Огляди літератури, оригінальні дослідження, ***погляд на проблему, короткі повідомлення***
УДК 616-072.7:616-056.2:614.254.3
DOI 10.11603/1811-2471.2017.v0.i2.7733

BIOELECTRICAL IMPEDANCE METHOD OF BODY COMPOSITION ASSESSMENT IN ALGORITHM AND TECHNOLOGIES OF HEALTHY LIFESTYLES IMPLEMENTATION FOR PREVENTION AND CONTROL OF NONCOMMUNICABLE DISEASES IN THE FAMILY PHYSICIAN PRACTICE

©M. Potjagenko[1], A. Nevoit[1], N. Sokoluk[1], M. Nevoit[2], L. Ozarchuk[2]

[1]Educational and Scientific Institute of Postdegree Education of the Higher State Educational Establishment of Ukraine «Ukrainian Medical Stomatological Academy"
[2]City Clinical Hospital № 2, Poltava, Ukraine

SUMMARY. The medical public understands the importance of the prevention and control of Noncommunicable Diseases (NCD) today. In the present study we aimed to evaluate the sensitivity of the Bioelectrical Impedance Method of body composition assessment, and to improve an algorithm in technologies of healthy lifestyles implementation for prevention and control of NCD in the family physician practice. 59 doctors-interns took part in the assessment of the body composition (middle age=24±2 years; 47(79.6 %) were women) on the Body Composition Monitor (HBF-500-E Omron, Japan). 25 % and 19 (33 %) of participants had BMI ≥ 25 kg/m^2 and increased level of total body fat. 56 (95 %) doctors-interns had the level of muscles below the age norm. Data analysis showed that young doctors do not lead healthy lifestyles and that the Bioelectrical Impedance Method of body composition assessment is clinically acceptable for early diagnostics.

KEY WORDS: Bioelectrical Impedance Method; body composition; Noncommunicable Diseases.

Introduction. Noncommunicable Diseases (NCD) are one of the major health and development challenges of the 21st century. The 4 main types of NCD are cardiovascular diseases, cancers, chronic respiratory diseases and diabetes. They kill 38 million people each year. Sixteen million NCD deaths occur before the age of 70; 82 % of these "premature" deaths occurred in low- and middle-income countries. World Health Organization (WHO) Global action plan for the prevention and control of NCD 2013-2020 is the main mechanism to reduce the avoidable NCD. This plan aims to reduce the number of premature deaths from NCD by 25 % by 2025 through nine voluntary global nine targets. The targets focus in part by addressing factors of Healthy Lifestyles [1]. It causes relevance of questions of improvement of introduction of Healthy Lifestyles in Ukraine. Therefore we perform scientific research work "Development of Algorithms and Technology of Implementation of Healthy Lifestyles at Patients with the NCD on the Basis of Studying of the Psychoemotional Status" (number of the state filing 0116U007798).

Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health. Halt the rise in obesity is Target 7 of the WHO Global action plan for the prevention and control of NCD 2013-2020. Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults. Raised BMI is a major risk factor for NCD such as: cardiovascular diseases, which were the leading cause of death in 2012; diabetes; musculoskeletal disorders; some cancers. But results of the isolated research of the BMI are correct not always in the family physician practice. The anthropometric analysis of parameters the volume of the waist and the waist-to-hip ratio does not give information on incipient state in the absence of the expressed clinical manifestations. The body composition in parameters of a fat/muscle is an objective index of a physical and metabolic condition. Its changes are an early predictor of the NCD [1]. Therefore the Bioelectrical Impedance Method of body composition assessment has to take root into practical activities in the family physician practice widely.

The aim of the study. To estimate sensitivity of the Bioelectrical Impedance Method of body composition assessment, and to improve an algorithm in technologies on Healthy Lifestyles implementation for prevention and control of NCD in the family physician practice.

Materials and Methods. Fifty nine young-aged conditionally healthy doctors-interns were examined. Their middle age was 24±2 years. 47 (79.6 %) were women. We used the Body Composition Monitor (HBF-500-E Omron, Japan) in the research. Its principal specifications give the chance to determine: 1) Body Weight: 0 to 330 lb with 0.2 lb increments (0 to 150 kg with 0.1 kg increments); 2) Body fat percentage: 5.0 to 60.0 % with 0.1 % increments; 3) Skeletal muscle percentage: 5.0 to 50.0 % with 0.1 % increments; 4) BMI: 7.0 to 90.0 with 0.1 increments; 5) Resting metabolism: 385 to 3999 kcal with 1 kcal increments; 6) Visceral fat level: 30 levels with 1 level increments; 7) BMI classification: – (Underweight) / 0 (Normal) / + (Overweight) / ++ (Obese) with 12 levels of Bar display; 8) Body fat

percentage and Skeletal muscle percentage classification: – (Low) / 0 (Normal) / + (High) / ++ (Very High) with 12 levels of Bar display; 9) Visceral fat classification: 0 (Normal) / + (High) / ++ (Very High) with 9 levels of Bar display. The age range for the skeletal muscle percentage, resting metabolism, body age and visceral fat level is 18 to 80 years old. The age range for the body fat percentage classification is 20 to 79 years old. The Monitor HBF-500-E Omron estimates the body fat percentage by the Bioelectrical Impedance Method. It sends an extremely weak electrical current of 50 kHz and less than 500 μA through body to determine the amount of water in each tissue. [2]. All the rules of preparation and technology of measurement were observed.

Results and Discussion. 15 (25 %) of participants had BMI ≥ 25 kg/m^2. 3(5 %) of participants had BMI < 18,5 kg/m^2. The total body fat was increased at 19 (33 %) people. At 3 (5 %) of their visceral obesity was taped: 3 participants had 10 levels of Bar display, 1 participant had 10 level. They were predictors of risk factors of developing of Noncommunicable Diseases. We found lesser mass of skeletal at 56 (95 %) doctors-interns. Women had level of muscles 29.1±0.2 % at age norm 34–39 % ($p<0.05$). Men had level of muscles 34.2±0.2 % at age norm 42–54 % ($p<0.05$). Data analysis showed that doctors do not lead healthy lifestyles. Their level of physical activity is not satisfactory.

Conclusions. We can conclude that the Bioelectrical Impedance Method of body composition assessment is clinically acceptable and is a valid alternative to cutaneous folds as a method of assessing healthy lifestyles of the patient. Early diagnostics of cardiometabolic risk will be accessible in the Family Physician Practice.

LITERATURE

1. Global action plan for the prevention and control of noncommunicable diseases 2013–2020 [Electronic resource]. – Geneva : World Health Organization, 2013. – URL: http://apps.who. nt/iris/bits tream/10665/94384/1/9789241506236_ eng.pdf?ua=1, accessed 3 November 2014.

2. Instruction Manual Body Composition Monitor HBF-500-E Omron. –Omron Healthcare, INC, 2008. – 44 p.

3. Global action plan for the prevention and control of noncommunicable diseases 2013–2020. Geneva: World Health Organization, (2013). URL: http://apps.who. int/ iris/bitstream/10665/94384/1/9789241506236_ eng. pdf?ua=1, accessed 3 November 2014.

4. Instruction Manual Body Composition Monitor HBF-500-E Omron. (2008). Omron Healthcare, INC, 44.

REFERENCES

1. Global action plan for the prevention and control of noncommunicable diseases 2013–2020 (2013). Geneva: World Health Organization. Retrieved from: URL: http://apps.who. nt/iris/bitstream/10665/94384/1/9789241506236_ eng. pdf?ua=1, accessed 3 November 2014.

2. Instruction Manual Body Composition Monitor HBF-500-E Omron. –Omron Healthcare. (2008). INC.

3. Global action plan for the prevention and control of noncommunicable diseases 2013–2020. (2013). Geneva: World Health Organization Retrieved from: URL: http://apps. who. int/iris/bitstream/10665/94384/1/9789241506236_ eng.pdf?ua=1, accessed 3 November 2014.

4. Instruction Manual Body Composition Monitor HBF-500-E Omron. (2008). Omron Healthcare. INC.

БІОІМПЕНДАНСНИЙ МЕТОД ОЦІНКИ СКЛАДУ ТІЛА В АЛГОРИТМІ І ТЕХНОЛОГІЯХ ЗАПРОВАДЖЕННЯ ЗДОРОВОГО СПОСОБУ ЖИТТЯ ДЛЯ ПРОФІЛАКТИКИ І КОНТРОЛЮВАННЯ НЕІНФЕКЦІЙНИХ ЗАХВОРЮВАНЬ У ПРАКТИЦІ СІМЕЙНОГО ЛІКАРЯ

©М. М. Потяженко[1], Г. В. Невойт[1], Н. Л. Соколюк[1], М. М. Невойт[2], Л. П. Озарчук[2]

[1]ННІ післядипломної освіти ВДНЗУ «УМСА»
[2]2-га міська клінічна лікарня, м. Полтава

РЕЗЮМЕ. Сьогодні медичній спільноті зрозумілі важливість профілактики та контролю над неінфекційними захворюваннями. В дослідженні нами зроблена спроба визначення чутливості біоімпендансного методу оцінки складу тіла для оптимізації алгоритму запровадження здорового способу життя задля профілактики неінфекційних захворювань в практиці сімейного лікаря. На моніторі складу тіла (HBF-500-E Omron, Японія) обстежено 59 лікарів-інтернів (середній вік (24±2) роки; 47 (79,6 %) – жінки). У 25 % і 19 (33 %) респондентів встановлено збільшення індексу маси тіла ≥25 кг/м^2 та вмісту жиру відповідно. У 56 (95 %) – встановлено зниження відсоткового рівня м'язів нижче вікової норми. Це свідчить про те, що молоді лікарі не ведуть здоровий спосіб життя. Біоімпендансний метод оцінки складу тіла клінічно допустимий для ранньої діагностики.

КЛЮЧОВІ СЛОВА: біоімпендансний метод; склад тіла; неінфекційні захворювання.

БИОИМПЕНДАНСНЫЙ МЕТОД ОЦЕНКИ СОСТАВА ТЕЛА В АЛГОРИТМЕ И ТЕХНОЛОГИЯХ ВНЕДРЕНИЯ ЗДОРОВОГО СПОСОБА ЖИЗНИ ДЛЯ ПРОФИЛАКТИКИ И КОНТРОЛЯ НЕИНФЕКЦИОННЫХ ЗАБОЛЕВАНИЙ В ПРАКТИКЕ СЕМЕЙНОГО ВРАЧА

©М. М. Потяженко[1], А. В. Невойт[1], Н. Л. Соколюк[1], М. М. Невойт[2], Л. П. Озарчук[2]

[1]УНИ последипломного образования ВГУЗУ «УМСА»
[2]2-я городская клиническая больница, г. Полтава

РЕЗЮМЕ. Сегодня для медицинской общественности понятны важность профилактики и контроля над неинфекционными болезнями. В работе нами сделана попытка определения чувствительности биоимпендансного метода оценки состава тела для оптимизации алгоритма внедрения здорового способа жизни для профилактики неинфекционных заболеваний в практике семейного врача. На мониторе состава тела (HBF-500-E Omron, Япония) обследовано 59 врачей-интернов (средний возраст (24±2) года; 47 (79,6 %) – женщины). У 25 % и 19 (33 %) респондентов установлено увеличение индекса массы тела ≥25 кг/м^2 и содержания жира соответственно. У 56 (95%) – установлено снижение процентного уровня мышц ниже возрастной нормы. Это свидетельствует о том, что молодые врачи не ведут здоровый образ жизни. Биоимпендансный метод оценки состава тела клинически приемлем для ранней диагностики.

КЛЮЧЕВЫЕ СЛОВА: биоимпендансный метод; состав тела; неинфекционные заболевания.

Отримано 22.03.2017