

(mean age 42.09 (range 19-77) years, 75 female, 26 male, EDSS score 3.1 (range 0.0-7.0)). The average duration of the disease was 13.5±7.487 (range 1-42) years. Thirty-six patients were treated with disease modifying therapies (DMTs). Information on comorbidities was obtained during the medical interview. Data was analysed using software package IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp.

Results: 33% (n=34) patients did not have any comorbidities, and there is an equal number of patients (n=34, 33%) that just had one comorbidity. 17.6% (n=18) of patients had two comorbidities, and 15.7% (n=16) three or more comorbidities. The most frequent comorbidity was depression found in 25 (24.75%) patients (19 (18.8%) women, 6 (5.9%) men), followed by the hypertension in 12.87% (n=13). Hyperlipidemia and migraine were each found in 6.93% (n=7), and hypothyreosis and arrhythmia each in 3.96% (n=4). The number of the comorbidities was found to significantly increase with the duration of MS ($r=0.232$, $p=0.037$). Women were found to have significantly bigger numbers of comorbidities than men ($t=-2.59$, $df=74$, $p<0.05$). Older patients with MS were found to have significantly more comorbidities ($r=0.335$, $p<0.01$).

Conclusions: This study gives insight into the presence of comorbidities in Croatian patients with MS. Connection with comorbidities must be considered when managing patients with MS. Any other comorbidity in MS may also affect the condition of the patient in general, and also their quality of life, and requires a tailored approach in management.

Key words: Multiple sclerosis (MS) - comorbidities - Croatia - depression - vascular risk factors (VRFs) - migraine

* * * * *

PSYCHIATRIC COMORBIDITIES IN PARKINSON'S DISEASE SEEN THROUGH THE PRISM OF GENOMICS AND EPIGENETICS

Antonela Blažeković¹ & Fran Borovečki^{1,2}

¹Department for Functional Genomics, Center for Translational and Clinical Research, University of Zagreb, School of Medicine, University Hospital Center Zagreb, Zagreb, Croatia

²Department of Neurology, University Hospital Center Zagreb, Zagreb, Croatia

Parkinson's disease (PD) is a neurodegenerative disorder clinically characterized by motor dysfunctions due to progressive loss of dopaminergic neurons and a broad spectrum of non-motor symptoms. Interestingly, non-motor symptoms like depression, anxiety and psychosis are often present several years before the occurrence of classic motor features seriously affecting patient quality of life. Their presence is often misleading, delaying the correct diagnosis of PD. Despite its high incidence, the pathophysiology and aetiology of neuropsychiatric symptoms associated with PD remains unclear. Currently, a lot of interest lays in research looking for genetic predictors of motor and non-motor symptoms in PD. The availability of next-generation sequencing technology for genome, epigenetic and transcriptional analysis opens the door to a new way of studying multifactorial diseases like PD and their comorbidities. In this review we will present new insights in the genomic and epigenetic background of psychiatric comorbidity in Parkinson's disease.

Key words: Parkinson's disease - neuropsychiatric symptoms - genomics - epigenetics

* * * * *

IMMUNOSENESCENCE, INFLAMMAGING AND RESILIENCE: AN EVOLUTIONARY PERSPECTIVE OF ADAPTATION IN THE LIGHT OF COVID 19 PANDEMIC

Marko Banić^{1,3,4}, Sanja Pleško^{2,3}, Marija Urek^{1,3}, Žarko Babić^{1,3} & Duško Kardum^{1,5}

¹University Hospital Dubrava, Zagreb, Croatia

²University Hospital Center Zagreb, Zagreb, Croatia

³University of Zagreb, School of Medicine, Zagreb, Croatia

⁴School of Medicine, University of Rijeka, Rijeka, Croatia

⁵School of Medicine, University of Osijek, Osijek, Croatia

The evolution of immunology enabled the study of role of innate and adaptive immunity in systems biology network of immunosenescence and inflammaging. Due to global reduction in birth rates and reduced mortality, in year 2025 there will be about 1.2 billion of people over age of sixty, worldwide. The notion that the real age is not chronological, but the biological one led to the concept of „bioage“,

defining the biologic reactivity and resilience, including the immune competence of an individual. A competent immune network, systemic and mucosal is intrinsic to resilience and homeostasis of the human holobiont as the unit of evolution. In elderly, the immunosenescence could be associated with higher levels of proinflammatory mediators (such as IL-6), frailty and mortality. Pro-inflammatory state in elderly is denoted as inflammaging, characterized with low-grade (sterile) inflammation, as a physiologic response to life-long antigenic stimuli. When under control, inflammaging could be regarded as an efficient defense mechanism, opposed and regulated by anti-inflammatory pathways and molecules. Immunosenescence. The emerging concepts of „individual immunobiography“ and „trained immunity“ speak in favour that the immunological experience during the life would shape the ability of each individual to respond to various stimuli, strongly influencing the elements of innate and adaptive immunity, including macrophages and innate lymphoid cells. Older age is one of the main risk factors for the severe clinical picture and adverse outcome of COVID-19 infection., due to immunosenescence and chronic low-grade inflammation (inflammaging), both characterizing the immune reaction in elderly. The senescent immune system, along with the advanced process of inflammaging is prone to react with uncontrolled activation of innate immune response that leads to cytokine release syndrome, tissue damage and adverse outcome of infection. Further research is aimed to nutritional and pharmacologic (immunomodulatory) interventions to influence the process of bioaging and immunosenescence, and to modulate the reaction of elderly to infection, including the COVID-19.

* * * * *

PAINFUL AND ITCHY DERMATOSES CARRY THE HIGHEST PSYCHOLOGICAL BURDEN FOR DERMATOVENEREOLOGICAL PATIENTS

**Iva Dediol¹, Mirna Situm^{1,2}, Vedrana Bulat¹, Tomo Stugnetic³, Josip Juras⁴,
Dean Tomljenovic¹ & Marija Buljan^{1,2}**

¹*Department of Dermatovenereology Sestre milosrdnice, University Hospital Centre, Zagreb, Croatia*

²*School of Dental, Medicine University of Zagreb, Zagreb, Croatia*

³*Psychiatric Hospital Rab, Rab, Croatia*

⁴*Department of Obstetrics and Gynaecology, University of Zagreb, School of Medicine, University Hospital Centre Zagreb, Croatia*

Background: Most dermatovenereological diseases are not life-threatening but nevertheless are highly prevalent disorders. Psychosocial aspects of skin diseases and physical symptoms strongly influence patient's quality of life (QoL) which results in the development of different coping mechanisms in patient's behaviour. Development of psychiatric comorbidity in patients with skin diseases is well known. On the other hand, little is known about psychological comorbidity associated with dermatovenereological diseases. Aims of this study were to investigate QoL and psychological burden among dermatovenereological patients.

Subjects and methods: Two hundred and ninety patients suffering from different dermatological and venereological diseases participated in the study, divided into three study groups: itchy/painful dermatoses, non-itchy/non-painful dermatoses and venereological diseases. Participants completed standardized psychological questionnaires: Dermatology Specific Quality of Life (DSQL), Beck Depression Inventory (BDI) and State and Trait Anxiety Inventory (STAI). Intensity of the disease and localisation of the lesions were also assessed.

Results: Physical aspect of QoL was mostly influenced by itchy/painful dermatoses but psychological aspect and everyday activities and choices were mostly affected by patients with non-itchy/non-painful dermatoses and venereological diseases. 4.1% of participants had serious depressive symptoms, 11.5% had high and very high anxiety symptoms as state and 15.6% as trait. However, participants with severe skin conditions were more depressed, while participants with always and sometimes exposed lesions were more anxious.

Conclusion: It is essential to recognise subgroups of dermatovenereological patients whose treatment approach should be interdisciplinary. Further studies are needed to detect psychosocial needs of patients with venereological diseases.

Key words: quality of life - anxiety - depression - skin diseases - venereological diseases

* * * * *