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# List of Abbreviations

**5HT2c** .....selective serotonin 2C receptor

**ACR**.....American College of Rheumatology

**ADA**.....American Diabetes Association

**AHA**.....American Heart Association

**AHEAD** .....Action for Health in Diabetes

**ALI**.....acute lung injury

**ALP**.....alkaline phosphatase

**ALT**.....alanine transaminase

**AMPK** .....adenosine monophosphate -activated protein kinase

**ANCA**.....antineutrophil cytoplasmic antibody

**anti-dsDNA**.....anti-double stranded deoxyribonucleic acid

**apoB** .....Apolipoprotein B

**AS**.....ankylosing spondylitis

**AST**.....aspartate transaminase

**AT**.....adipose tissues

**BAT** .....brown adipose tissues

**BD** .....Behçet's disease

**BILAG**.....British Iseles Lupus Assessment Group´s disease activityindex

**BLOOM**.....Behavioral Modification and Lorcaserin for Overweight and Obesity Management

**BLOOM-DM** .....Behavioral Modification and Lorcaserin for Obesity and Overweight Management in Diabetes Mellitus

## List of Abbreviations(Cont.)

**BLOSSOM**.....Behavioral Modification and Lorcaserin Second Study for Obesity Management

**BMI**.....Body mass index

**BPH** .....benign prostatic hyperplasia

**BUN** .....blood urea nitrogen

**CADs** .....coronary artery diseases

**CE**.....cholesterol esters

**CETP** .....cholesterol ester transfer protein

**CHD**.....coronary heart disease

**ChemR23** .....Chemerin Receptor 23

**CKD**.....chronic kidney disease

**cm** .....centimeter

**CMKLR1**.....G-coupled receptor chemokine-like receptor 1

**CNS** .....central nervous system

**CRP** .....C-reactive protein

**CS**.....Corticosteroids

**CT**.....computed tomography

**CVD** .....cardiovascular diseases

**DBP** .....diastolic blood pressure,

**DEXA**.....dual-energy X-ray absorptiometry

**DM**.....diabetes mellitus

**DXA**.....dual x-ray absorptiometry

**ELISA** .....Enzyme-Linked Immunosorbent Assay

**ER** .....Extended Release

## List of Abbreviations(Cont.)

**ESR** .....erythrocyte sedimentation rate

**FBG** .....fasting blood glucose

**FDA** .....Food and Drug Administration

**FFAs** .....free fatty acids

**FMD**.....flow-mediated dilation

**GC** .....glucocorticoid

**GFR** .....glomerular filtration rate

**GLUT4** .....Glucose transporter type 4

**gm** .....gram

**gm/dl** .....grams per deciliter.

**Hb**.....Hemoglobin

**HbA1c**.....Glycated hemoglobin A1

**HDL** .....high-density lipoprotein

**HIV** .....human immunodeficiency virus

**hsCRP**.....high sensitive CRP

**HTN** .....hypertension

**IASO** .....International Association for the Study of Obesity

**IBD** .....inflammatory bowel disease

**ICAM** .....intercellular adhesion molecules

**IFG** .....Impaired Fasting Glucose

**IFN-γ** .....Interferon gamma

**IgF** .....insulin growth factor

**IgG**.....Immunoglobulin G

**IGT** .....Impaired Glucose Tolerance

**IL1-Ra** .....interleukin-1 receptor antagonist

## List of Abbreviations(Cont.)

**IL-6**.....interleukin-6

**IMT**.....intima-media thickness

**IOTF**.....International Obesity Taskforce

**IP-10**.....interferon gamma-induced protein 10

**IQR**.....Interquartile range

IR.....insulin resistance

**IRA**.....infarct-related artery

**kg/m2**.....kilogram per meter square.

**LAGB**.....laparoscopic adjustable gastric band

**LCL-C**.....low-density lipoprotein cholesterol

**LCN2**.....Lipocalin 2

**LDL**.....Low-density lipoprotein

**LEP gene**.....leptin gene

**LH**.....luteinizing hormone

**LPS**.....lipopolysaccharide

**LRYGB**.....Laparoscopic Roux-en-Y gastric bypass

**MCP-1**.....monocyte chemoattractant protein-1

**mEq/L**.....mili equivalent per liter

**MetS**.....metabolic syndrome

**mg**.....milligram

**mg/dl**.....milligrams per deciliter

**mg/l**.....milligrams per liter

**MI**.....myocardial infarction

**MIP-1α**.....Macrophage inflammatory protein1α

**ml**.....milliliter

**mm/hr**.....milliliter per hour

## List of Abbreviations(Cont.)

**mmHg** .....milliliter mercury

**MMPS** .....Matrix metalloproteinases

**MRI** .....magnetic resonance imaging

**mRNA**.....messanger RNA

**NAD** .....nicotinamide adenine dinucleotide

**NAFLD**.....Non-alcoholic fatty liver disease

**Nampt** .....nicotinamidephosphoribosyl-transferase

**NASH**.....Nonalcoholic steatohepatitis

**NCEP/ATP III**.....National Cholesterol Education Program/ Adult Treatment Panel III

**ng/ml**.....nano grams per milliliter

**NGAL**.....neutrophil gelatinase-associated lipocalin

**NHANES** .....The National Health and Nutrition Examination Survey

**NHLBI**.....National Heart, Lung, and Blood Institute

**NIH**.....National Institutes of health

**NK** .....Natural killer

**NO** .....nitric oxide

**NSAIDs**.....non-steroidal anti- inflammatory drugs

**NZBWF1mouse**.....New Zealand Black/White F1mouse

**OA** .....osteoarthritis

**obgene**.....obese gene

## List of Abbreviations(Cont.)

**PAI-1** .....plasminogen activator inhibitor-1

**PBEF** .....pre-B cell colony-enhancing factor

**PBMCs**.....peripheral blood mononuclear cells

**PCOS** .....Polycystic ovary syndrome

**PGE2** .....prostaglandin E2

**PLTs** .....platelet count

**PPAR-α** .....Peroxisome proliferator-activated receptor alpha

**PUFA** .....Polyunsaturated fatty acids

**RA** .....rheumatoid arthritis

**RAAS** .....renin-angiotensin-aldosterone system

**RANTES**.....Chemokine (C-C motif) ligand 5 (also CCL5) regulated on activation, normal T cell expressed and secreted.

**RARRES2** .....retinoic acid receptor responder 2

**RBP4** .....Retinol binding protein 4

**RCT** .....randomized control trial

**REM** .....rapid eye movement

**RNA**.....ribonucleic acid

**SAA**.....serum amyloid A

**SAT**.....Subcutaneous adipose tissues

**SBP**.....systolic blood pressure

**sc**.....subcutaneous

**SCH** .....Subclinical hypothyroidism

## List of Abbreviations(Cont.)

**SD**.....standard deviation

**Serpin**.....serine protease inhibitor

**SF**.....subcutaneous fat

**SFs**.....synovial fibroblasts

**SHBG**.....sex-hormone-binding globulin

**SLE**.....Systemic Lupus Erythematosus

**SSc**.....systemic sclerosis

**STEMI**.....ST-segment elevation myocardial infarction

**SVC**.....stromal vascular compartment

**T2DM**.....type 2 diabetes mellitus

**TG**.....triglycerides

**TID**.....three times per day

**TNFα**.....Tumor necrosis factorα

**TNZ**.....thermoneutral zone

**U/L**.....units/liter

**VAT**.....visceral adipose tissues

**VEGF**.....vascular endothelial growth factor

**VF**.....visceral fat

**VLA**.....valued life activity

**VLDL**.....very-low-density lipoprotein

**VTE**.....Venous thromboembolism

**WAT**.....white adipose tissue

**WBCs**.....white blood cells

**WHO**.....World Health Organization

**WHR**.....waist-to-hip ratio

**μU/ml**.....micro unit per milliliter

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# Introduction

The nutritional status of systemic lupus erythematosus (SLE) patients has a great impact on the disease course and prognosis ***(Santos etal., 2010).***

Obesity is the most common nutritional disorder worldwide and it has a special importance in SLE patients, prolonged corticosteroid therapy add to the obesity risk in those patients***(Chaiamnuay et al., 2007).***

The integration between nutritional status and immunityis detrimental. Malnutrition causes immunosuppression and obesity, which trigger systemic inflammation and can modify the individual's response to a particular antigen ***(Hajer et al., 2008).***

The prevalence of autoimmune diseases are significantly rising in the developing worldrecently and the highest incidence being in the industrial regions suggesting that Western diet, lifestyle modificationsand environmental pollutions might contribute to this flare ***(Shapira et al., 2010).***

Adipose tissue is regarded as an immuno-endocrine organ that actively secrets numerous adipocytokines: lipten, risiten, adiponectin and visfatin these proinflammatory cytokines directly affect the immune system and they are responsible for the immuno-metabolic interplay between the immune system and the metabolic processes; insulin resistance and atherosclerosis. In addition to adipocytokines adipose tissue secrets inflammatory