CHAPTER IV

RESULTS

Subject characteristics

Twelve men with type 2 DM were voluntarily participated into this study. All subjects completed all the tests. Seven ex-smokers ($\geq$ 10 years) were recruited into study because of two reasons. Firstly, previous studies reported that the annual decline of FEV_1 in ex-smokers (> 5 yrs) was similar in healthy never smokers (64, Pride, 2006 #82, 65). Secondly, subjects' PFTs in this study were within normal limits. However, one ex-smoker was excluded from data analysis due to his smoking history possibly confounding the results. This was because his PFTs was lower than normal limit (pred FEV_1 = 73.54%, pred FVC = 75% and FEV_1/FVC = 79.23%). Thus, data from eleven subjects (six ex-smokers and five non- smokers) would be used for further data analysis.

The demographic data were presented in Table1. The mean age, weight, and height were 60.55 $\pm$ 5.59 years, 74.02 $\pm$ 14.72 kg, and 168.28 $\pm$ 7.99 cm, respectively. The subjects were classified as obese I (mean BMI = 25.99 $\pm$ 3.70 kg/m^2) (66). The subjects were diagnosed as DM for 5-19 years. Their fasting glucose level was 134.18 $\pm$ 19.89 (range = 88-156 mg/dl).

Table 1. The subject demographic data (n=11).

Variables	Mean ± SD
Age (years)	60.55 ± 5.59
Weight (kg)	74.02 ± 14.72
Height (cm)	168.28 ± 7.99
Body mass index (kg/m^2)	25.99 ± 3.70
Diabetes duration (years)	9.64 ± 4.82
Fasting glucose level (mg/dl)	134.18 ± 19.89

PFTs, isokinetic muscle strength tests and 6MWT

As shown in Table 2, the mean FVC and FEV_1 were 3.43 ± 0.62 and 2.69 ± 0.48 L, respectively. The mean FEV_1/FVC, pred FVC and pred FEV_1 were 78.56 ± 4.23, 100.24 ± 10.47 and 101.13 ± 11.03 %, respectively. These PFTs were well within normal limits for all subjects.

The maximum isokinetic muscle strength tests were indicated by peak torque. The mean peak torque of knee extensors, knee flexors, ankle dorsiflexors and plantarflexors were 107.35 ± 22.11, 65.77 ± 17.41, 14.15 ± 4.85, and 50.25 ± 8.08 Nm, respectively.

The 6MWT was performed in a 25m corridor. The mean resting heart rate and mean HRim were 73.45 ± 12.80 and 100.00 ± 20.30 bmp, respectively. The mean 6MWD was 496.88 ± 62.11 m.

Table 2. Results of PFTs, isokinetic muscle strength tests and 6MWT (n=11)

Variables	Mean ± SD
PFTs	
FVC (L)	3.43 ± 0.62
FEV_1 (L)	2.69 ± 0.48
FEV_1/FVC (%)	78.56 ± 4.23
pred FVC (%)	100.24 ± 10.47
pred FEV_1 (%)	101.13 ± 11.03
Isokinetic muscle strength test	
Knee extensor (Nm)	107.35 ± 22.11
Knee flexor (Nm)	65.77 ± 17.41
Ankle dorsiflexor (Nm)	14.15 ± 4.85
Ankle plantarflexor (Nm)	50.25 ± 8.08
6MWT	
6MWD (m)	496.88 ± 62.11
Resting heart rate (bpm)	73.45 ± 12.80
HRim (bpm)	100.00 ± 20.30

Note: FVC = forced vital capacity, FEV_1 = forced expiratory volume in 1 second,

pred FVC = predicted value of FVC, pred FEV_1 = predicted value of FEV_1,

HRim = heart rate immediately after the test, 6MWD = six minute walk distance

Demographic data, PFTs, peak torque, and end heart rate correlated with 6MWD

Table 3 presented the correlations between 6MWD and demographic data, PFTs, peak torque, and HRim. Statistically significant correlation between 6MWD with HRim (r = 0.635, $p < 0.05$) and peak torque of knee flexor (r = 0.609, $p < 0.05$) were found. The 6MWD was not statistically correlated with demographic data, PFTs, peak torque of knee extensor, peak torque of ankle dorsiflexor and peak torque of plantar flexor.

The 6MWD could be predicted by using peak torque of knee flexor and HRim. These predictors could explain 30.1% and 33.7% of variance in 6MWD in male patients with type 2 DM. These equations were:

6MWD (m) = 1.943*HRim (bpm) + 302.567

(r = 0.635, r^2 = 0.403, adjust r^2 = 0.337, $p < 0.05$, SEE = 50.57)

6MWD (m) = 2.172* peak torque of knee flexor (Nm) + 354.025

(r = 0.609, r^2 = 0.371, adjust r^2 = 0.301, $p < 0.05$, SEE = 51.94).

Table 3. Relationship between the 6MWD and variables (n=11)

Variables	6MWD (m)	*p* value
Age (years)	0.195	0.566
Weight (kg)	0.11	0.974
Height (cm)	0.276	0.412
BMI (kg/m^2)	-0.163	0.632
FVC (L)	0.350	0.291
pred FVC (%)	0.531	0.93
FEV$_1$ (L)	0.337	0.311
pred FEV$_1$ (%)	0.553	0.78
FEV$_1$/FVC (%)	-0.067	0.845
Peak torque of knee extensor (Nm)	0.433	0.184
Peak torque of knee flexor (Nm)	0.609*	0.047
Peak torque of ankle dorsiflexor (Nm)	0.082	0.810
Peak torque of ankle plantar flexor (Nm)	0.488	0.128
HRim (bpm)	0.635*	0.036

Note: FVC = forced vital capacity, FEV$_1$ = forced expiratory volume in 1 second,

pred FVC = predicted value of FVC, pred FEV$_1$ = predicted value of FEV$_1$,

HRim = heart rate immediately after the test, 6MWD = six minute walk distance