IJAE
Vol. 121, n. 1 (Supplement): 213, 2016
ITALIAN JOURNAL OF ANATOMY AND EMBRYOLOGY

Effects of melatonin long-term treatment in aging mice

Gaia Favero [1] - Claudia Agabiti-Rosei [2] - Claudia Rossini [2] - Lorenzo Nardo [3] - Luca Facchetti [3] - Lorenzo Franceschetti [1] - Enrico Moretti [1] - Stefania Castrezzati [1] - Russel J. Reiter [4] - Damiano Rizzoni [2]

[1] Anatomy and Physiopathology Division, Department of Clinical and Experimental Sciences, University of Brescia, Brescia, Italy - [2] Clinica Medica, Department of Clinical and Experimental Sciences, University of Brescia, Brescia, Italy - [3] Department of Radiology and Biomedical Imaging, University of California, San Francisco, CA, USA - [4] Department of Cellular and Structural Biology, University of Texas Health Science Center, San Antonio, TX, USA

Aging is a complex and progressive process involving every organ in the body and it is the result of coordinated biology events that can span decades (1). At cardiovascular level, age-related degeneration and functional decline are quite heterogeneously, nevertheless oxidative stress is a well known pathological process involved. The aim of this study was to investigate the effects of a chronic and long-term treatment with melatonin on functional responses of small mesenteric arteries and on the expression of oxidative stress markers at aorta level of senescence-accelerated prone mice (SAMP8), a model of age-related vascular dysfunction and cognitive decline (2), respect relative controls, senescence-accelerated resistant mice (SAMR1). In the present study were investigated SAMP8 and SAMR1 mice orally treated or not treated for 10 months with melatonin (MelapureTM by Flamma S.p.A.). It was observed that the anticontractile effect of perivascular adipose tissue is impaired in untreated SAMP8, compared with SAMR1. On the contrary, the chronic treatment with melatonin decreased the contractile response to norepinephrine in mesenteric small arteries of SAMP8, restoring an anticontractile effect, probably through melatonin antioxidant mechanisms. In untreated SAMP8 mice was observed at aorta level also an overexpression of oxidative stress and inflammatory markers compared with controls; whereas the long-term treatment with melatonin in SAMP8 was able to increase the expression of some markers of vasculoprotection and to decrease oxidative stress and inflammation. A reduced expression of adiponectin and adiponectin receptor 1 was also observed at visceral fat level of untreated SAMP8 respect SAMR1, while a significant increase was observed after melatonin treatment. In conclusion, melatonin exhibited marked antioxidant and vasculoprotective effects, underlining its potential anti-aging properties at cardiovascular level.

Sincere thanks to Flamma S.p.A.-Italy (www.flammagroup.com) for courteously providing the melatonin.

References

[1] Corbi et al. (2012) Role of sirtuins, calorie restriction and physical activity in aging. Front Biosci (Elite Ed) 4:768-778.

[2] Takeda (1999) Senescence-accelerated mouse (SAM): a biogerontological resource in aging research. Neurobiol Aging 20:105-110.

Keywords

Aging; aorta; melatonin; mesenteric small arteries; oxidative stress.