View metadata, citation and similar papers at core.ac.uk

brought to you by CORE

provided by UGD Academic Repository

UDK 37

ISSN 2545 - 4439
ISSN 1857 - 923X

INTERNATIONAL JOURNAL

Institute of Knowledge Management

KNOWLEDGE

Scientific Papers

Vol. 31. 4.

MEDICAL SCIENCES AND HEALTH

KIJ Vol. 31 No. 4 pp. 811 - 1198 Skopje 2019

Global Impact & Quality Factor 1.822 (2107) http://globalimpactfactor.com/knowledge-international-journal/

KNOWLEDGE

INTERNATIONAL JOURNAL

SCIENTIFIC PAPERS
VOL. 31.4

Promoted in Budva, Montenegro
June, 2019

INSTITUTE OF KNOWLEDGE MANAGEMENT
SKOPJE

KNOWLEDGE

International Journal Scientific papers Vol. 31.4

ADVISORY BOARD

Vlado Kambovski PhD, Robert Dimitrovski PhD, Siniša Zarić PhD, Maria Kavdanska PhD, Venelin Terziev PhD, Mirjana Borota – Popovska PhD, Cezar Birzea PhD, Ljubomir Kekenovski PhD, Veselin Videv PhD, Ivo Zupanovic, PhD, Savo Ashtalkoski PhD, Zivota Radosavljević PhD, Laste Spasovski PhD, Mersad Mujevic PhD, Nonka Mateva PhD, Rositsa Chobanova PhD, Predrag Trajković PhD, Dzulijana Tomovska PhD, Nedzad Korajlić PhD, Nebojsha Pavlović PhD, Nikolina Ognenska PhD, Baki Koleci PhD, Lisen Bashkurti PhD, Trajce Dojcinovski PhD, Jana Merdzanova PhD, Zoran Srzentić PhD, Nikolai Sashkov Cankov PhD, Marija Kostic PhD

Print: GRAFOPROM – Bitola

Editor: IKM – Skopje

Editor in chief
Robert Dimitrovski, PhD

KNOWLEDGE - International Journal Scientific Papers Vol. 31.4

ISSN 1857-923X (for e-version)
ISSN 2545 – 4439 (for printed version)

INTERNATIONAL EDITORIAL BOARD

President: Academic, Prof. Vlado Kambovski PhD, Skopje (Macedonia)

Vice presidents:
Prof. Robert Dimitrovski PhD, Institute of Knowledge Management, Skopje (Macedonia)
Prof. Sinisa Zaric, PhD, Faculty of Economics, University of Belgrade, Belgrade (Serbia)
Prof. Venelin Terziev PhD, University of Rousse, Rousse (Bulgaria)
Prof. Mersad Mujevic PhD, Public Procurement Administration of Montenegro (Montenegro)
Prof. Tihomir Domazet PhD, President of the Croatian Institute for Finance and Accounting, Zagreb (Croatia)

Members:

- Prof. Aleksandar Korablev PhD, Dean, Faculty for economy and management, Saint Petrsburg State Forest Technical University, Saint Petrsburg (Russian Federation)
- Prof. Azra Adjajlic – Dedovic PhD, Faculty of criminology and security, Sarajevo (Bosnia & Herzegovina)
- Prof. Anita Trajkovska PhD, Rochester University (USA)
- Prof. Anka Trajkovska-Petkoska PhD, UKLO, Faculty of technology and technical sciences, Bitola (Macedonia)
- Prof. Alisabri Sabani PhD, Faculty of criminology and security, Sarajevo (Bosnia & Herzegovina)
- Prof. Ahmad Zakeri PhD, University of Wolverhampton, (United Kingdom)
- Prof. Ana Dzumalieva PhD, South-West University "Neofit Rilski", Blagoevgrad (Bulgaria)
- Prof. Aziz Pollozhani PhD, Rector, University Mother Teresa, Skopje (Macedonia)
- Prof. Branko Sotirov PhD, University of Rousse, Rousse (Bulgaria)
- Prof. Branko Boshkovic, PhD, College of Sports and Health, Belgrade (Serbia)
- Prof. Branimir Kampl PhD, Institute SANO, Zagreb (Croatia)
- Prof. Baki Koleci PhD, University Hadzi Zeka, Peya (Kosovo)
- Prof. Branislav Simonovic PhD, Faculty of Law, Kragujevac (Serbia)
  Prof. Bistra Angelovska, Faculty of Medicine, University "Goce Delcev", Shtip (Macedonia)
- Prof. Cezar Birzea, PhD, National School for Political and Administrative Studies, Bucharest (Romania)
- Prof. Cvetko Andreevski, Dean, Faculty of Tourism, UKLO, Bitola (Macedonia)
- Prof. Drago Cvijanovic, PhD, Faculty of Hotel Management and Tourism, University of Kragujevac, Vrnjacka Banja (Serbia)
- Prof. Dusan Ristic, PhD Emeritus, College of professional studies in Management and Business Communication, Novi Sad (Serbia)
- Prof. Dimitar Radev, PhD, Rector, University of Telecommunications and Post, Sofia (Bulgaria)
- Prof. Daniela Todorova PhD, Rector of "Todor Kableshkov" University of Transport, Sofia (Bulgaria)
- Prof. Dragan Kokovic PhD, University of Novi Sad, Novi Sad (Serbia)
- Prof. Dragan Marinkovic PhD, High health – sanitary school for professional studies, Belgrade (Serbia)
- Prof. Daniela Ivanova Popova PhD, Faculty of Public Health and Sport, SWU Neofit Rilski, Blagoevgrad (Bulgaria)
- Prof. Dzulijana Tomovska, PhD, Dean, Faculty of Biotechnical sciences, Bitola(Macedonia)
- Prof. Evgenia Penkova-Pantaleeva PhD, UNWE -Sofia (Bulgaria)

- Prof. Fadil Millaku, PhD, Rector, University "Hadzi Zeka", Peja (Kosovo)
- Prof. Fatos Ukaj, University "Hasan Prishtina", Prishtina (Kosovo)
- Prof. Georgi Georgiev PhD, National Military University "Vasil Levski", Veliko Trnovo (Bulgaria)
- Prof. Halit Shabani, PhD, University "Hadzi Zeka", Peja (Kosovo)
- Prof. Halima Sofradzija, PhD, University of Sarajevo, Saraevo (Bosnia and Herzegovina)
- Prof. Haris Halilovic, Faculty of criminology and security, University of Sarajevo, Saraevo (Bosnia and Herzegovina)
- Prof. Helmut Shramke PhD, former Head of the University of Vienna Reform Group (Austria)
- Prof. Hristina Georgieva Yancheva, PhD, Rector, Agricultural University, Plovdiv (Bulgaria)
- Prof. Hristo Beloev PhD, Bulgarian Academy of Science, Rector of the University of Rousse (Bulgaria)
    - Prof. Hristina Milcheva, Medical college, Trakia University, Stara Zagora (Bulgaria)
- Prof. Izet Zeqiri, PhD, Academic, SEEU, Tetovo (Macedonia)
- Prof. Ivan Marchevski, PhD, Rector, D.A. Tsenov Academy of Economics, Svishtov (Bulgaria)
- Doc. Igor Stubelj, PhD, PhD, Faculty of Management, Primorska University, Koper (Slovenia)
- Prof. Ivo Zupanovic, PhD, Faculty of Business and Tourism, Budva (Montenegro)
- Prof. Ivan Petkov PhD, Rector, European Polytechnic University, Pernik (Bulgaria)
- Prof. Isa Spahiu PhD, AAB University, Prishtina (Kosovo)
- Prof. Ivana Jelik PhD, University of Podgorica, Faculty of Law, Podgorica (Montenegro)
- Prof. Islam Hasani PhD, Kingston University (Bahrein)
- Prof. Jova Ateljevic PhD, Faculty of Economy, University of Banja Luka, (Bosnia & Herzegovina)
- Prof. Jove Kekenovski PhD, Faculty of Tourism, UKLO , Bitola (Macedonia)
- Prof. Jonko Kunchev PhD, University „Cernorizec Hrabar" - Varna (Bulgaria)
- Prof. Jelena Stojanovic PhD, High medicine school for professional studies "Hipokrat", Bujanovac (Serbia)
- Prof Karl Schopf, PhD, Akademie fur wissenschaftliche forchung und studium, Wien (Austria)
- Prof. Katerina Belichovska, PhD, Faculty of Agricultural Sciences, UKIM, Skopje (Macedonia)
- Prof. Krasimir Petkov, PhD, National Sports Academy "Vassil Levski", Sofia (Bulgaria)
- Prof. Kamal Al-Nakib PhD, College of Business Administration Department, Kingdom University (Bahrain)
- Prof. Kiril Lisichkov, Faculty of Technology and Metallurgy, UKIM, Skopje (Macedonia)
- Prof. Lidija Tozi PhD, Faculty of Pharmacy, Ss. Cyril and Methodius University, Skopje (Macedonia)
- Prof. Laste Spasovski PhD, Vocational and educational centre, Skopje (Macedonia)
- Prof. Larisa Velic, PhD, Faculty of Law, University of Zenica, Zenica (Bosnia and Herzegovina)
- Prof. Lujza Grueva, PhD, Faculty of Medical Sciences, UKIM, Skopje (Macedonia)
- Prof. Lazar Stosic, PhD, Association for development of science, engineering and education, Vranje (Serbia)
- Prof. Lisen Bashkurti PhD, Global Vice President of Sun Moon University (Albania)
- Prof. Lence Mircevska PhD, High Medicine School, Bitola, (Macedonia)
- Prof. Ljubomir Kekenovski PhD, Faculty of Economics, UKIM, Skopje (Macedonia)
- Prof. Ljupce Kocovski PhD, Faculty of Biotechnical sciences, Bitola (Macedonia)

- Prof. Marusya Lyubcheva PhD, University "Prof. Asen Zlatarov", Member of the European Parliament, Burgas (Bulgaria)
- Prof. Maria Kavdanska PhD, Faculty of Pedagogy, South-West University Neofit Rilski, Blagoevgrad (Bulgaria)
- Prof. Maja Lubenova Cholakova PhD, Faculty of Public Health and Sport, SWU Neofit Rilski, Blagoevgrad (Bulgaria)
- Prof. Mirjana Borota-Popovska, PhD, Centre for Management and Human Resource Development, Institute for Sociological, Political and Juridical Research, Skopje (Macedonia)
- Prof. Mihail Garevski, PhD, Institute of Earthquake Engineering and Engineering Seismology, Skopje (Macedonia)
- Prof. Misho Hristovski PhD, Faculty of Veterinary Medicine, Ss. Cyril and Methodius University, Skopje (Macedonia)
- Prof. Mitko Kotovchevski, PhD, Faculty of Philosophy, UKIM, Skopje (Macedonia)
- Prof. Milan Radosavljevic PhD, Dean, Faculty of strategic and operational management, Union University, Belgrade (Serbia)
- Prof. Marija Topuzovska-Latkovikj, PhD, Centre for Management and Human Resource Development, Institute for Sociological, Political and Juridical Research, Skopje (Macedonia)
- Prof. Marija Knezevic PhD, Academic, Banja Luka, (Bosnia and Herzegovina)
- Prof. Margarita Bogdanova PhD, D.A.Tsenov Academy of Economics, Svishtov (Bulgaria)
- Prof. Mahmut Chelik PhD, Faculty of Philology, University "Goce Delchev", Shtip (Macedonia)
- Prof. Marija Mandaric PhD, Faculty of Hotel Management and Tourism, University of Kragujevac, Vrnjacka Banja (Serbia)
- Prof. Marina Simin PhD, College of professional studies in Management and Business Communication, Sremski Karlovci (Serbia)
- Prof. Miladin Kalinic, College of professional studies in Management and Business Communication, Sremski Karlovci (Serbia)
- Prof. Mitre Stojanovski PhD, Faculty of Biotechnical sciences, Bitola (Macedonia)
- Prof. Miodrag Smelcerovic PhD, High Technological and Artistic Vocational School, Leskovac (Serbia)
- Prof. Nadka Kostadinova, Faculty of Economics, Trakia University, Stara Zagora (Bulgaria)
- Prof. Natalija Kirejenko PhD, Faculty For economic and Business, Institute of Entrepreneurial Activity, Minsk (Belarus)
- Prof. Nenad Taneski PhD, Military Academy "Mihailo Apostolski", Skopje (Macedonia)
- Prof. Nevenka Tatkovic PhD, Juraj Dobrila University of Pula, Pula (Croatia)
- Prof. Nedzad Korajlic PhD, Dean, Faculty of criminal justice and security, University of Sarajevo (Bosnia and Herzegovina)
- Prof. Nikolay Georgiev PhD, "Todor Kableshkov" University of Transport, Sofia (Bulgaria)
- Prof. Nikolina Ognenska PhD, Faculty of Music, SEU - Blagoevgrad (Bulgaria)
- Prof. Nishad M. Navaz PhD, Kingdom University (India)
- Prof. Oliver Iliev PhD , Faculty of Communication and IT, FON University, Skopje (Macedonia)
- Prof. Oliver Dimitrijevic PhD, High medicine school for professional studies "Hipokrat", Bujanovac (Serbia)
- Prof. Paul Sergius Koku, PhD, Florida State University, Florida (USA)
- Prof. Primoz Dolenc, PhD, Faculty of Management, Primorska University, Koper (Slovenia)
- Prof. Predrag Trajkovic PhD, JMPNT, Vranje (Serbia)
- Prof. Petar Kolev PhD, "Todor Kableshkov" University of Transport, Sofia (Bulgaria)
- Prof. Pere Tumbas PhD, Faculty of Economics, University of Novi Sad, Subotica (Serbia)

- Prof. Rade Ratkovic PhD, Faculty of Business and Tourism, Budva (Montenegro)
- Prof. Rositsa Chobanova PhD, University of Telecommunications and Posts, Sofia (Bulgaria)
- Prof. Rumen Valcovski PhD, Imunolab Sofia (Bulgaria)
- Prof. Rumen Stefanov PhD, Dean, Faculty of public health, Medical University of Plovdiv (Bulgaria)
- Prof. Sasho Korunoski, Rector, UKLO, Bitola (Macedonia)
- Prof. Sashko Plachkov PhD, Faculty of Pedagogy, University Neofit Rilski, Blagoevgrad
- (Bulgaria)
- Prof. Snezhana Lazarevic, PhD, College of Sports and Health, Belgrade (Serbia)
- Prof. Stojan Ivanov Ivanov PhD, Faculty of Public Health and Sport, SWU Neofit Rilski, Blagoevgrad (Bulgaria)
  Prof. Snezana Stoilova, PhD, High Medicine School, Bitola, (Macedonia)
- Prof. Stojna Ristevska PhD, High Medicine School, Bitola, (Macedonia)
- Prof. Suzana Pavlovic PhD, High health – sanitary school for professional studies, Belgrade (Serbia)
- Prof. Sandra Zivanovic, PhD, Faculty of Hotel Management and Tourism, University of Kragujevac, Vrnjacka Banja (Serbia)
- Prof. Shyqeri Kabashi, College "Biznesi", Prishtina (Kosovo)
- Prof. Trayan Popkochev PhD, Faculty of Pedagogy, South-West University Neofit Rilski, Blagoevgrad (Bulgaria)
- Prof. Todor Krystevich, Vice Rector, D.A. Tsenov Academy of Economics, Svishtov (Bulgaria)
- Prof. Todorka Atanasova, Faculty of Economics, Trakia University, Stara Zagora (Bulgaria)
- Doc. Tatyana Sobolieva PhD, State Higher Education Establishment Vadiym Getman Kiyev National Economic University, Kiyev (Ukraine)
- Prof. Tzako Pantaleev PhD, NBUniversity , Sofia (Bulgaria)
- Prof. Violeta Dimova PhD, Faculty of Philology, University "Goce Delchev", Shtip (Macedonia)
- Prof. Volodymyr Denysyuk, PhD, Dobrov Center for Scientific and Technologogical Potential and History studies at the National Academy of Sciences of Ukraine (Ukraine)
- Prof. Valentina Staneva PhD, "Todor Kableshkov" University of Transport, Sofia (Bulgaria)
- Prof. Vasil Zecev PhD, College of tourism, Blagoevgrad (Bulgaria)
- Prof. Venus Del Rosario PhD, Arab Open University (Philippines)
- Prof. Yuri Doroshenko PhD, Dean, Faculty of Economics and Management, Belgorod (Russian Federation)
- Prof. Zlatko Pejkovski, PhD, Faculty of Agricultural Sciences, UKIM, Skopje (Macedonia)
- Prof. Zivota Radosavljevik PhD, Dean, Faculty FORCUP, Union University, Belgrade (Serbia)
- Prof. Zorka Jugovic PhD, High health – sanitary school for professional studies, Belgrade (Serbia)

REVIEW PROCEDURE AND REVIEW BOARD

Each paper is reviewed by the editor and, if it is judged suitable for this publication, it is then sent to two referees for double blind peer review.

The editorial review board is consisted of 45 members, full professors in the fields 1) Natural and mathematical sciences, 2) Technical and technological sciences, 3) Medical sciences and Health, 4) Biotechnical sciences, 5) Social sciences, and 6) Humanities from all the Balkan countries and the region.

CONTENTS

ETYOLOGY OF CIRCULAR CARIES 829
Olga Kokoceva-Ivanovska 829
Efka Zabokova-Bilbilovska 829
Mijoska Aneta 829
BIOCOMPATIBILITY AND REACTION OF DENTAL POLYMERS IN ORAL ENVIRONMENT 835
Natasha Stavreva 835
Biljana Kapusevska 835
STUDY OF THE SIZE OF THE ANGLE OF THE MANDIBLE 841
Svetlana Jovevska 841
Mihajlo Petrovski 841
DENTAL SCANNERS IN PROSTHODONTICS 845
Blagoja Dashtevski 845
Aneta Mijoska 845
Marjan Petkov 845
Vanco Spirov 845
Oliver Dimitrovski 845
TEETH EXTRACTION WITH ROOT DELACERATION ON THE ORTHODONTIC INDICATIONS 853
Pavel Stanimirov 853
Greta Yordanova 853
DIFFERENCE IN CRANIOFACIAL CHARACTERISTICS IN ATTRACTIVE MALE AND FEMALE FACES 859
Sofija Carceva Shalja 859
Sandra Atanasova 859
Mihajlo Petrovski 859
ORAL TISSUE CONDITION IN PROSTHODONTIC GERIATRIC PATIENTS 865
Aneta Mijoska 865
Gordana Kovacevska 865
Georgi Tomov 865
INTRODUCTION TO ORTHODONTIC EDUCATION IN BULGARIA OF DIGITAL TECHNOLOGIES AND 3D ARCHIVING 869
Greta Yordanova 869
Martin Mladenov 869
INDICATIONS FOR MOLAR EXTRACTION DURING ORTHODONTIC TREATMENT 873
Sandra Atanasova 873
Sofija Carceva Salja 873
Ljubica Prosheva 873
COMPOSITE RESTORATIONS IN DENTISTRY 879
Aleksandar Andreevski 879
INFLUENCE OF GROWTH IN TREATED CLASS III GROWING PATIENTS WITH FACE MASK THERAPY AND UNTREATED PATIENTS 883
Sofija Carceva Shalja 883
Sandra Atanasova 883
POSITION OF THE MENTAL FORAMEN IN CORELATION WITH THE LOWER PREMOLARS: A PANORAMIC RADIOGRAPHIC STUDY 889
Mihajlo Petrovski 889
Svetlana Jovevska 889
Olivera Terzieva-Petrovska 889

PREVALENCE OF DENTAL CARIES IN CORRELATION WITH ORAL HYGIENE 895
Ivona Kovacevska 895
Natasha Longurova 895
Katerina Zlatanovska 895
THE SIGNIFICANCE OF TRAINING AND EDUCATION IN ACCURATE EVALUATION OF NATURAL TOOTH COLOR 901
Julija Zarkova 901
Ivan Nacevski 901
Vesna Korunovska Stefkovska 901
FUNCTIONAL RECOVERY OF VOICE FUNCTION IN PATIENTS WITH LARYNGEAL DYSFUNCTION: OBSERVATIONAL STUDY 905
Galina Mratskova 905
Damyan Petrov 905
THE INFLUENCE OF HYPERPROLACTINEMIA ON THE LEVEL OF FSH AND LH IN WOMEN 911
Mire Spasov 911
Verica Spasova 911
ACREDITED MOLECULAR METHODS FOR DETECTION OF INFECTIONS CAUSED BY HIV, HEPATITIS B VIRUS AND HEPATITIS C VIRUS 917
Belinda Gelmanovska 917
Vaso Taleski 917
FLUORESCENT IN SITU HYBRIDIZATION AND IMMUNOHISTOCHEMISTRY FOR SUBTYPING “NON-CLASSIFIABLE” RENAL CELL CARCINOMAS 921
Atanas Ivanov 921
Vili Stoyanova 921
JEJUNAL ADENOCARCINOMA: A CASE REPORT 925
Gordana Bozhinovska Beaka 925
Biljana Prgova Veljanovska 925
Milka Zdravkovska 925
Irena Eftimovska Rogac 925
Nadica Bozhinovska 925
THE ROLE OF TUMOR MARKERS CA 125, CA 72-4 AND CA 19-9 IN DETECTION AND MONITORING OF THE COURSE OF DISEASE OF OVARIAN CARCINOMA AND CARCINOMA OF THE UTERINE BODY 931
Kristina Petkova 931
Venci Chalkov 931
SPLENIC ABSCESS IN PATIENT WITH CHRONIC PANCREATITIS: A CASE REPORT 937
Gordana Bozhinovska Beaka 937
Biljana Noveska-Petrovska 937
Biljana Prgova Veljanovska 937
Nadica Bozhinovska 937
ROLE OF GOUT IN ATRIAL FIBRILLATION 943
Antoniya Kisheva 943
DEVELOPMENT ROLE AND IMPORTANCE OF FETAL AUTOPSY SCIENTIFIC PURPOSES - REVIEW OF THE LITERATURE 947
Tanya Kitova 947
BARRIERS TO THE EFFECTIVENESS OF DISEASE MANAGEMENT IN PEOPLE WITH DIABETES MELLITUS 953
Boryana Levterova 953

DYABETTE CONTROL PROGRAM AND PREVENTION OF THEIR CONDITIONS - PROPOSALS AND GUIDELINES 959
Varvara Pancheva 959
Valentin Vassilev 959
ALGORITHM OF COMPLEX PROGRAM FOR TREATMENT AND REHABILITATION IN DEGENERATIVE DISEASES OF THE VERTEBRAL COLUMN IN THE CERVICAL AREA. PREVENTION OF CERVICAL ARTHROPATHY 963
Petya Kasnakova 963
THE DIAGNOSIS OF DAUCUS CAROTA AS ALERGOGEN ON THE IMMUNE SYSTEM IN WHITE LABORATORY RAT 969
Mire Spasov 969
Icko Gjorgoski 969
THE DIAGNOSIS OF PHLEUM PRATENSE AS ALERGOGEN ON THE IMMUNE SYSTEM IN WHITE LABORATORY RAT 975
Hristijan Spasov 975
Mire Spasov 975
Icko Gjorgoski 975
Majlinda Ademi 975
INCREASED MEASLES MORBIDITY AND PUBLIC AWARENESS OF THE RISKS OF REFUSING IMMUNIZATION FOR THIS DISEASE 981
Ivelina Dobreva 981
Pavlina Teneva 981
Tsvetana Bojkova 981
PERSPECTIVES IN HEALTH CARE FOR CHILDREN WITH SPECIAL NEEDS IN CHILDREN'S AND SCHOOL HEALTH 985
Monika Obreykova 985
Galina Terzieva 985
MYOPIA IN PRE-SCHOOL CHILDREN AND MOBILE PHONES 991
Aleksandar Dodevski 991
Strahil Gazepov 991
Biljana Dodevska 991
Alen Georgijev 991
VISUAL SCREENING OF SCHOOL CHILDREN IN THE MUNICIPALITY OF SAPAREVA BANYA IN SOUTHWESTERN BULGARIA 995
Slavena Stoykova 995
Ekaterina Petrova 995
WETTABILITY – ANOTHER PARAMETER FOR GOOD FITTING OF A SILICONE-HYDROGEL DAILY DISPOSABLE CONTACT LENS 1001
Nikola Peev 1001
SUCCESSFUL COGNITIVE AGING - COGNITIVE RESERVE AND NEUROPLASTICITY 1005
Antonia Yaneva 1005
Kristina Kilova 1005
Teodora Dimcheva 1005
THE ROLE OF ACUPUNCTURE IN THE REHABILITATION OF PARALYSIS OF N.FACIALIS 1009
Lence Nikolovska 1009
Stefanija Gjorgieva 1009
Mire Spasov 1009

NEED FOR TRAINING OF HEALTHCARE PROFESSIONALS FROM OUTPATIENT CARE FOR BURNS INJURIES 1013
Anushka Dimitrova 1013
CARE AND TREATMENT IN PATIENTS WITH HEPATITIS B IN THE MUNICIPALITY OF PRILEP 1019
Panova Gordana 1019
Boshevska Viktorija 1019
Liljana Simonovska 1019
Iva Paneva 1019
Lenche Nikolovska 1019
Mire Spasov 1019
Gjorgji Shumanov 1019
ACUTE VENLAFAXINE OVERDOSE WITH POSITIVE URINE IMMUNOASSAY FOR TRAMADOL – CLINICAL AND DIAGNOSTIC OVERLAP - CASE REPORT AND LITERATURE OVERVIEW 1027
Pereska Zanina 1027
Janicevic-Ivanovska Danijela 1027
Bekjarovski Niko 1027
Simonovska Natasha 1027
Babulovska Aleksandra 1027
DRUG-INDUCED NEUTRALIZING ANTIBODIES TO TNF-α BLOCKES IN PATIENTS WITH INFLAMMATORY JOINT DISEASES FOLLOWED BY 24-MONTHS 1033
Krassimir Kraev 1033
Mariela Geneva-Popova 1033
Velichka Popova 1033
Stanislava Popova 1033
INFORMATION AND KNOWLEDGE OF THE ANTIBIOTICS AND THE ANTIBIOTIC RESIDENCE OF THE POPULATION FROM THE SOUTHEAST REGION OF REPUBLIC OF NORTH MACEDONIA 1039
Milka Zdravkovska 1039
Marija Darkovska-Serafimovska 1039
Gordana Bozinovska-Beaka 1039
Svetlana Zivkova 1039
SIMPLE LIQUID CHROMATOGRAPHY METHOD WITH UV DETECTION FOR DETERMINATION OF BROMAZEPAM IN SOLID PHARMACEUTICAL DOSAGE FORMS 1045
Irena Brcina 1045
Marija Darkovska Serafimovska 1045
Tijana Serafimovska 1045
Trajan Balkanov 1045
Biljana Gjorgjeska 1045
CONSUMPTION ANALYSIS OF MOST PRESCRIBED ANTIBIOTICS FINANCED BY THE HEALTH INSURANCE FUND IN REPUBLIC OF NORTH MACEDONIA 1051
Elena Drakalska 1051
Bistra Angelovska 1051
Veneta Zdravkova 1051
MICROBIOLOGICAL DIAGNOSIS AND IMPORTANCE OF INFECTIONS CAUSED BY INFLENZAE – A VIRUS 1057
Zivadinka Cvetanovska 1057
Vaso Taleski 1057

POISONOUS SNAKES OF BULGARIA: CLINICAL AND EPIDEMIOLOGICAL ANALYSIS 1063
Olimpiada Atmazhova 1063
Evgenia Barzashka 1063
Iskra Petkova 1063
BODY FAT DISTRIBUTION AND LIPID PROFILE CHANGES AFTER WEIGHT LOSS – A CASE REPORT 1071
Slavica Shubeska Stratrova 1071
Danijela Janicevic Ivanovska 1071
FACTORS FOR OBESITY IN STUDENTS FROM THE SCHOOLS 1077
Antoaneta Grozeva 1077
INFLUENCE OF SUNSHINE ON THE SERUM LEVELS OF VITAMIN D 1081
Ivelina Dobreva 1081
Pavlina Teneva 1081
Valya Trencheva 1081
GEOMEDICAL TOURISM – OUTDOOR HEALTH CARE FACILITIES ANTI-GEOPATHIC STRESS TREATMENT 1087
Krasimira Staneva 1087
APPLICATION OF BLASTWARE SOFTWARE FOR MEASURING MICROCOLIMIC CONDITIONS 1093
Naim Baftiu 1093
Raif Bytyqi 1093
Overall, the number of measurements 1096
Percentage 1096
APPLICATION OF BIOPRINTING IN CONTEMPORARY MEDICINE (REVIEW) 1099
Desislava Bakova 1099
Kristina Kilova 1099
Maria Semerdjieva 1099
CBRN EVENT - DO WE NEED MEDICAL INTELLIGENCE 1103
Elena Valkanova 1103
Rostislav Kostadinov 1103
ACUTE PANCREATITIS 1107
Redzep Emurlai 1107
PALLIATIVE CARE AND EUTHANASIA – CONVERGENCE POINTS AND PUBLIC ATTITUDES 1113
Nikola Sabev 1113
SOCIOECONOMIC CHARACTERISTICS OF PATIENTS WITH TENSION HEADACHE IN MUNICIPALITY OF VELES 1119
Elena Manchevska 1119
Toshe Krstev 1119
Gordana Panova 1119
SEASONALITY IN THE APPEARANCE OF INTRA HOSPITAL INFECTIONS 1127
Emilija Chapevska 1127
PEDAGOGICAL COMPETENCE OF MENTORS DURING THE PRE-GRADUATION TRAINEESHIP OF FUTURE NURSES 1131
Snezhana Dragusheva 1131
Penka Petleshkova 1131
Tanya Paskaleva 1131

KNOWLEDGE – International Journal
Vol.31.4
June, 2019

BODY FAT DISTRIBUTION AND LIPID PROFILE CHANGES AFTER WEIGHT LOSS – A CASE REPORT

Slavica Shubeska Stratrova
Clinic of endocrinology, diabetes and metabolic disorders, slavass02@yahoo.com, Skopje, North Macedonia
Danijela Janicevic Ivanovska
University clinic of Clinical biochemistry, Skopje, Faculty of Medical Sciences, University Goce Delchev, Shtip, North Macedonia, djanicevic@yahoo.com,

Abstract: The aim of this study was to discover the relationship between body fat distribution and lipid profile changes after weight loss. In this case report following subject's parameters were determined before and after weight loss of 12 kg: body mass index (BMI), body weight (BW), total, trunk and legs fat mass (FM) with dual energy x-ray absorptiometry (DXA) and their ratios legs/trunk and legs/total FM indexes of abdominal fat distribution. Lipid profile was also determined before and after weight loss: total cholesterol (TC), triglycerides (TG), HDL-C, LDL-C, LDL/HDL-C, TC/HDL-C. BW of 63 kg and BMI value of 28.74 kg/m^2 before the weight loss lowered to 51kg and 22.55 kg/m^2. The percentage difference between the change in BMI and BW was statistically not significant ($p=0.782$). Legs/total FM index value increase from 0.36 to 0.39 was significant ($p<0.025$). Legs/trunk FM index value increase from 0.67 to 0.76 was also significant ($p<0.043$). Legs, total and trunk FM had not significant reduction ($p>0.05$), but the percentage difference between their changes, during weight reduction was statistically significant ($p=0.0001$). TC, HDL-C, LDL-C, LDL/HDL-C, TC/HDL-C changes were also significant. The percentage difference between the change in BMI and BW to normal levels was statistically not significant, but the percentage difference between the changes in DXA indexes of visceral, abdominal obesity was significant and it was associated with significant reduction of atherogenic lipid profile indicating reduced atherogenic risk. These results confirmed that DXA measurements of abdominal fat distribution are very useful in studies related to obesity-associated disease risk.
Keywords: dual-energy x-ray absorptiometry, obesity, weight loss, lipids.

INTRODUCTION

The core abnormality of Metabolic Syndrome is the increased body weight, and particularly central, abdominal obesity as well as dyslipidemia. The TC/HDL-C ratio, known as the atherogenic or Castelli index and the LDL/HDL cholesterol ratio are two important components and indicators of cardiovascular risk, the predictive value of which is greater than the isolated parameters. Obesity and central body fat distribution are known risk factors for cardiovascular and metabolic diseases. Android obesity, which is predominantly visceral, intra-abdominal, is more predictive of adipose-related comorbidities than gynecoid obesity, which has a relatively peripheral (gluteal) distribution. Excess abdominal fat is an important, independent risk factor for disease.

Dual-energy x-ray absorptiometry enabled precise, accurate body composition and body fat distribution assessment and showed that BMI increase was associated with more pronounced abdominal obesity, indicating substantially higher risk for development of metabolic and cardiovascular complications of the hyperinsulinemic-dyslipidemic syndrome [1]. The assessment of abdominal fat accumulation especially in postmenopausal (postM) women is an important screening tool for the prevention of these health complications [2]. DXA measurements of fat distribution are very useful in studies related to obesity-associated disease risk. DXA is an excellent method to measure and monitor body composition changes in obese patients undergoing weight loss. DXA can precisely monitor how much fat was lost during weight loss. Some relationship ratios between central (android, abdominal) regional tissue and FM to peripheral gynoid regional parts of the body in patients with Cushing's syndrome (CS) were discovered as diagnostic criteria of visceral, abdominal obesity in patients with CS and non CS, and they are needed as diagnostic DXA indexes of central obesity [3,4]. DXA indexes of central, abdominal obesity legs/trunk FM and legs/total FM ratios discovered extreme central body fat distribution in CS, differentiated them significantly from healthy control women and obese with the same BMI, and are discovered DXA indexes of abdominal, central obesity that should be used as DXA indexes of extreme central (visceral, abdominal) obesity in CS and non CS obese women. They are indicators of abdominal obesity [4,5].

The aim of this case report was to investigate body composition and body fat distribution changes with DXA indexes of central, abdominal obesity, legs/trunk FM (L/Tr FM) and legs/total FM (L/To FM) as well as lipid values

and atherogenic indexes and their changes after weight loss with consequent normal BMI. It was important do discover weight loss influence on body fat distribution, lipid metabolism and atehrogenic risk.

MATERIALS AND METHODS

Author's personal BMI and BW reduction were determined before and after weight loss of 12 kg as well as the changes of the DXA indexes of abdominal obesity L/To FM and legs/trunk L/Tr FM and lipid profile. Examined subject was postmenopausal (postMP).

Table1. BMI and BW values before and after weight loss, and percentage of their change

	Before weight lost	After weight lost	% of change	P
BMI (kg/m2)	28.74	22.55	21.54	0.077
Body weight (kg)	63	51	19.05	0.067

The percentage difference between the change in BMI and BW, was statistically not significant
Difference test: Difference 2,49% [(-13,41-21,90) CI 95%]; Chi-square=0,077; df=1 p=0,782.

Body height was measured by a wall stadiometer in barefoot subjects with head in a horizontal Frankfurt plane to the nearest 0.1 cm. BW was measured by a digital scale while wearing light clothing and it was estimated in kilograms (kg). BMI was calculated with the following formula: weight (kg)/height (m^2). DXA assessment was performed with DXA System Lunar DPX-NT, which uses encore 10.x Windows-XP Professional OS computers. The entire body of the subject was scanned. During DXA scan, the subject was in a supine position while the x-ray scanner performed a series of transverse scans, measured at 1-cm intervals from the top of the head to the bottom of the toes. The DXA machine was calibrated daily in accordance with the manufacturer's guidelines to ensure adequate quality control. The system enabled simultaneous assessment of total and regional body composition and body fat distribution. Total (To), trunk (Tr) as well as legs (L) fat mass were determined and their ratios L/Tr, L/To [4]. Total cholesterol (TC), triglycerides (TG), high density lipoprotein cholesterol (HDL-C), low density lipoprotein cholesterol (LDL-C), LDL/HDL-C, TC/HDL-C were also determined.
Statistical analyses were performed using the statistical software program SPSS for Windows, version 19. Differences between the examined values before and after weight loss were tested by One-Sample T Test. P values <0.05 were considered to be statistically significant. Difference test, the percentage difference between the change of the examined values was determined with MedCalc statistical software.

RESULTS

Table 2. L/To, L and To FM before and after weight loss and percentage of their change

	Before weight lost	After weight lost	% of change	P
Legs/Total index	0.36	0.39	7.69	0.025
Legs FM (kg)	9.89	5.78	41.6	0.164
Total FM (kg)	27.89	14.96	46.33	0.186

The percentage difference between the change in L FM and To FM, was statistically significant.
(Difference test: Difference 4,73% [(3,47-5,98) CI 95%]; Chi-square=53,981; df=1 p=0,0001) in favor of To FM.

Table 3. L/Tr index, L and Tr FM before and after weight loss and percentage of their change

	Before weight lost	After weight lost	% of change	P
Legs/Trunk index	0.67	0.76	11.84	0.043
Legs FM (kg)	9.89	5.78	41.6	0.164
Trunk FM (kg)	14.88	7.59	48.94	0.199

The percentage difference between the change in L FM and Tr FM, was statistically significant.
(Difference test: Difference 7,34% [(6,08-8,59) CI 95%]; Chi-square=128,921; df=1 p=0,0001) in favor of Tr FM.

Table 4. Lipid levels before and after weight loss and percentage of their change

Fat mass	Before weight lost	After weight lost	% of change	P
Triglycerides	1.2	0.83	30.83	0.12
Total Cholesterol	6.5	5.65	13.08	0.044
HDL cholesterol	1.65	1.63	1.21	0.04
LDL cholesterol	4.3	3.61	16.05	0.05
LDL-C/HDL-C	2.61	2.21	15.32	0.05
TC/HDL-C	3.94	3.47	11.93	0.04

C- cholesterol; HDL - high density lipoprotein; LDL - low density lipoprotein

DISCUSSION

Obesity is a medical condition in which excess body fat has accumulated to an extent that it may have a negative effect on health [6]. Obese subjects have higher percentage of FM from the total body mass compared to non obese [7]. Central obesity can be an early warning sign of a condition called metabolic syndrome. People with metabolic syndrome have elevated blood pressure, high triglycerides, low levels of HDL cholesterol and insulin resistance. This combination of factors creates an especially high risk for stroke, coronary artery disease, cardiovascular disease-related mortality and type 2 diabetes. DXA measurements of fat distribution may be useful in studies related to obesity-associated disease risk [8]. Excess body fat in the abdominal region is referred to as android obesity, and it is associated with increased risk for cardiovascular disease. There is a growing evidence that intra-abdominal adipose tissue (IAAT), rather than total body fat, is a risk factor for metabolic conditions associated with obesity. For this reason the evaluation of IAAT is clinically important [9]. In a previous study, in 2011 Shubeska S. [1] discovered with DXA that BMI increase in healthy women was associated with a more pronounced abdominal fat distribution [8]. Because of that, effective methods for assessing visceral fat are important to investigate its role for the increased health risks in obesity [7]. There is an increased interest in the evaluation of various methods for assessment of body composition and fat distribution [10]. DXA body composition and fat distribution assessment may be useful in studies related to obesity-associated risks [11, 12].

Menopause is a high-risk time for weight gain. PostMP women have significantly more fat, a more central fat distribution, and less lean tissue mass than premenopausal (preMP) women [13]. Menopause-related central body fat accumulation potentially contributes to the increased incidence of disease observed in postMP, compared with preMP women [14, 15]. The subject of this case report is 60yr old postMP woman [1].

DXA is fast becoming the new "gold" standard" because it provides a higher degree of precision in only one measurement and has the ability to show exactly where fat is distributed throughout the body. It is very reliable and its results extremely repeatable; in addition, the method is safe and presents little burden to the subject. DXA method determines absolute (kg) and relative (%) total, bone, lean and fat body mass and separately their regional values on arms, legs, head and trunk (including ribs, pelvis, thoracic and lumbar spine). Body composition, including fat mass, body fat distribution and muscle mass, gradually change with aging, even if the body weight and BMI remain unchanged. LBM decreases significantly, while fat mass increases and is preferentially stored in abdominal tissues [16,17,18]. Trunk FM increase is a result of dominant android, abdominal FM increase indicating increased risk for metabolic complications [1]. Body fat distribution is simply determined with DXA by the relationship of the regional (segmental) fat compartments. The relationship of the predominantly central, android, abdominal FM and tissue mass (TM) and the gynoid (peripheral FM and TM) is an indicator of the central, abdominal obesity [3].

It was found that low weight, independent of menopausal status, leads to the typical gynoid pattern of fat distribution while excess weight and obesity result in an android pattern of distribution in pre- and postMP women [11]. By measuring body composition, a person's health status can be more accurately assessed and the effects of both dietary and physical activity programs better directed. Total body analysis with DXA is the ideal way for the serious athlete, the person monitoring or beginning a program of exercise or weight loss, or anyone curious or concerned about their health to receive a quick, painless, accurate and confidential assessment of their body's composition. Also, measurements of body composition and body fat distribution with DXA have provided a research tool to study the metabolic effects of aging, obesity, and various wasting conditions. Because a scale measures "body weight," which includes fat, muscles, bones and organs, it can't specifically tell how much fat had

been lost, and the only way to measure actual fat loss is to measure "body composition," not body weight in weight loss programs [19,20]. DXA can precisely monitor how much fat is lost during weight loss.

Changes in body composition during weight loss programs might have a significant effect on long-term results and sensitive DXA indexes of visceral central obesity are needed, because of lack of normal reference data, which is an issue that is currently being addressed.

CS patients are discovered gold standard of extreme central, visceral, abdominal body fat distribution. DXA indexes of central body fat distribution in Cushing's (CS) also could be used as a gold standard for abdominal obesity in non CS. They were discovered as diagnostic criterion of extreme central, visceral obesity in CS and obese controls (CO) with the same BMI as CS (non CS). Shubeska-Stratrova S. (2015), showed that the ratios of insignificantly different central and peripheral regional parts of the body, precisely differentiated the patients with CS and non CS obese, and confirmed central body fat distribution in CS [2,21]. In that study it was found that legs/trunk FM ratios differentiated CS and CO with very high significance ($p<0.001$) and discovered extreme central body fat distribution in CS. DXA indexes legs/trunk FM, legs/total FM ratios discovered extreme central body fat distribution in CS, differentiated them significantly from C and CO, and could be used as DXA indexes of extreme central, abdominal obesity in CS and non CS obese women. DXA indexes of central body fat distribution in CS also could be a gold standard and diagnostic criterion of extreme central, visceral fat distribution in different types of obesity (non CS). Cut-off points of the following indexes confirmed extreme central, abdominal obesity: legs/trunk FM lower than 0.65 and legs/total FM indexes lower than 0.36 [2, 3].

In this case report subject's L/Tr FM ratio value was 0.67, but after the weight loss of 12 kg it increased significantly to normal value of 0.76 ($p<0.048$). L/To FM ratio value of 0.36 before the weight loss, increased significantly to its normal value of 0.39 ($p<0.025$) after the weight loss. The percentage difference between the change in L FM and To FM, was statistically significant in favor of To FM. The percentage difference between the change in L FM and Tr FM, was statistically significant in favor of Tr FM. Significant higher percentage of trunk FM reduction (48.94%) compared to legs FM reduction (41.6%) showed significant higher reduction of intra-abdominal, android FM mass indicating reduced risk for metabolic complications. Significant difference of L/Tr and L/To FM indexes compared to its value after weight reduction confirmed lowering of the android fat mass and significantly reduced risk for metabolic complications. Significant increase in these indexes of central obesity after the weight loss confirmed reduction of abdominal obesity and normalized body fat distribution.

An increase in total cholesterol concentration, and specifically LDL cholesterol (an atherogenic lipid marker), and reduced HDL cholesterol concentration are correlated with numerous risk factors, including the components of the metabolic syndrome, and probably involve independent risk [22, 23, 24]. Low-density lipoprotein (LDL) cholesterol concentration has been the prime index of cardiovascular disease risk and the main target for therapy.

In an attempt to optimize the predictive capacity of the lipid profile, several lipoprotein ratios or "atherogenic indices" have been defined. These ratios can provide information on risk factors difficult to quantify by routine analyses and could be a better mirror of the metabolic and clinical interactions between lipid fractions. Total/high-density lipoprotein (HDL) cholesterol and LDL/HDL cholesterol ratios are risk indicators with greater predictive value than isolated parameters used independently, particularly LDL. Total cholesterol/HDL ratio is considered a more sensitive and specific index of cardiovascular risk than total cholesterol [25, 26, 27, 28].

In this study lipid levels in the examined overweight subject also showed higher risk for development of metabolic complications. Higher LDL-C values reduced for 16.05% and total cholesterol reduced for 13.08% after the weight loss. LDL/HDL-C and TC/HDL-C significantly lowered after weight lost and BMI normalization. Atherogenic indexes reduced significantly, LDL/HDL-C ($p<0.05$) and TC/HDL-C ($p<0.04$). BMI and BW reduction to normal levels was associated with significant increase of indexes of central body fat distribution legs/total and legs/trunk FM to normal values as well as significant reduction of atherogenic lipid indexes indicating reduced atherogenic risk.

CONCLUSION

Legs/total and legs/trunk fat mass values before the weight loss confirmed abdominal obesity with dyslipidemic profile and higher cardiovascular risk in a DXA examined overweight subject. BMI, BW, legs/total and legs/trunk FM change to normal levels after the weight loss, confirmed reduced abdominal body fat distribution and consecutive normalized body composition and body fat distribution. This showed that body weight reduction in overweight subjects is important in order to improve body composition and minimize the cardiometabolic profile and risk. These results confirmed that DXA measurements of body composition and fat distribution are very useful in studies related to obesity-associated disease risk.

REFERENCES

Ascaso J, González Santos P, Hernández Mijares A, et al. Management of dyslipidemia in the metabolic syndrome. Recommendations of the Spanish HDL Forum. Am J Cardiovasc Drugs. 2007;7:39–58.

Bouchard C, Bray GA, Hubbard VS. Basic and clinical aspects of regional fat distribution. Am J Clin Nutr 1990; 52(5): 946-50.

Brownbill RA &Ilich JZ. Measuring body composition in overweight individuals by dual energy x-ray absorptiometry. BMC Medical Imaging 2005; 5:1doi:10.

Garaulet M, Pérez-Llamas F, Baraza JC, Garcia-Prieto MD, Fardy PS. Body fat distribution in pre-and post-menopausal women: metabolic and anthropometric variables. J Nutr Health Aging. 2002; 6(2):123-6.

Haarbo J, Gotfredsen A, Hassager C, Christiansen C. Validation of body composition by dual energy X-ray absorptiometry (DEXA). *Clin Physiol* 1991; 11(4):331-341.

Hendel HW, Gotfredsen A, Andersen T, *et al*. Body composition during weight loss in obese patients estimated by dual energy X-ray absorptiometry and by total body potassium. *Int J Obes Relat Metab Disord* 1996; 20(12):1111-1119.

Hong MK, Romm PA, Reagan K, Green CE, Rackley CE. Usefulness of the total cholesterol to high-density lipoprotein cholesterol ratio in predicting angiographic coronary artery disease in women. Am J Cardiol. 1991;68:1646–1650.

Jensen MD, Kanaley JA, Reed JE, Sheedy PF. Measurements of abdominal and visceral fat with computed tomography and dual-energy x-ray absorptiometry. Am J ClinNutr 1995; 61(2):274-8.

tomography. *Int J Obes Relat Metab Disord* 1993; 17(1):45-51.

Ingelsson E, Schaefer EJ, Contois JH, et al. Clinical utility of different lipid measures for prediction of coronary heart disease in men and women. JAMA. 2007;298:776–785.

Kamel EG, McNeill G, Han TS, Smith FW, Avenell A, Davidson L, Tothill P. Measurement of abdominal fat by magnetic resonance imaging, dual-energy X-ray absorptiometry and anthropometry in non-obese men and women. Int J Obes Relat Metab Disord. 1999; 23(7):686-92.

Kim JS, Yoo SM, Kim KN, Lee SY. Comparison of DEXA and CT for truncal obesity in adult women related to metabolic complications. J Korean Acad Fam Med. 2007 Sep; 28(9):675-681.

Kinosian B, Glick H, Garland G. Cholesterol and coronary heart disease: predicting risks by levels and ratios. Ann Intern Med. 1994;121:641–647.

Mounier-Vehier C, Stephan D, Aboyans V, et al. Groupe vasculaire (SFC-Societe francaise de medecine vasculaires. The best of vascular medicine in 2006. Arch Mal Coeur Vaiss. 2007;100:47–55.

Nam BH, Kannel WB, D'Agostino RB. Search for an optimal atherogenic lipid risk profile: from the Framingham Study. Am J Cardiol. 2006;97:372–375.

Natarajan S, Glick H, Criqui M, Horowitz D, Lipsitz SR, Kinosian B. Cholesterol measures to identify and treat individuals at risk for coronary heart disease. Am J Prev Med. 2003;25:50–57.

"Obesity and overweight Fact sheet N°311". WHO. January 2015. Retrieved 2 February 2016.

Shubeska Stratrova S. Densitometric to anthropometric indexes of visceral obesity relations. J Antropol Society Serbia. Novi Sad, 2011;46:49-58.

Shubeska Stratrova S. Dual-energy x-ray absorptiometry assessment of the body composition and body fat distribution in pre- and postmenopausal women. J Antropol Society Serbia. Novi Sad, 2010;45:199-206.

Shubeska Stratrova S, Snezana Markovik Temelkova, Goran Petrovski. Dual–energy X-ray absorptiometry (DXA) assessment of body composition and body fat distribution in Cushing's women. Mac. Med. Review, 2015; 69(2):86-93.

Shubeska Stratrova S, Todorovska L. Android/legs and legs/trunk indexes determined with dual-energy x-ray absorptiometry in Cushing's and non Cushing's obese women. Arch Pub Health 2017;9(2):18-25.

Shubeska Stratrova S., Todorovska L, Efremovska Lj, Gligorovska JP. Evaluation of central obesity in Cushing's and non Cushing's women with dual-energy x-ray absorptiometry. Physioacta 2017; 11(2):7-14.

Šubeska Startrova S. Dual-energy x-ray absorptiometry assessment of the body composition in obese women. J Anthropol Society Serbia. Novi Sad 2009, 44:455-461.

Šubeska Stratrova S, Dimitrovski C, Todorovska L, Stefanovska Balabanova G. Evaluation of the body composition in female Cushings. J of the Anthropol Society of Serbia. Novi Sad 2008, 43:440-447.

Snijder MB, Visser M, Dekker JM. The prediction of visceral fat by dual-energy X-ray absorptiometry in the elderly: a comparison with computed tomography and anthropometry. Int J Obes Relat Metab Disord. 2002; 26(7):984-93.

Svendsen OL, Hassager C, Christiansen C. Age- and menopause-associated variations in body composition and fat distribution in healthy women as measured by dual-energy X-ray absorptiometry. Metabolism. 1995; 44(3):369-73.

Svendsen OL, Hassager C, Bergmann I, Christiansen C. Measurement of abdominal and intra-abdominal fat in post menopausal women by dual energy X-ray absorptiometry and anthropometry: comparison with computerised

Toth MJ., Tchernof A., Sites CK, Poehlman ET. Menopause-related changes in body fat distribution. Ann N Y Acad Sci. 2000; 904:502-6.

Wallner SJ, Luschnigg N, Schnedl WJ, Lahousen T, Sudi K. Body fat distribution of overweight females with a history of weight cycling. Int J Obes Relat Metab Disord. 2004; 28(9):1143-8.