

## **STANDPOINT**

**by**

**Assoc. Prof. Dr. Mila Bogdanova Boyadzhieva, MD, PhD Endocrinologist, Second Department of Internal Medicine, Medical University "Prof. Dr. P. Stoyanov" - Varna and Clinic of Endocrinology, University Hospital "St. Marina", Varna. Appointed to prepare an opinion as a member of the scientific jury according to Order № P-109-585 / 17.12.2021 of the Rector of MU-Varna and on the basis of Protocol №1 / 20.12.2021.**

**of**

**the dissertation of Dr. Radina Stoyanova Dimitrova, on "Comparative characteristics of metabolic markers in assessment of postmenopausal bone health " for the award of educational and scientific degree "Doctor" in professional field 7.1 Medicine, in the scientific specialty "Endocrinology".**

**Scientific adviser: Prof. Dr. Kiril Hristozov, Ph.D.**

**Dr. Radina Stoyanova Dimitrova graduated in medicine in 2010 at MU-Varna, has a degree in endocrinology (2018), a professional qualification for ultrasound of the cervical region (2019) and fine-needle aspiration biopsy under ultrasound control of thyroid, parathyroid glands, lymph nodes and tumor formations in the cervical region (2019).**

**He started working at MHAT "Eurohospital", Varna (2010 - 2013), from 2011 to the present he works at MHAT "St. Marina" - Varna consecutively as a doctor in the emergency department for adults and a doctor in the Clinic of Endocrinology. Since 2016 he has been an assistant at the Second Department of Internal Medicine, Board of Endocrinology at MU-Varna. In the period 2018 - 2021 she was a full-time doctoral student at MU-Varna and University Hospital "St. Marina" - in the Clinic of Endocrinology.**

**Postmenopausal osteoporosis is widespread, and the associated increased fracture risk carries some of the most damaging effects during women's aging. Contradictory literature on the relationship between different aspects of metabolic syndrome and bone health calls for research to further elucidate the problem. In this sense, the selected topic of the dissertation is relevant.**

**The dissertation is developed in 174 standard typewritten pages and is illustrated with 22 tables and 84 figures. The content is appropriately structured and balanced in the individual parts and is presented by: literature review, purpose and tasks, own research (selection of participants and main methods, statistical methods, results), discussion, conclusions, contributions, conclusion, scientific publications and communications, applications and**

bibliography. The bibliography contains 421 titles, of which 6 in Cyrillic and 415 in Latin. The style is extremely good, clear, with a correct discussion of the data and conclusions.

The literature review determines the clinical importance of the problem, various aspects are discussed in detail, such as the definition and significance of osteoporosis, risk factors for its development. Emphasis is placed on the still controversial issue of the relationship between metabolic syndrome and bone health, namely the association between visceral adipose tissue and bone mineral density (BMD), bone strength and fracture risk, and the relationship between insulin resistance and bone. The hormonal and inflammatory changes that occur in obesity, the impact of various drugs on bone metabolism - statins, antihypertensives and others. Based on the modern literature and its critical analysis, the prerequisites for the present study are outlined.

The aim of the dissertation is precisely and clearly stated: " To establish a possible association between bone health in postmenopausal women and their metabolic profile by comparing certain metabolic parameters and inflammatory markers and to assess the relationship between metabolic syndrome and bone integrity and to assess the relationship between the metabolic syndrome and bone integrity. " The set 6 tasks are analytical and specific, which logically follow the goal.

The selection of the participants, the clinical, laboratory and instrumental methods, as well as the functional examination are described in detail. The selected statistical methods of analysis are appropriately selected and allow to process the data and to answer the set tasks.

The results of the study are clearly presented in nine sections - assessment of bone health, the relationship between age and menopausal age, anthropometric parameters, carbohydrate and lipid metabolism, inflammatory markers, blood pressure and antihypertensive therapy, coronary heart disease, as well as determining the risk profile for bone health in postmenopausal age. Each section contains additional subsections.

The results regarding the found positive dependence are valuable of serum phosphorus with BMD in the studied skeletal areas (for BMD  $r = 0.422$ ;  $p < 0.001$ ), independent of eGFR. Of interest is the found negative correlation between body weight (BT) and fracture risks, as well as the found positive relationship of DAN with both the 10-year risk of MOF ( $r = 0.252$ ;  $p = 0.021$ ) and the 10-year risk. risk for HF ( $r = 0.282$ ;  $p = 0.009$ ). Moreover, this dependence persists for both fracture risks after age, BW, BMI, and waist circumference.

I consider it extremely appropriate to analytically discuss the results after each section, which makes commenting on them in accordance with the data published so far in the world literature easier.

I agree with the contributions that Dr. Dimitrova correctly defines.

The abstract meets the requirements of the law for the development of academic staff.

I have no significant critical remarks.

In connection with the topic of the dissertation, the dissertation author has made 5 full-text publications in Bulgarian journals.

**Conclusion:**

The dissertation work of Dr. Radina Stoyanova Dimitrova presented to me for my opinion reflects in-depth work - precisely planned and conducted, as well as correctly and critically analyzed. Given the volume of work performed, the numerous results, their in-depth comparison with the data published so far, the contributions, as well as my personal impressions and discussions during the study, I believe that the dissertation work meets the criteria for educational and scientific degree " doctor of philosophy ". The presented publications meet the requirements.

All this, as well as the clinical benefits of scientific research, give me reason to suggest to the members of the scientific jury to vote positively for the award of the scientific degree "Doctor of philosophy" to Dr. Radina Stoyanova Dimitrova.

09.02.2022

Varna

  
assoc. prof. M.Boyadzhieva,MD,PhD