

## Metabolic syndrome and beneficial vascular effect of melatonin

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The metabolic syndrome is a cluster of metabolic abnormalities including abdominal obesity, hypertension, altered levels of triglycerides and of cholesterol and high fasting glucose levels (Sohet and Delzenne, 2012). In this study, we hypothesized that melatonin, due to its ability to neutralize a number of toxic reactants, including reactive oxygen species and free radicals (Reiter et al. 2008; Agil et al. 2011), can minimize obesity-related alterations in aorta morphology and vasoconstriction in an animal model of obesity (ob/ob mice). The animals were divided in four groups: (i) control lean mice, (ii) control lean mice treated with melatonin, (iii) ob/ob mice and (iv) ob/ob mice treated with melatonin. The melatonin (kindly provided by Chronolife S.r.l.) was added to the drinking water from postnatal week 5 to 13. Compared with the obese mice, melatonin intake was associated with a significant decrease in body weight and water consumption. Histological analysis showed that the aortic wall of ob/ob mice had a high tunica media/lumen ratio and that the elastic fibers in the medial layer appeared disrupted and degraded. Moreover, the aorta of ob/ob mice displayed both a higher degree of collagen accumulation in the tunica media and an elevated expression of endothelin-1, marker of vasoconstriction, respect to the normal aorta. Whereas, the aorta of ob/ob mice treated with melatonin had a lower tunica media/lumen ratio, collagen accumulation and endothelin-1 expression in comparison with untreated ob/ob mice. In conclusion, our results showed that melatonin had no apparent effects on the aorta of lean mice, but its administration in ob/ob mice can lead to a reduction in body weight and can ameliorate aorta histopathological dysfunctions; so melatonin could be an effective tool in the management of obesity-related vascular complications.

### References

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### Key words

Aorta, melatonin, obesity, vascular dysfunction.