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Book review

Obesity: a Public Health Problem and Medical Challenge

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The medical community of Rijeka has had significant achievements in its history, even its moments of glory, and made notable contribution to the Croatian medicine and biomedical sciences. Development of medical science and profession in Rijeka has always met with approval and support from the Croatian Academy of Sciences and Arts, and one of its presidents, academician Andrija Štampar made a major contribution to the establishment of the School of Medicine in Rijeka in year 1955. Department for Clinical and Transplantational Immunology and Molecular Medicine was established by the Academy in Rijeka in 2013 and it was the first medical institute founded by the Academy outside Zagreb. A significant portion of the Institute's activities involve organization of forums, workshops and meetings on current scientific topics, and of national and international gatherings. The intention is to organize meetings that respond to the needs of the moment and discuss leading trends in biomedicine so that the most recent advances, considerations and visions may echo significantly in the medical circles of Rijeka and beyond. In this manner, the Department will also help establish local research potential and ensure availability of information to the widest possible circle of scientific and medical staff.

The newly established Department developed important research activity already in its first year and organized numerous scientific meetings. International symposium entitled "Obesity – a Public Health Problem and Medical Challenge" was organized by the Department together with Croatian Society for Obesity, Croatian Medical Association, and with Clinical Hospital Center Rijeka. The symposium was held in Rijeka on May 8, 2014 and the Department for Clinical and Transplantational Immunology and Molecular Medicine published papers by speakers invited from Croatian Academy of Sciences and Arts as its first edition.

Obesity as the symposium topic was selected – as emphasized in the symposium title – because it poses as a considerable public health and medical issue. At the time when healthcare costs are becoming an unbearable burden for society that has to provide equal conditions for healthcare for all, it is highly important to attempt to shed some light on all aspects of obesity which is assuming the proportions of an epidemic. All this indicates the topicality of both the symposium and this book. As a physiology professor, I take as a starting point the fact that obesity is the consequence of imbalance between the amount of calories

consumed and burned in the body. In ideal case, there is balance between these amounts. If calorie intake is increased without concurrently heightened calorie expenditure through increased activity, or with simultaneously decreased burn, imbalance occurs resulting in obesity and all its consequences discussed in this book. Thus, in order to decrease body weight it is necessary to lessen calorie intake and/or increase body activity.

Body mass index (BMI) is the ratio of body weight in kg and height in m^2. According to this criterion, overweight persons are those with the BMI higher than 25, while those with BMI over 30 are considered obese. The introductory section of the book, i.e. the chapter entitled *Epidemiological Aspects of Obesity* discusses genetic aspects and particularly epidemiological data on Croatian population. Results are presented of studies addressing preschool and school age obesity which has been recognized by society as an ever increasing problem because habits from this age of life are most often carried throughout life. Ever since the earliest age of life, obesity and its consequences belong among the most significant public health problems in the entire European Union. According to data by European Commission, there are over 22 million children in Europe who are overweight or obese, and this number is annually increasing by 400,000 so that it may be said that this phenomenon assumes the proportions of an epidemic. Obesity in childhood correlates with risk factors for development of diabetes, cardiovascular diseases and other comorbidities at adult age. Obese children and adolescents are subject to development of mental health problems, which also increases psychosocial morbidity. To combat this, European Commission has since 2006 been implementing organized activities whose focus is placed particularly on school and family. Consequences of obesity are tackled at adult age. Croatia is in the upper third of developed countries in terms of registered prevalence of adult obese individuals. It has been established that the risk for obesity is highest both in men and women in the 45–54 year age range, particularly in rural settings among individuals with low education level who are prone to drinking and among nonsmokers. It is therefore of outstanding importance to have a developed strategy of initiatives in the entire society and public health system, promote a healthy way of life, healthy diet and body activity in order to minimize obesity consequences. The most recent data and epidemiological analyses presented in the book are the basis for comprehending the depth of the problem and for preparation of strategies and long-term action plans.

In the chapter *Pathophysiological Mechanisms of Obesity*, four articles provide a contemporary view of some pathophysiological mechanisms which facilitate the development of obesity and complications that may occur. Orexigenic substances (ghrelin, motilin) are discussed, as well as anorexigenic signals from gastrointestinal tract directed toward cholecystokinin (CCK), YY (PYY3–36) peptide and glucagon-like peptide 1 (GLP-1) that act as satiety signals and reduce food intake. Data are also presented on the correlation between bacteria of intestinal microflora and obesity in experimental animals, together with results of studies where prebiotics, probiotics and antibiotics have been used in an attempt to influence obesity prevention. Of particular interest is a paper describing the mechanisms by which visceral adipose tissue causes inflammation in the abdominal type of obesity. In this regard, the role of M1 type of macrophages is especially emphasized and the most recent insights of a group of Croatian scientists are presented on the role of NK cells in the development of visceral adipose tissue inflammation. The development of metabolic syndrome (MetS) enhances the risk of cardiovascular diseases, stroke and diabetes. Brain-derived neurotrophic factor (BDNF) is a neurotrophin primarily involved in numerous functions and activities of the nervous tissue. It is also included in the control of nutrition, food intake, metabolism and energy consumption, as well as in cardiovascular, energy- and glucose homeostasis. A study by a group of Croatian researchers gives hope that mechanisms and associations between BDNF and MetS will be found, together with possibly new targets and therapeutic strategies in a combat against obesity and metabolic syndrome.

A chapter entitled *Clinical Aspects* discusses and elucidates an interesting phenomenon that has otherwise been described as obesity paradox during aging. Actually, it deals with a fact that mortality among individuals with chronic illnesses and increased BMI, particularly those at an advanced age, is lower than among those with lower BMI although obesity has otherwise been an important risk factor for a number of diseases ranging from cardiovascular to malignant ones. In the chapter on clinical aspects I may point out two articles that discuss effects of obesity on the cardiovascular system and describe how to help an obese diabetic patient, thereby stating that obesity therapy is an integral part of treating an obese diabetic patient.

The fact that healthy diet is a key constituent of health is stressed in the chapter entitled *Prevention and Therapy*. Today the number of obese individuals roughly equals the number of starving people. Obesity is an increasing financial burden in healthcare. The McKinsey Global Institute believes that the cost of obesity worldwide is generally the same as the cost of smoking and exceeds the joint costs of alcohol consumption and climatic changes. This is also true in Mediterranean countries, particularly regarding children whose obesity is caused by increased absence of movement and ever more foods with too much sugar and salt due to globalization that makes inexpensive food available through global food companies. The chapter further addresses definition of diet (macronutrients and micronu-

trients), definition of functional nutrition, chemical groups of nutraceutics, herbal polyphenols, expectations from a new generation of functional foods, and strategy of obesity control by using nutraceutics. A rising public health problem of obesity requires multidisciplinary approach to therapy. Fundamental approach to obesity treatment is change of life habits, which is accompanied by pharmacological methods of therapy and endoscopic and surgical methods.

The book provides a comprehensive view of public health- and medical aspects and consequences of obesity, and may be a very useful guide both to experts engaged in prevention and to physicians who daily encounter an ever increasing number of overweight patients and treat obesity and many obesity-related complications. I can also recommend this book as an excellent reading for postgraduate students and undergraduate students willing to broaden their knowledge in this field.