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Comprehensive Evaluation of Integral Cardiac Rehabilitation in Critical Pathway after

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Abstract Backgrounds and Objectives
Cardiac rehabilitation (CR) has recently emerging as an integral component of critical pathway (CP) of acute coronary syndrome (ACS) in Korea. The aims of this study are to establish the comprehensive data about the body composition, presence of sarcopenia, arterial stiffness, leg isometric strength, gait endurance, and cardiopulmonary fitness during subacute phase after percutaneous coronary intervention (PCI) in OO regional cardiocerebrovascular center.

Methods
The evaluations of arterial stiffness (brachial ankle pulse wave velocity; baPWV) and body composition using bio impedance analysis (BIA) were performed during 4-day admission and skeletal muscle index (SMI) were calculated. The demographic, clinical characteristics including age, gender, the classification of myocardiac infarction (MI) in the presence of ST-segment elevation (STEMI vs NSTEMI) were evaluated. 6-minute walk test (6MWT) and the mean value of isometric muscular strengths of bilateral quadriceps, hamstrings relative to body weight were measured. Cardiopulmonary fitness was evaluated using an expired gas analyzer.

Results
111 patients underwent PCI after ACS and all were referred (100%) for CR from Jan, 2015 to Mar, 2016. 79 patients (72.2%, 60.0 ± 11.2 years, 65 males) conducted exercise stress test (EST) in outpatient clinic. Compared with previously reported values of healthy persons, there were no significant difference in peak aerobic capacity, isometric muscular strength of lower limb, gait endurance and skeletal muscle index, but mean value of BaPWV was increased.

Conclusion
This present study confirmed the baseline values of the comprehensive evaluations in ACS patients during subacute phase after applying the integral cardiac rehabilitation included in critical pathway. Therefore, further studies should be warranted for the individualized and appropriate cardiac rehabilitation according to categorized cardiovascular diseases.

Table 1.General demographic, clinical characteristics and arterial stiffness

Parameters	Numbers = 79
Age (years)	60.0 ± 11.2
Sex (Male:Female)	65 (72.2):14 (27.8)
Height (cm)	165.1±8.2
Weight (kg)	68.8±10.3
BMI (kg/m^2)	25.3±2.6
Classification of MI (NSTEMI:STEMI)	45(57.0):34(43.0)
Duration between onset and assessment of arterial stiffness (days)	3.7±4.2
BaPWV (m/s)	16.2±3.3

Values are presented as number (%) or mean ± standard deviation.

BMI, Body mass index; NSTEMI, non-ST segment elevation myocardial infarction; STEMI, ST segment elevation myocardial infarction; BaPWV, brachial ankle pulse wave velocity

Table 2. Parameters of Body composition, gait endurance and Isometric muscular strength of Lower extremities

Parameters	Numbers = 79
Body composition	
Muscle mass	48.4±8.4
Fat mass	17.9±5.3
SMI	7.6±1.0
(male: female)	(7.8±0.8:6.5±0.8)
6MWT (meters)	425.4±81.4
Isometric muscular strength	
Qceps (PT)	108.9±34.4
Ham (PT)	65.1±23.2
QcepsBW	1.6±0.4
HamBW	0.9±0.3

Values are presented as mean ± standard deviation, *$p<0.05$

SMI, skeletal muscle index; 6MWT, Six minute walk test; Qceps, quadriceps; PT, peak torque; Ham, hamstrings; QcepsBW, peak torque of quadriceps relative to body weight; HamBW, peak torque of hamstrings relative to body weight

Table 3. Cardiopulmonary parameters in all post-PCI patients

Parameters	Numbers = 79
Duration from onset to ETT (days)	18.3±5.9
Cardiopulmonary parameters	
VO_{2peak}	28.1±6.8
RHR	75.0±13.4
RSBP	120.5±14.9
RDBP	72.8±9.2
PHR	131.7±20.8
PSBP	158.3±25.9
PDBP	74.8±11.8
RPP_{peak}	20810.4±5199.0
ETT duration (seconds)	783.7±232.1
RER	1.0±0.1

Values are presented as mean ± standard deviation, *$p<0.05$

VO_{2peak}, peak oxygen consumption; RHR, resting heart rate; RSBP, resting systolic blood pressure; RDBP, resting diastolic blood pressure; PHR, peak heart rate; PSBP, peak systolic blood pressure; PDBP, peak diastolic blood pressure; RPP_{peak}, peak rate pressure product; ETT, exercise tolerance test; RER, respiratory exchange ratio