

## Protective role of melatonin against obesity-associated vascular dysfunctions

Gaia Favero, Francesco Belotti, Marco Ferrari, Michele Peroni, Ramon Boninsegna and Rita Rezzani

Human Anatomy Division, Department of Biomedical Science and Biotechnology, University of Brescia, Brescia, Italy

Obesity is a chronic, multifactorial and complex disorder common in industrialized countries and strictly associated with increased mortality and morbidity of cardiovascular diseases. Moreover, it results from a long-term positive energy balance associated with chronic low-grade inflammation, in which both genetic and environmental factors are involved (Wang and Nakayama, 2010). Obesity is associated with endothelial dysfunction, arterial stiffness and vasoconstriction, these effects on vascular functions are mediated by low-grade inflammation expansion of adipose tissue and secretion from fat depots of adipokines that directly affect heart and blood vessels (Singhal, 2005; Ouwens et al., 2010).

New emerging data show that melatonin is an affordable, cheap and non-toxic molecule with exceptional potential in body weight regulation and energy metabolism (Reiter and Korkmaz, 2008). However, the exact mechanism of action is not yet fully understood.

In this study, we hypothesized that melatonin administration (kindly provided by Chronolife S.r.l., Roma, Italy) can minimize vascular morphological changes and dysfunctions and ameliorate fat accumulation in a mice model of obesity. In particular, the animals were divided in four groups: (i) control mice without treatment, (ii) control mice treated with melatonin for 8 weeks, (iii) obese mice without treatment and (iiii) obese mice treated with melatonin for 8 weeks.

Compared with the obese group, intake of melatonin was associated with a statistically significant decrease in body weight, blood glucose level, inflammation, fat accumulation and hyperplasia and it restored the correct vascular cytoarchitecture, reducing also inflammation.

These data suggest that melatonin has no toxic effects in mice with normal body weight, but its administration in obese mice reduce fat accumulation and vascular dysfunctions, suggesting its protective role as a tool for effective management of obesity-induced complications, including cardiovascular diseases.

### References

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