

Melatonin



Fact Sheet

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What is Melatonin?

Melatonin is a pineal hormone that regulates your 24-hour clock (circadian rhythms) and sleep. Recently it has been shown to exhibit unique oxygen scavenging abilities and to have a negative impact of oxidative stress on fertility. Specifically, several studies have demonstrated its negative effect on the number and quality of retrieved oocytes and embryos following in-vitro fertilisation (IVF). Clinical studies support the use of melatonin supplementation in IVF as it may lead to better pregnancy rates.

Melatonin benefits

Melatonin has been identified as a key factor in the regulation of circadian rhythms and the sleep-wake cycle. Long exposure to artificial lighting leads to a reduction in endogenous melatonin exposure.

Melatonin is thus associated with sleep disturbances including insomnia, and much of the literature is focused in this area. It also appears to regulate reproductive seasonal variation in many animal species.

Melatonin as an oxygen scavenger

Free oxygen radicals are created when oxygen is utilised in metabolic processes. These radicals contain 'free' valence electrons, making them highly reactive, capable of causing injury to cells. These are termed 'reactive oxygen species' (ROS). While ROS are necessary for essential physiological processes, an overabundance can result in cellular damage, commonly referred to as 'oxidative stress'.

Anti-oxidative agents (oxygen-scavengers) are present endogenously but can also be administered exogenously. They reduce free radicals by donating electrons to stabilise them.

The evidence on Melatonin

Only one meta-analysis has been performed specifically assessing the use of melatonin in IVF.

This recent systematic review and meta-analysis of five randomised controlled trials found a pooled risk ratio of 1.21 (95% CI 0.98 - 1.50) in favour of melatonin for the outcome of clinical pregnancy rate.

The authors suggested that the adequacy of the data evaluating the usefulness of melatonin is poor, and that it should not yet be recommended for routine use.

While they did not find any worsening of the outcomes of IVF, the authors commented on the lack of live birth rate as an outcome measure as well as the imprecision encountered in all studies considered.

How safe is Melatonin?

Melatonin is also known to be remarkably safe, with the Cochrane systematic review and meta-analysis finding no association between antioxidant supplementation and adverse effects for women involved in treatment.

This meta-analysis which considered studies of melatonin as well as other antioxidants, found a similar non-statistically significant improvement in clinical pregnancy rate when using any antioxidant (OR 1.30, 95% CI 0.92 - 1.85) with a total sample size of over 2000 patients.

References

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