LIST OF TABLES

Table 1: Most common pathogns isolated from patients with COPD 9

Table 2: Classification of severity of airflow limitation according to GOLD criteria 33

Table 3: Calculation of the BODE index 34

Table 4: Classification of BMI according to WHO 34

Table 5: The modified Medical Research Council scale for assessing the severity of breathlessness 34

Table 6: Categorization of the patients according to the combined COPD assessment classification 35

Table 7: Normal values of leptin 35

Table 8: Characteristics of the study population 37

Table 9: Comparison of BMI in the different groups of the stable COPD patients 38

Table 10: Comparison between the patients' groups according to FEV1/FVC and FEV1% 40

Table 11: Comparison between the two patients' subgroups according to mMRC 41

Table 12: Comparison between the two studied groups according to GOLD stage and Combined COPD assessment classification 43

Table 13: Comparison between the two studied groups according to BODE score 44

Table 14: Comparison between the three studied groups according to CRP 45

Table 15: Comparison between the three studied groups according to leptin 46

Table 16: Correlations of BMI in the stable COPD subgroup 48

Table 17: Correlation between mMRC scores and other functional parameters in each group 50

Table 18: Correlation between 6MWT measurement and other functional parameters in each group 54

Table 19: Correlations between BODE score and different studied parameters in the study group 56

Table 20: Correlation between CRP and different studied parameters in patients' groups 62

Table 21: Correlations between leptin and different studied parameters in the study population. 66

LIST OF FIGURES

Figure 1: Schemtic presentation of alveolar units 6
Figure 2: The relatioship between the excercise tidal flow-volume loops and the baseline maximal flow volume loop 7
Figure 3: Model of symptom/risk assessment of evaluation of COPD 15
Figure 4: Biological response to high versus low leptin levels..... 21
Figure 5: Pathogenesis of obesity. 24
Figure 6: Relation between BMI and GOLD stages in the stable COPD subgroup 38
Figure 7: Relation between BMI and combined COPD assessment groups in the stable COPD subgroup..... 39
Figure 8: Comparison between COPD exacerbation and stable subgroups according to 6MWT41
Figure 9: Percentage of the very severe cases as shown by GOLD stages and the combined COPD assessment in COPD exacerbation subgroup 43
Figure 10: Comparison between the three studied groups according to CRP 45
Figure 11: Comparison between the three studied groups according to leptin..... 47
Figure 12: Correlation between BMI and GOLD staging in stable COPD subgroup..... 48
Figure 13: Correlation between mMRC scores and BMI in stable COPD subgroup 49
Figure 14: Correlation between mMRC score and FEV1% in COPD exacerbation subgroup ... 50
Figure 15: Correlation between mMRC score and FEV1/FVC in COPD exacerbation subgroup 51
Figure 16: Correlation between mMRC score and GOLD stages in COPD exacerbation subgroup.....51
Figure 17: Correlation between mMRC score and 6MWT in COPD exacerbation subgroup 52
Figure 18: Correlation between mMRC score and EFV1/FVC% in stable COPD subgroup..... 52
Figure 19: Correlation between mMRC score and GOLD stages in stable COPD subgroup 53
Figure 20: Correlation between 6MWT and FEV1% in COPD execration subgroup..... 54
Figure 21: Correlation between 6MWT and FEV1% in stable COPD subgroup 55
Figure 22: Correlation between 6MWT and GOLD stages in COPD exacerbation subgroup.... 55
Figure 23: Correlation between BODE score and GOLD stage in COPD exacerbation subgroup 57

Figure 24: Correlation between BODE score and combined COPD assessment groups in COPD exacerbation subgroup 57
Figure 25: Correlation between CRP with BODE score in COPD exacerbation subgroup 58
Figure 26: Correlation between leptin and BODE score in COPD exacerbation subgroup 58
Figure 27: Correlation between BODE score and FEV1/ FVC ratio in COPD exacerbation subgroup 59
Figure 28: Correlation between BODE score and GOLD stages in stable COPD subgroup..... 59
Figure 29: Correlation between BODE score and combined COPD assessment in stable COPD subgroup 60
Figure 30: Correlation between BODE score and FEV1/ FVC ratio in stable COPD subgroup. 60
Figure 31: Correlation between leptin and BODE score in stable COPD subgroup 61
Figure 32: Correlation between CRP and leptin in COPD exacerbation subgroup 63
Figure 33: Correlation between CRP and FEV1% in COPD exacerbation subgroup 63
Figure 34: Correlation between CRP and 6MWT in COPD exacerbation subgroup 64
Figure 35: Correlation between CRP and leptin in stable COPD subgroup 64
Figure 36: Correlation between CRP and 6MWT in stable COPD subgroup 65
Figure 37: Correlation between leptin and GOLD staging in COPD exacerbation subgroup..... 66
Figure 38: Correlation between leptin and combined COPD assessment in COPD exacerbation subgroup 67
Figure 39: Correlation between leptin with mMRC in COPD exacerbation subgroup 67
Figure 40: Correlation between leptin and predicted FEV1% in COPD exacerbation subgroup 68
Figure 41: Correlation between leptin and 6MWT in COPD exacerbation subgroup..... 68
Figure 42: Correlation between leptin and BMI (kg/m^2) in stable COPD subgroup..... 69
Figure 43: Correlation between leptin and GOLD staging in stable COPD subgroup..... 70
Figure 44: Correlation between leptin and BMI in control group B..... 70

LIST OF ABBREVIATIONS

6MWT	Six-minute walk test
ACOS	Asthma-COPD overlap syndrome
ALI	Acute Lung Injury
ANOVA	Analysis of variance
ARC	Arcuate nucleus
ART	Agouti-related transcript
ATS	American thoracic society
ATT	Alpha One Antitrypsin
BMI	Body Mass Index
CAD	Coronary artery disease
CAT :	COPD assessment test
CCQ:	COPD control questionnaire
COPD:	Chronic obstructive pulmonary disease
CRH:	Corticotropin-releasing hormone
CRP:	C-Reactive Protein
CRQ:	Chronic respiratory questionnaire
DLCO:	Diffusion Lung Capacity for Carbon monoxide
EELV:	End Expiratory Lung Volume
EFL:	Expiratory Flow Limitation
EGFR:	Epidermal growth factor receptor
FEV:	Forced expiratory volume
FVC:	Forced vital capacity
GM-CSF:	Granulocyte-Macrophage Colony Stimulating Factor
GOLD:	Global Initiative For Chronic Obstructive Pulmonary disease
HA:	Hypothalamic amenorrhea
HAART	Highly active anti-retroviral therapy
HIF-1:	Hypoxia-inducible factor-1
HRCT:	High Resolution Computed Tomography
IC:	Inspiratory Capacity
IL:	Interleukin
$^{KW}X^2$:	Kruskal Wallis test
LD:	Lipodystrophy
LVRS:	Lung Volume Reduction Surgery
MC:	Monte Carlo test
MC-4:	Melanocortin-4 receptor
MIC-1:	Macrophage inhibitory cytokine-1
mMRC:	Modified Medical Research Council
MSH:	Melanocyte stimulating hormone
nCPAP:	Nasal continuous positive airway pressure
NIPPV:	Non-Invasive Positive Pressure Ventilation
NIV:	Non-invasive Ventilation

NK cells:	Natural Killer cells
NPY:	Neuropeptide Y
NSCLC:	Non-small cell lung cancer
OSA:	Obstructive sleep apnoea
OSAHS:	Obstructive sleep apnea-hypopnea syndrome
PI:	Protease Inhibitor
PL:	Lung Recoil
POMC:	Pro-opiomelanocortin
QoL:	Quality of life
ROS:	Reactive oxygen species
rs:	Spearman coefficient
SD:	Standard deviations
SGRQ:	St George's Respiratory Questionnaire
t:	Student t-test
TGF:	Transforming growth factor
TIMPs:	Tissue inhibitor of metalloproteinases
TNF-α:	Tumor necrosis factor alpha
VEGF:	Vascular endothelial growth factor
Vr:	Relaxation volume
WHO:	World Health Organization
X^2:	Chi square test
Z:	Mann Whitney test