

The Effects that Corticosteroids, prednisone and dexamethasone, have on Human Sleep after Short-term Usage



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INTRODUCTION

- Corticosteroids are commonly used to reduce inflammation and suppress the immune system.
- There are two more common types of corticosteroids, prednisone and dexamethasone, that are generally prescribed, and our research is focused on the side effects they have on human sleep in the short-term. This is about several months of consistent usage.
- Prednisone and dexamethasone vary in their strengths, but both have a similar effect when treating arthritis, allergies, asthma, as well as some cancers.

OBJECTIVES

- Through our research, we hope to find a solution to combat the negative effect that corticosteroids have on sleep qualities and rhythms

METHODS

- Databases such as Google Scholar and the Michael Swartz Database were used to find scholarly peer reviewed sources pertaining to our topic.
- We used keywords like "Prednisone," "sleep quality," and "corticosteroids" were used to find the sources.

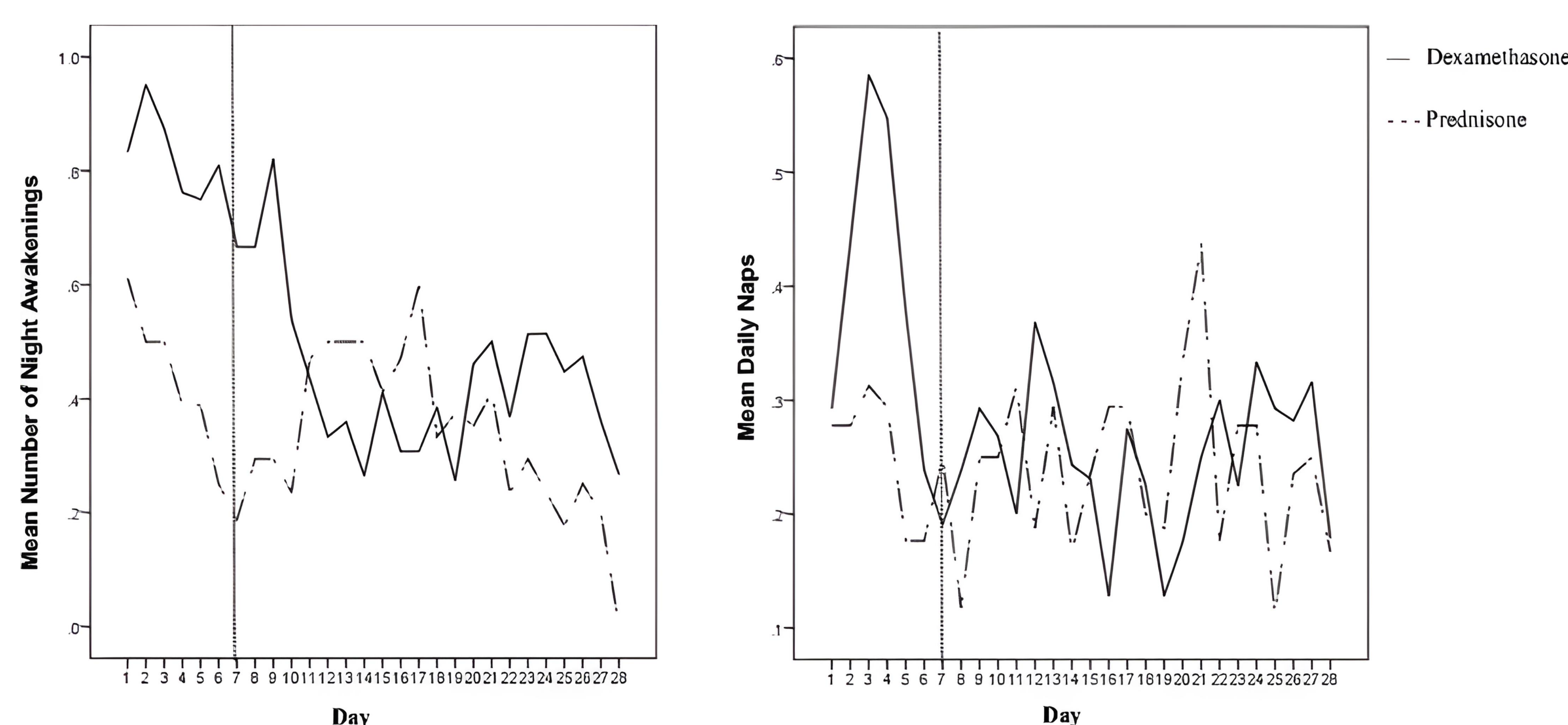


Figure 1. Night awakenings and daily naps by steroid. Vertical dotted line at day 7 indicates end of steroid period (Daniel)



RESULTS

- The mechanisms by which corticosteroids affect sleep are not yet fully understood, but it is thought that they interfere with the body's natural circadian rhythms, disrupting the timing of sleep and wakefulness. (Daniel)
- The results have shown that chronic use of prednisone and dexamethasone can disrupt sleep architecture and reduce sleep efficiency, resulting in decreased overall sleep duration and poor sleep quality (Reynolds)
- A study was done on 81 children ages 3-12 that are in therapy for ALL, and 61 parents returned sleep journals and measures of HRQL
- Every child that returned a sleep journal experienced sleep disturbances
 - Prednisone: decreases melatonin levels and alters cortisol levels, which increase blood sugar and energy levels, leading to a disruption of the diurnal rhythm (MedicalNewsToday)
 - Dexamethasone: a known side effect is insomnia (UK National Health Services) resulted in more sleep disturbances and night awakenings than prednisone, along with poorer sleep quality and napping (Daniel)
- Patients who use these medications for extended periods may experience frequent nocturnal awakenings, increased daytime sleepiness, and fatigue. (Reynolds)
- Studies also show that extended sleep deprivation caused by these medications can affect cell proliferation and adult neurogenesis and produce similar results as would be seen from stress.

CONCLUSIONS

- Corticosteroids can have negative effects on sleep, including insomnia and disrupted sleep patterns.
- Dexamethasone has more strong effect on cortisone production on sleep when in comparison prednisone
- However, there are several strategies that can help to reduce these effects. These include taking corticosteroids in the morning, practicing good sleep hygiene, exercising regularly, and seeking medical advice if necessary.
- By implementing these strategies, individuals can potentially minimize the impact of corticosteroids on their sleep and improve their overall health and well-being.



FUTURE WORK

Since melatonin is not typically advised along with prednisolone and dexamethasone, in the future the effects of Ramelteon, a newer sleep-inducing hormone, should be tested and studied to find whether it can complement or counter the effects of these corticosteroids.

References

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