Effect of melatonin on sleep in the peri-operative period after breast cancer surgery: a randomized, double-blind, placebo-controlled trial

Michael Tvilling Madsen (1,2), Melissa Voigt Hansen (1,2), Lærke Toftegård Andersen (1,2), Ida Hageman (3), Lars Simon Rasmussen (4), Susanne Bokmand (2), Jacob Rosenberg (1), Ismail Gögenur (1)

(1) Department of Surgery, Herlev Hospital, University of Copenhagen, Denmark
(2) Department of Breast Surgery, Herlev Hospital, University of Copenhagen, Denmark
(3) Psychiatric Center Copenhagen, Rigshospitalet, University of Copenhagen, Denmark
(4) Department of Anaesthesia, Centre of Head and Orthopaedics, Rigshospitalet, University of Copenhagen, Denmark

Abstract

Purpose: To investigate whether administration of an oral dose of 6 mg melatonin before bedtime in the peri-operative period of breast cancer surgery could reduce sleep disturbances measured by actigraphy.

Methods: A double-blind, placebo-controlled, randomised clinical trial where patients were received 6 mg melatonin or placebo approximately 60 minutes before bedtime three nights preoperatively until at least one week postoperatively. Participants were monitored in the entire period with actigraphy and were instructed to complete visual analogue scales (VAS) for sleep, pain, general well-being, fatigue and Karolinska sleepiness scale each morning.

Results: Administration of 6 mg oral melatonin approximately 1 hour before bedtime significantly increased sleep efficiency with 4-5% (P=0.016) and reduced wake after sleep onset with 15-26 min (P=0.035) the entire first postoperative week. The changes in sleep efficiency and wake after sleep onset persisted to approximately two weeks postoperatively before the histology answer (P=0.028 and P=0.025, respectively). Melatonin administration also significantly reduced the anxiety level with 15 mm on a VAS (P=0.019) before the histology answer approximately two weeks after surgery. No other differences were found between the groups for objectively determined sleep in the sleep or wake period during the peri-operative period.

Conclusions: Melatonin increased sleep efficiency and reduced wake after sleep onset in the immediate postoperative period as measured by actigraphy. Furthermore, melatonin reduced anxiety levels before the histology answer approximately two weeks postoperatively. Future studies on melatonin administration in patients with breast cancer and other cancer populations are warranted.