
Symposium

MUSCULOSKELETAL DISEASES IN THE ELDERLY

ABSTRACTS

Preface

The scientific symposium entitled **Musculoskeletal Diseases in the Elderly** was organised by the Department of Medical Sciences of the Croatian Academy of Sciences and Arts, the Academy of Medical Sciences of Croatia, and the Croatian Medical Association. The Symposium was held on 15 October 2021 at the Library of the Croatian Academy of Sciences and Arts in Zagreb, Croatia. The meeting started with welcoming speeches from Vida Demarin, F.C.A., Secretary of the Department of Medical Sciences of the Croatian Academy of Sciences and Arts, and Prof. DSc Alemka Markotić, President of the Academy of Medical Sciences of Croatia. The next speaker, Marko Pećina, F.C.A., speaking on behalf of the organisers, stressed that this Symposium is following the yearlong tradition of organising scientific and professional meetings at the Croatian Academy of Sciences and Arts, dedicated to the topics from the domain of gerontology. He thereby reminded the audience of the publication entitled (in translation) *Symposium on Gerontology*, published in 1958 and edited by Franjo Kogoj, F.C.A., at the time Secretary of the Academy Department of Medical Sciences. This publication includes papers by the then most esteemed professors of the Faculty of Medicine in Zagreb from the fields of basic and clinical medical sciences. The title of this Symposium – *Musculoskeletal Diseases in the Elderly* – might justly be broadened to *Symposium on Gerontology*, considering the fact that plenary speeches were concentrated on general gerontology issues. Prof. DSc Jadranka Morović-Vergles, speaking on behalf of the organisers as well, stressed the importance of paying attention to the problem issues of musculoskeletal diseases within the domain of gerontology. She continued by emphasising major importance of launching residency in geriatric medicine in the EU and introducing practical implementation of residency in geriatric medicine in Croatia.

The beginning of the Symposium was marked by keynote lecture given by Prof. DSc Nenad Bogdanović from Karolinska Universitetssjukhuset in Stockholm. Professor Bogdanović started with an overview presentation entitled *Geriatric Medicine – the Youngest Specialization for the Oldest Population*. Stjepan Gamulin, F.C.A., in his lecture entitled *The Pathophysiology of Ageing*, stressed that though ageing cannot be stopped, the process of ageing may be decelerated. Prim. DSc Spomenka Tomek Roksandić held a lecture on *Gerontology – Sustainable Development of Health Care for the Elderly*. Prof. DSc Ivana Kolčić from the Faculty of Medicine in Split spoke of the influence of healthy life on “healthy” ageing. The following four lectures addressed more narrowly the main topic of the Symposium. Prof. DSc Jadranka Morović-Vergles presented the newest knowledge on polymyalgia rheumatica and giant cell arteritis. The lecture by Vanda Eđed, M.D., resident in geriatric medicine at the *Dubrava* Clinical Hospital in Zagreb, addressed this topic based on a case report from clinical practice. Painkillers prescribed for elderly patients, with the emphasis on musculoskeletal diseases, was the topic of the lecture by Prof. DSc Duška Martinović-Kaliterna from the Faculty of Medicine in Split. In

their lecture entitled *Elective Joint Replacement in Elderly Patients*, Prof. DSc Alan Ivković from the *Sveti Duh* Clinical Hospital in Zagreb and Marko Pećina, F.C.A., stressed the fact that a patient’s old age does not represent a counter indication for the subject operations. The concluding speech, entitled *Postgraduate Specialty Training in the European Union and Croatia*, was dedicated to the problem issues relating to the establishing of various residencies in the EU and in Croatia, as well as to the launching of residency in geriatric medicine. This speech was held by Prof. DSc Nada Čikeš from the Faculty of Medicine in Zagreb, who has for years participated in drafting medical residency programmes in the EU. The round table discussion held after the lectures was moderated by Prof. DSc Jadranka Morović-Vergles. It covered two topics: first systematic education in geriatric medicine (undergraduate study programmes; permanent education courses) was tackled, with regard to the fact that it is estimated that in 2030, Croatia will have nearly 30% citizens aged over 60; and second, a discussion followed addressing the importance of establishing systematic communication channels between family physicians and rheumatologists/clinical immunologists, with the aim of conducting early interventions, i.e. timely medical check-ups, as well as early and appropriate treatment of patients suffering from systemic inflammatory rheumatic diseases, in particular those of elderly age.

Organizers of the Symposium

Marko Pećina, F.C.A.

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GERIATRIC MEDICINE – THE YOUNGEST SPECIALIZATION FOR THE OLDEST POPULATION

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Europeans are living increasingly longer due to healthier lifestyles and improved medical and hygienic care. The consequence of the ageing of the society rises the demand for health care specialist of older people via specialization in geriatric medicine. Geriatric medicine concerns not only physical, but also mental, emotional, social and environmental needs in the old age as well as underlines preservation of functional independence even in the presence of multiple chronic diseases. Specifically the specialist in geriatric medicine should be able to identify the unique features of disease presentation in older people, the treatment of various comorbidities, the need for **comprehensive geriatric assessment (GCA)**, needs thoughtful drug prescribing as well as a contribution to discharge planning and the management of ethical issues and incurable care. Some of the typical giants in geriatric medicine that should be assessed and managed in the frame of medical, psychological and social problems, are immobility, instability, incontinence, and impaired intellect but with a new era some additional geriatric syndromes do appear: frailty, sarcopenia, the anorexia of aging, and cognitive impairment. These conditions are the forerunners of falls, hip fractures, depression, and delirium. Expertise in geriatric medicine should not be exclusive skill of geriatrician but of primary care or family doctors who should be able to manage: the frailty, morbidity and mortality, hospital admission, and postponing institutionalization. The geriatric health care program should be the priority in each country where hospitals should offer an *acute geriatric ward, an outpatient clinic, a geriatric day hospital* and internal *and external liaison functions*. The carrier of this program is **multidisciplinary team** composed of a geriatrician, geriatric nurse, a social worker, a physiotherapist, an occupational therapist, a speech therapist, a dietician, and a psychologist. The key to deliver good health services for older people is a partnership across the whole health and social care framework in a region. For the sake of growth and prosperity the geriatric medicine needs to embrace not only the care for the geriatric patient, but also research on ageing and education in geriatric fields as components of its core mission. Geriatric care should provide longitudinal, proactive, and coordinated care to complex patients. The greatest challenge is the motivation of young people to accept a job in the care for the old frail people. Geriatric medicine should create a positive image of the frail patient by stimulating the knowledge about this patient population through graduate, postgraduate curriculum, and the development of research. Well established **Geriatric Health Care Program** is a proof that geriatric patients and their problems have been taken seriously by the government.

THE PATHOPHYSIOLOGY OF AGEING

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“At the biological level, ageing results from the impact of the accumulation of a wide variety of molecular and cellular damage over time. This leads to a gradual decrease in physical and mental capacity, a growing risk of disease, and ultimately, death” (WHO 2018). The ageing is a consequence of interaction of genomic and environmental factors. About 200 genes are registered as genomic factors involved in ageing, and it seems that heredity contribute about 20% in ageing trait. Environmental factors comprise a great number of factor acting as macromolecular damaging agents or modifier of various processes involved in ageing and thus promote ageing (for instance oxygen free radicals or nutrition respectively). Various ageing factors are interconnected by positive feedback loops giving a progressive course of ageing. Consequently the ageing steadily aggravates, and it cannot be stopped, but only slowed down. The ageing is very variable, the rate of individual ageing can be normal (in range for particular population), accelerated with premature expression of aged phenotype (secondary ageing) or slower with maintained functional capacity (healthy ageing). The essential mechanisms of ageing can be identified on all levels of organization of the organism from macromolecular to organismic. Macromolecular level, DNA: damages, telomere shortening, genomic instability, epigenetic alterations; protein: misfolding with loss of proteostasis (protein homeostasis). Subcellular level: mitochondrial dysfunction, endoplasmic reticulum stress, deregulation of signaling pathways. Cellular level: cellular senescence, stem cell exhaustion. Systemic level: altered intercellular communication (endocrine, cytokine...). inflammaging, immunosenescence, loss of homeostasis). Organic level: cardiovascular, respiratory, renal, muscular, skeletal, neurocognitive, Organismic level: ageing phenotype (frailty – gerastenia, ageing syndromes, increased risk to age-related diseases) and multimorbidity. “Frailty is progressive age-related decline in physiological systems that results in decreased reserves of intrinsic capacity, which confers extreme vulnerability to stressors and increases the risk of a range of adverse health outcomes” (WHO, 2015). Gerastenia is a proposed term for frailty. Multisystemic decline of functional reserve (brain, endocrine, immune, skeletal, muscular, cardiovascular, respiratory, renal) is the background of decrease of stress resilience– the failure in return to basal homeostasis after stress response. Progressive global population ageing is a great challenge and impose a great burden to all aspects and levels of society. The health system is particularly involved with these challenge and burden. To cope with them the understanding of ageing mechanisms is essential enabling the strategy of healthy ageing. This is target of WHO Decade of Healthy Ageing 2020-2030.

**GERONTOLOGY - SUSTAINABLE DEVELOPMENT OF
HEALTH CARE FOR THE ELDERLY**

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Identifying, monitoring, studying, evaluating, and planning the health needs of the elderly in the early (65-74 years), middle (75-84 years) and advanced age (> 85 years) becomes the most important gerontological public health indicator of progress or failures in health care of the entire population. This is confirmed by both European and Croatian gerontological research, according to which effective compressive health care is most pronounced in reducing health problems and functional disabilities in middle and old age. The purpose is to rationalize growing geriatric consumption. Evaluation with quality control of the implementation of the Program of health measures and procedures in health protection of the elderly with the Program of primary, secondary, tertiary, and quaternary prevention for the elderly is a good indicator of achievement and development and safety of their health care at local and national level. It is understandable and clear in connection with the above that the growing scope of professional interest lies in continuing education in gerontology, geriatrics and geriatric health care and rehabilitation by experts of the interdisciplinary gerontology team, including gerontologists, geriatricians, psycho-geriatricians, family physicians gerontological/geriatric nurses, social workers, physiotherapists, gerontotonutrists, occupational therapists for the elderly, geronto-housewives, geronto-nurses, geromanagers, and lawyers for the elderly.

Sustainable development of health care for the elderly is dictated by educational contribution from gerontology and geriatrics to develop gerontological norms of organizational geriatric activity by counties (regions) of Croatia, appropriate program of health measures and procedures in health care for the elderly and improving the algorithm quaternary prevention for the elderly, diagnostics, treatment, care, and rehabilitation of geriatric insured persons.

HEALTHY LIFESTYLE FOR HEALTHY AGEING

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Abstract

We live in unprecedented times, longer than ever and enjoying the most advanced health care, yet we are far from being truly healthy. For example, a recent study in 8,721 American adults found that only 12% of subjects were metabolically healthy, while never-smokers, individuals practising vigorous physical activity, and those having low body mass index (BMI) had a greater prevalence of metabolic health¹. Additionally, several cohort studies have demonstrated that a healthy lifestyle is predictive of favourable health outcomes and healthy ageing. For example, during 7.8 years of follow-up in 23,153 German adults, it was found that individuals who were never-smokers, had a BMI < 30 kg/m², performed ≥ 3.5 h/week of physical activity, and adhered to a healthy diet, experienced a 78% lower risk of developing a chronic disease (93% for diabetes, 81% for myocardial infarction, and 36% for cancer) compared to subjects without these healthy habits². Furthermore, 50 year-olds who never smoked, had normal BMI, daily physical activity, moderate alcohol intake, and a healthy diet could expect 14 years longer life expectancy in women and 12 years in men, compared to the control group, with reduced cardiovascular and cancer mortality³. Unfortunately, < 10% of the adult Croatian population reported regular physical activity⁴, 30% are smokers, 57% are overweight or obese, 40% have raised blood pressure⁵, 7% of the population is diabetic⁶, while 31% of Croatian eight-year-old girls and 39% of boys were overweight or obese in 2015⁷. At the same time, the Mediterranean diet is on the decline, especially in younger generations⁸. Along with population ageing, these factors contribute to the increased burden of disease in Croatia and the shortest healthy life expectancy at the age of 65 for Croatians, compared to other European countries⁹. Hence, we would strongly benefit from lifestyle medicine, a new paradigm in medicine responding to the population's true health needs. It is on the way to becoming an independent speciality, aiming to prevent, treat, and reverse chronic diseases using the behaviour change in the domains of healthy nutrition, adequate sleep, physical activity, stress management, and avoidance of addictions. This approach now provides solid scientific evidence for adding more life to years and more years to people's lives. For example, it was shown that a healthy lifestyle could even reverse atherosclerosis¹⁰ and diabetes¹¹. Such findings are indispensable in the current public health crisis due to the COVID-19.

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POLYMYALGIA RHEUMATICA AND GIANT CELL ARTERITIS

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Polymyalgia rheumatica (PMR) is a rheumatic disorder characterized by pain and stiffness around the neck, shoulder, and hip area that is worse in the morning and improves with use. This disorder typically presents in people over the age of 50 with an incidence increasing with age. Women are more frequently affected than men. PMR is an inflammatory condition associated with an elevation of C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR). Challenges with PMR lie in making the correct diagnosis and in the appropriate treatment. Prolonged therapy with glucocorticoids and patient-tailored dosing are the mainstay of treatment. Patients with PMR can have coexisting giant cell arteritis (GCA). PMR and GCA can frequently overlap, and 20% of patients with PMR will be diagnosed with GCA later in the course of the disease. In biopsy-proven GCA, PMR features can present in up to 50% of the cases.

GCA, also called temporal arteritis or cranial arteritis, is a vasculitis of large and middle-sized arteries that affects patients over the 50 years of age. It is the most common vasculitis of older age. Histological changes, typically inflammatory infiltrates between the media and intima layers of the vessels, lead to partial or complete obstruction of local arterial blood flow with the corresponding clinical manifestation of ischemia. The majority of GCA symptoms result from the involvement of the cranial branches of the aorta although the involvement of thoracic or abdominal part of the aorta and its branches are not uncommon. Most common symptoms of GCA are acute headache, scalp pain, tongue, jaw or limb claudications and visual defects with general symptoms such as low-grade fever, malaise, fatigue or anemia. Ocular involvement (anterior optic ischemic neuropathy (AION), or less commonly retinal artery occlusion) may lead to irreversible visual loss and for this reason early diagnosis and treatment of GCA is of major importance. Glucocorticoids are the main modality of treatment, and they should be started as soon as possible in suspected cases to prevent irreversible visual loss and other ischemic complications. Recently, arising from a better knowledge of GCA pathophysiology, tocilizumab (IL-6R inhibitor) has gained significant importance in the treatment of GCA, especially for patients with refractory or relapsing disease or in patients who are intolerant to glucocorticoids.

TREATING PAIN IN ELDERLY

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Persistent pain is part of aging, and it is frequently disabling in elderly. Regarding the increased number of older individuals it is obvious that special pain treatment is obligatory. There are various changes associated with the aging, including age-related physiologic changes and decreased renal excretion, sensory impairments, polypharmacy and multimorbidity. Degenerative spine disorders and arthritic conditions are the most common cause of chronic pain in the elderly, then neuropathic pain, ischemic pain, and pain due to cancer.

Beside non-pharmacological treatment it is best to start with drug of least toxicity. For mild pain paracetamol is recommended, and for mild to moderate pain combination of paracetamol and NSAIDs. The most serious complication of paracetamol is hepatotoxicity. NSAID therapy in elderly is related to great risk of gastrointestinal, renal, and cardiovascular side effects. Risk of NSAIDs is dose-dependent, increases with age, and with concomitant use of cardio protective drugs. Micronized NSAIDs provide comparable efficacy at lower doses with minimized adverse effects. For pain refractory to NSAIDs a weaker opioid agonist are recommended, such as tapentadol (risk of hypotension, respiratory depression, sedation) and tramadol (caution of sedation, cognitive impairment). The use of strong opioids has a great risk of respiratory depression, and drug accumulation in elderly with hepatic and renal dysfunction. Cannabinoids showed a marked reduction in pain and better safety profile compared to opioids.

Gabapentin and pregabalin are recommended for neuropathic pain including diabetic neuropathy, spinal cord injury, postherpetic neuralgia, and fibromyalgia. Serotonin-norepinephrine reuptake inhibitors such as venlafaxine and duloxetine can also be used for neuropathic pain in the elderly. Tricyclic antidepressants are effective in the treatment of postherpetic neuralgia and painful diabetic neuropathy. Muscle relaxants: Baclofen, a GABA-B agonists are useful in neuropathic pain same as Calcitonin especially for osteoporotic vertebral compression fractures and bone metastases.

ELECTIVE JOINT REPLACEMENT IN ELDERLY PATIENT

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Patients over the age of 65 are the fastest growing segment of the population, and it is estimated that it will comprise 20% of the entire population in the developed countries until year 2030. Advances in medicine, science and healthy lifestyles have promoted substantially increased lifespans, as well as better quality of life with more physical activity. On the other hand, aging is associated with a variety of physiologic changes that affect musculoskeletal system and decrease quality of life. Osteoarthritis (OA) is the most common form of arthritis with over 151 million sufferers worldwide. It rises in frequency with age, and it represents a major source of pain and disability of the large joints in the aging population. Hip and knee arthroplasty are among the most successful orthopaedic procedures performed today, and in advanced stages of the OA, partial or total joint arthroplasty should be discussed with a patient. Contrary to the common opinion that elderly patients are not good candidates for elective joint surgery, most of the available evidence indicate that elderly patients that underwent hip or knee replacements experienced excellent long-term outcomes. In addition, there is strong evidence that preoperative comorbidity and functional limitations are much stronger predictors of unsatisfactory outcome after total joint replacement. In other words, age alone is not a factor that affects the outcome of joint arthroplasty and should not be a limiting factor when considering who should be a good candidate for elective joint replacement. This review summarizes some challenges and opportunities of performing elective joint replacements in orthogeriatric patient.

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A CLINICAL PRESENTATION OF A FEMALE GERIATRIC PATIENT WITH POLYMYALGIA RHEUMATICA

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Polymyalgia rheumatica is the most common inflammatory rheumatic disease in patients over 50 years of age. Considering the fact, that geriatric patients often suffer from various comorbidities and take prescribed medications for many clinically relevant health issues, it is well known that, in this particular population, with ongoing age, occurs also an ongoing number of drug interactions, side effects and complications after certain therapeutic interventions and investigations. It is roughly estimated that generally about 30% of all hospitalizations are caused by this health issue. It is possible, using an adequate geriatric approach, to considerably minimize this problem.

We represent this problem with a clinical presentation of a 73-year old female patient who was administered to the hospital with complaints of overall weakness, intense neck and both shoulders pain, morning stiffness, considerable loss of weight and mobility. In her medical history was mild regulated hypertension and use of various analgesics and antirheumatics. Diagnostics revealed heightened sedimentation rate, high CRP, microcytic anemia and hypoalbuminemia. The ultrasound showed both shoulder bursitis. The diagnosis of polymyalgia rheumatica was stated and corticosteroid therapy started. After 24 hours therapy and prompt considerable improvement of the patient state, the patient was released after 2 days hospitalization with recommendations of prolonged corticosteroid treatment with gradual declining dose. Additional therapy was prescribed like iron, calcium, vitamin D supplements and high energy and protein nutrition drinks. After 3 weeks at the control checkup the patient had complaints of intense pain in the middle back area, started 3 days ago. She also mentioned additional loss of weight and intense thirst. Diagnostics revealed compression fracture of the Th 11 vertebra, densitometry showed osteoporosis. There were also signs of hyperglycemia and raised blood pressure. Additional treatment was prescribed in form of bisphosphonates, oral hypoglycemics, antihypertension drugs and nutrition drinks for diabetics. After 2 months the patient recorded

of substantial overall improvement in form of pain relief, better mobility, normalized inflammation parameters, glycemia and blood pressure. She started to gain weight as well.

Showing uprising multiple comorbidities and the course of treatment by a geriatric holistic point of view with reference to medical interactions and side effects, with their clinical implications, it is possible to increase the sensibility, faster recognizing of the problem and increase the possibility of effective prevention of hospitalizations caused by iatrogenic complications.

POSTGRADUATE SPECIALTY TRAINING IN EUROPEAN UNION AND CROATIA

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Postgraduate specialty training is an important highly standardised segment in the continuum of medical education. In Europe, it is described in the document *European Training Requirement for Specialty of ... European Standards of Postgraduate Medical Specialist Training (ETR)*, which defines the requirements for trainees, trainer and training institutions. Within the activities of the European Union of Medical Specialists (UEMS), specialist sections participate in a clearly defined ETR development and revision process. In the review and approval process, the final decision of the National Medical Associations from the EU/EEA member states is required.

The training requirements for trainee comprise the content of training with learning outcomes and organisation of training including the assessment and evaluation. The training requirements for trainers encompass the process for recognition as trainer and quality management of trainers. The training requirements for training institution involve the process for recognition as training institution (requirements on staff, clinical activities, equipment) and quality management (accreditation, clinical governance, manpower planning, external auditing etc).

Specialty training is competency based, not oriented towards the period of clinical rotations, but towards trainee, and trainee's progress in the acquisition of competencies. An important place in the curriculum includes generic competencies, Canadian Framework of Competencies (CanMEDS) being the most accepted in the world. Special attention is paid to methods of workplace-based assessment of competencies. In addition to defined methods that assess clinical and procedural skills, professional behaviour is also evaluated, most often by the 360 degree multisource feedback assessment. In new ETRs, the assessment of the progress of trainees is presented by introducing Entrustable professional Activities (EPAs) characteristic of each specialist programme. In order to achieve harmonisation of the standards of specialist training in Europe and high European standards of health care, UEMS is developing the European specialist examinations, which have so far been organised by 32 specialties. The exam can be taken by trainees in the last year of specialty training or after taking the national exam.

Ten years ago, 49 specialist training programmes were introduced in Croatia harmonised with European standards. In the meantime, quality of specialist training has been enhanced, new learning contents, methods of teaching and learning and new European documents introduced; thus, responsible Croatian institutions must insist on the advancement of the specialist education standards in Croatia. The pandemic crisis has shown the need to further improve specialty training and requires the development of new contents and standards.