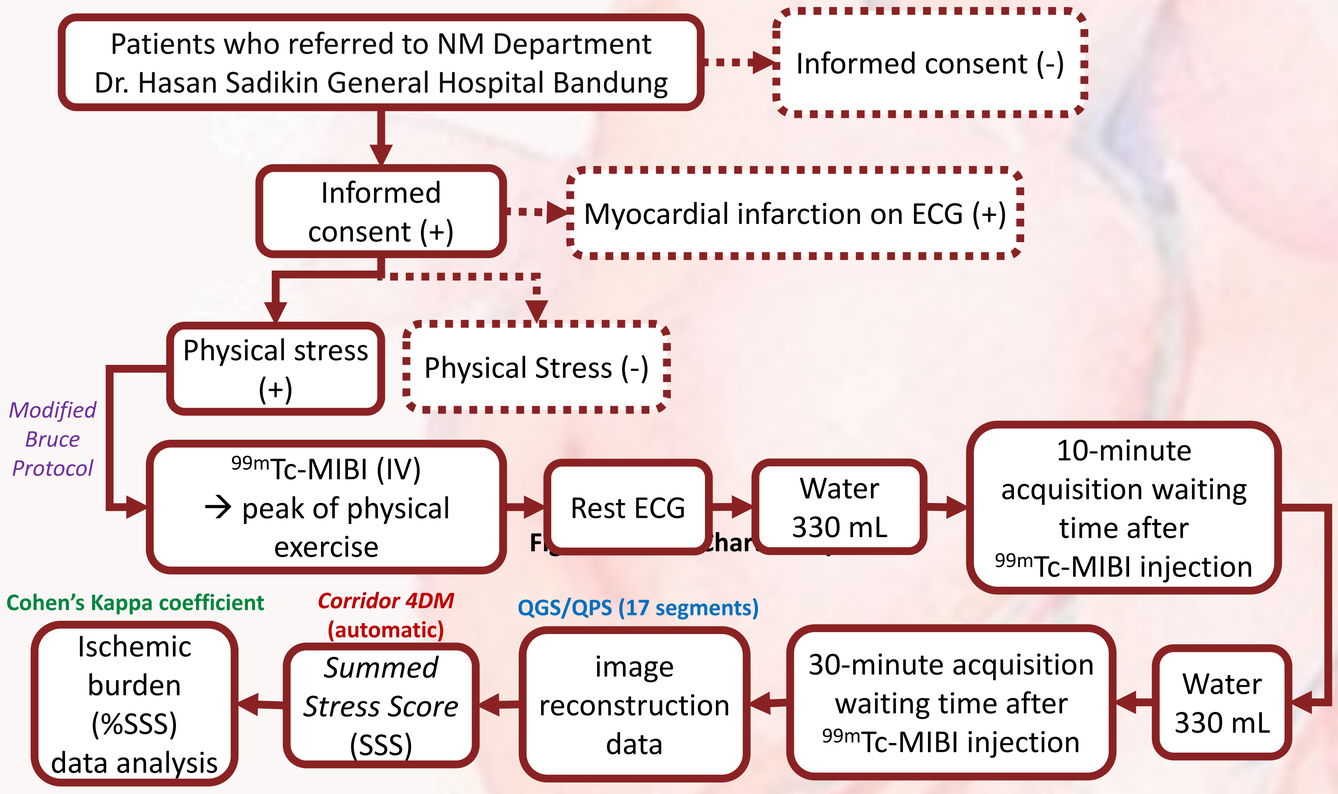

Figure 1. Flow Chart Study

Discussion:

A total of 31 subjects were enroled in this study; 17 male (54.8%) and 14 female (45.2%). There was concordance between ischemic burden at 10- and 30- minute waiting time (κ = 0.84; p-value <0.001). Which mean acquisition time on 10-minutes after injection of ^{99m}Tc-MIBI in stress MPI using water protocol can be used. Might be because of redistribution of ^{99m}Tc-MIBI, as mentioned by Ahmadzadehfar, Sabet, and Sabharwal, 6 subjects have less perfusion defect on 30-minute than on 10-minute acquisition waiting time image. We also found that 4 subjects have more perfusion defect on 30-minute than on 10-minute acquisition waiting time image; the pathophysiology was still unknown.

Result:

Table 1. Subject Characteristic

Subject Characteristic	Total	%
1. Gender		
Male	17	54.8
Female	14	45.2
2. Age		
Range	28 - 80	
Average	48.8	

Table 2. Ischemic burden between 10- and 30- minutes acquisition waiting time

		Ischemic Burden at 30-minute acquisition waiting time			Total
		Low	Moderate	High	
Ischemic Burden at 10-minute acquisition waiting time	Low	**23**	0	0	23
	Moderate	1	**3**	1	5
	High	0	0	**3**	3
Total		24	3	4	31

Table 3. Cohen's Kappa coefficient calculation

	Value	Asymp. Std. Error[a]	Approx. T[b]	Asymp. Sig.
Measure of Agreement Kappa	.838	.105	6.257	.000
N of Valid Cases	31			

a. Not assuming the null hypothesis.
b. Using the asymptomatic standard error assuming the null hypothesis.

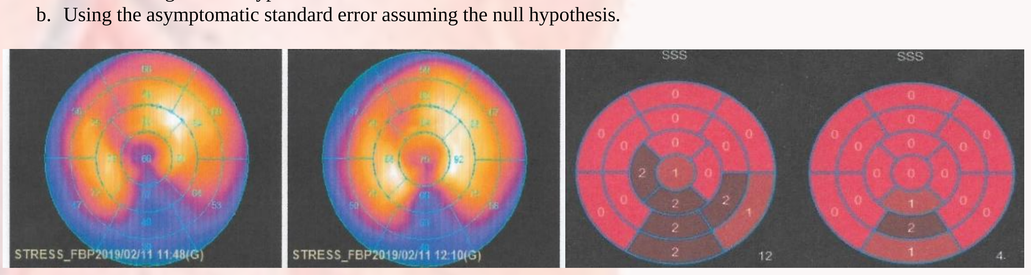

Figure 2. Improving ischemic burden on 30-minutes acquisition waiting time

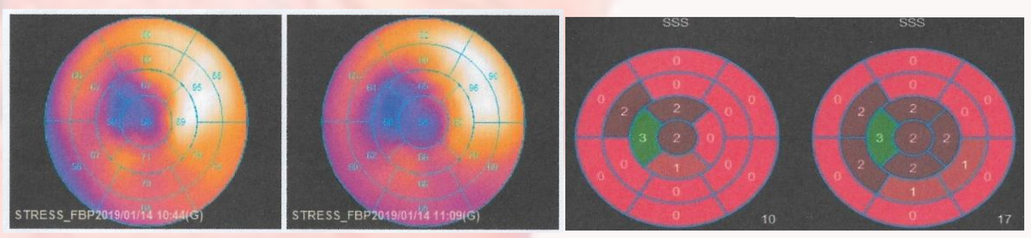

Figure 3. Worsening ischemic burden on 30-minutes acquisition waiting time

Conclusion:

Acquisition time on 10 minutes after injection of ^{99m}Tc-MIBI in stress MPI using water protocol can be used as an alternative to shorten time interval between radiopharmaceutical injection and acquisition time.

Keywords: aquisition time, ischemic burden, myocardial perfusion imaging, water