

Melatonin and vitamin C increase umbilical blood flow via nitric oxide-dependent mechanisms

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Inadequate umbilical blood flow leads to intrauterine growth restriction, a major killer in perinatal medicine today. Nitric oxide (NO) is important in the maintenance of umbilical blood flow, and antioxidants increase NO bioavailability. What remains unknown is whether antioxidants can increase umbilical blood flow. Melatonin participates in circadian, seasonal, and reproductive physiology, but has also been reported to act as a potent endogenous antioxidant. We tested the hypothesis that treatment during pregnancy with melatonin increases umbilical blood flow via NO-dependent mechanisms. This was tested in pregnant sheep by investigating in vivo the effects on continuous measurement of umbilical blood flow of melatonin before and after NO blockade with a NO clamp. These effects of melatonin were compared with those of the traditional antioxidant, vitamin C. Under anesthesia, 12 pregnant sheep and their fetuses (0.8 of gestation) were fitted with catheters and a Transonic probe around