



STATEMENT

by Assoc. Prof. Dr. Antoaneta Rangelova Bozukova-Toncheva, PhD, Head of the Clinic of Internal Medicine at the National Medical Center "Tsar Boris III", Sofia

concerning

dissertation and abstract on the topic:

"Development of a specific national model for predicting osteoporotic fracture risk and assessment of bone mineral density of axial skeleton with radiofrequency echographic multi spectrometry (REMS)"

Presented for defense and award of scientific degree "Doctor of Science"

Professional field 7.1. Medicine, 7. Health

Scientific specialty Rheumatology

In the Department of Propaedeutics of Internal Medicine

Medical University - Plovdiv

Author: Dr. Elena Kirilova Kirilova, PhD - Assistant Professor of Internal Medicine at the Faculty of Health and Medicine and the Medical Faculty of the University "Prof. Dr. Asen Zlatarov" - Burgas, Rheumatology resident.

Relevance of the topic

Osteoporosis is a socially significant disease with a high frequency among the elderly population, leading to fractures, which impose health and economic problems. They are expected to increase by 22% over the next 30 years. In the presented dissertation the author considers two current aspects - national "FRAX" model for prediction of osteoporotic fracture risk and osteodensitometry of the axial skeleton with an innovative ultrasound technique. The presented national "FRAX" model has a significant application in the practice, as on its basis the fracture risk in each Bulgarian can be assessed by comparing the data entered by him with the data on the

Bulgarian population. So far, the fracture risk among the Bulgarian population is assessed by comparison with other nationalities. An innovative ultrasound technique for estimating the bone mineral density of the axial skeleton, called "Radiofrequency echographic multi spectrometry (REM)" is considered. For the first time in Bulgaria data from patients examined with REMS are presented. The author also creates specific models for predicting the T-score <-1 standard deviations (SD) of the lumbar spine and for predicting fracture risk "FRAX" $\geq 20\%$ by REMS. The obtained models have an important application in everyday practice.

Structure

The statement is made on the basis of a dissertation presented in a volume of 225 standard pages and is illustrated with 8 tables, 27 figures and 14 appendices. It is structured according to the rules for preparing a dissertation and is balanced as a ratio between the individual sections. The results are additionally illustrated in the text with informative figures and tables. The author uses a wide range of statistical methods to fulfill the purpose of her research. Statistically significant results are well discussed in the dissertation and in the abstract.

Knowledge of the problem

The literary review reflects the current state of the problem in the world and in our country and shows the excellent literary awareness of Dr. Kirilova. 478 scientific sources were used, of which 8 are in Cyrillic and the remaining 470 - in Latin. The material shows the excellent abilities of the doctoral candidate to analyze and summarize the literature data.

The aim of the dissertation is formulated precisely and clearly. The specific material is used to direct the research to the practical aspects of the problem. 11 tasks for servicing the set goal are very well defined.

Research methodology

The frequency of femoral fractures in Stara Zagora region within the period between 2015-2017 was studied, and osteodensitometry of the axial skeleton was performed in 324 women with the innovative REMS technology. The applied scientific methods are presented in detail. The statistical processing of the results allows reaching reasonable conclusions about the studied parameters.

Characteristics and evaluation of the dissertation and contributions

The dissertation of Dr. Elena Kirilova is dedicated to the development of a current topic with important practical application, using an appropriate methodology, including an innovative one. The obtained results correspond to the set goal. From the conducted large-scale studies, 11 conclusions were formulated briefly and clearly, which correspond to the presented results. I accept the formulated 9 contributions of the dissertation. I consider that Dr. Elena Kirilova did an excellent job in the realization of her work.

Conclusion

The topic "*Development of a specific national model for predicting osteoporotic fracture risk and assessment of bone mineral density of axial skeleton with radiofrequency echographic multi spectrometry (REMS)*" fully meets the requirements of the Academic Staff Development Act in the Republic of Bulgaria. This is a topical, very well planned and impressively realized scientific work. Due to the above, I fully believe my positive assessment of the dissertation and propose to the esteemed scientific jury to award Dr. Elena Kirilova Kirilova the degree "Doctor of Science" in Rheumatology in the professional field of Medicine.

Date 15.05.2021

Assoc. Prof. Antoaneta Toncheva, PhD

