

## The influence of respiratory drugs on mood and behaviour.

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### Introduction

Respiratory drugs are a class of medications that are used to treat respiratory conditions such as asthma, Chronic Obstructive Pulmonary Disease (COPD) and other respiratory disorders. These drugs primarily target the respiratory system to alleviate symptoms like shortness of breath, wheezing and coughing. However, many of these drugs can also affect the Central Nervous System (CNS) and the brain, leading to several side effects [1, 2].

Bronchodilators are medications that relax the smooth muscles of the airways, thereby opening up the air passages and improving airflow to the lungs. They are commonly used to treat conditions like asthma and COPD. Bronchodilators can be divided into two categories: beta-agonists and anticholinergic. Beta-agonists stimulate the beta-receptors in the lungs, which results in the relaxation of the smooth muscles and the opening of the airways. Some examples of beta-agonists include albuterol, salmeterol and terbutaline. These drugs can also affect the CNS by crossing the blood-brain barrier and stimulating the beta-receptors in the brain. This can lead to side effects like tremors, anxiety and nervousness [3].

Anticholinergic, on the other hand, block the action of acetylcholine, a neurotransmitter that causes constriction of the airways. By blocking this neurotransmitter, anticholinergic can help to relax the airways and improve breathing. However, anticholinergic can also cross the blood-brain barrier and affect the central nervous system. Side effects of anticholinergic can include dizziness, confusion and blurred vision. Corticosteroids are medications that reduce inflammation in the airways. They are commonly used to treat conditions like asthma and COPD. Corticosteroids can be taken orally or inhaled and they work by reducing the production of inflammatory chemicals in the body. While corticosteroids are primarily designed to target the respiratory system, they can also have an impact on the brain and CNS [4].

Long-term use of corticosteroids can lead to a condition called Cushing's syndrome, which is characterized by a wide range of symptoms including weight gain, mood changes and cognitive impairment. This is because corticosteroids can affect the Hypothalamus-Pituitary-Adrenal (HPA) axis, which is responsible for regulating the body's stress response. Corticosteroids can also cause mood changes, including

depression and anxiety. In addition to these side effects, there is some evidence to suggest that corticosteroids can also affect the structure and function of the brain. For example, studies have shown that long-term use of corticosteroids can lead to changes in brain structure, including a reduction in the size of the hippocampus, a brain region that is critical for memory and learning. Corticosteroids have also been shown to affect neurotransmitter systems in the brain, including the serotonin and dopamine systems [5].

### Conclusion

In conclusion, respiratory drugs can have an impact on the brain and CNS. Bronchodilators can stimulate beta-receptors or block acetylcholine, which can lead to side effects like tremors, anxiety and confusion. Corticosteroids can affect the HPA axis, leading to mood changes and cognitive impairment and can also affect brain structure and neurotransmitter systems. It is important for healthcare providers to be aware of these potential side effects and to monitor patients who are taking respiratory drugs for any signs of CNS or brain-related symptoms.

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