

RISKS OF INCORRECT ADMINISTRATION OF DEXAMETHASONE

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Introduction

Despite the significant benefits of dexamethasone (synthetic analogue of cortisol), incorrect administration can cause serious side effects.

Purpose

The aim was to enumerate what side effect can be caused by incorrect use of this drug.

Material and methods

The information was selected from articles and publications from databases.

Keywords

Dexamethasone, overdose, cortisol, side effects

Results

One of the most common type of incorrect use is overdose. Besides chronic treatment, the side effects are similar with Cushingoid symptoms. Taking dexamethasone at late hour can cause insomnia, as it inhibits the production of melatonin. Thus, this affects the circadian rhythm of glucocorticoids and melatonin release (Fig 1). Moreover, irregular doses disbalance the hypothalamic-pituitary-adrenal axis, which may be associated with maladaptive stress response. In order to maintain the circadian rhythm, it is necessary to use the drug in the morning

Dexamethasone supresses immune system by inhibiting macrophage and T-cell activity and antibody production. Thus, it is not recommended to take vaccines during drug therapy. Speaking of therapy, some pills like NSAIDs, birth control pills, antibiotics, blood thinners must not combine with dexamethasone because it will make the treatment less effective or increase the risks of side effects.

Long-term therapy can lead to memory loss and, sometimes, dementia. It increases glutamate concentration, leading to hippocampus disfunction and brain atrophy. On the other hand, the same increase of glutamate, but in prefrontal cortex (Fig. 2), can cause depression, behaviour issues etc.

Conclusions

In order to avoid the side effects of dexamethasone, the patient must follow the use regimen and the doctor's indications. The best hour to take dexamethasone safely is in the morning.

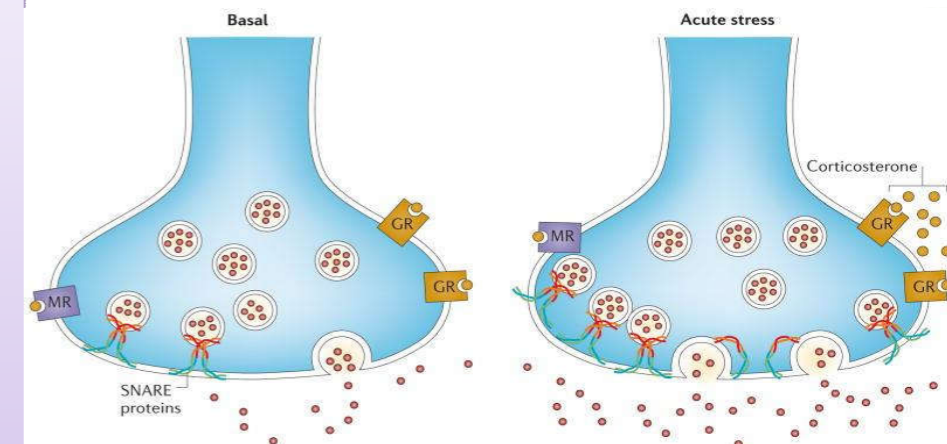


Fig.2. Glutamate release comparison between normal state and stress (in prefrontal cortex)

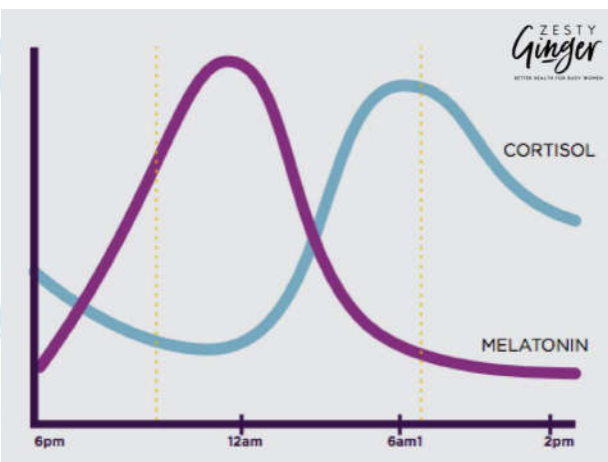


Fig.1. Circadian rhythm of cortisol and melatonin