

Asthma and sleep

Poor quality sleep and sleep disturbance is common among older people with asthma. Impaired sleep quality correlates with worse asthma control and quality of life. Obstructive sleep apnoea (OSA) appears to be significantly more common in people with asthma than those without asthma.

Asthma

Asthma is a chronic inflammatory condition of the lungs, with airflow obstruction and airway hyper-responsiveness. Symptoms include recurrent episodes of wheeze, cough, breathlessness, and chest tightness. Airflow obstruction is reversible either spontaneously or with treatment.

Older people experience more severe asthma and are at a higher risk for asthma-related morbidity and mortality. In 2022, there were 467 deaths recorded from asthma. Women aged 75 and above were most at risk, with 45% of deaths from this age group.

Nighttime symptoms of asthma are a sign of poor asthma control. Airway inflammation, the hallmark of asthma, may worsen at night. Bronchial hyper-responsiveness (BHR) increases overnight, potentially exacerbating nocturnal asthma symptoms. Nocturnal breathlessness and wakefulness induce sleep deprivation, anxiety and poor quality of life.

Most adults with asthma require regular maintenance therapy with inhaled corticosteroids (ICS), alone or in combination with long-acting bronchodilators (LABAs). The Australian Asthma Handbook recommends as-needed low-dose budesonide-formoterol (*Symbicort, Rilast, DuoResp, BiResp*) or regular daily low dose ICS plus a SABA reliever as-needed for symptoms. If asthma is not controlled, the next step is low dose ICS-formoterol maintenance and reliever therapy (*Symbicort, Rilast, DuoResp, BiResp, Fostair*) or regular daily maintenance ICS/LABA plus a SABA reliever as-needed for symptoms.

Over-reliance on short-acting bronchodilators such as salbutamol (*Ventolin, Asmol, Zempreon*) increases the risk of severe exacerbations or flare-ups and increases the risk of death from asthma.

Sleep disturbances

Sleep disturbances and insomnia in older people with asthma are common. At least one-third of people with asthma have clinically significant insomnia, which has been associated with worse asthma symptoms, poor quality of life and increase asthma-related healthcare utilisation.

Quality of sleep in older people with asthma is poorer compared to those with chronic obstructive pulmonary disease (COPD) or chronic bronchitis. Respiratory-related sleep disturbances may contribute to several common cardiovascular and metabolic disorders.

Sleep disturbances with asthma may include difficulty falling asleep, night-time awakening and early awakenings. There may be a reduction in slow wave sleep (non-REM deep sleep) and reduced sleep efficiency.

Up to 50% of adults with asthma experience excessive daytime sleepiness. Daytime sleepiness can impact on cognition and daytime functioning.

People with asthma and insomnia are significantly more likely to have moderate to severe depressive symptoms than those without insomnia.

Sleep disturbances are associated with uncontrolled asthma. However, sleep disturbances can also occur in people with well-controlled asthma. Studies have shown that 10-20% of people with well-controlled asthma still have poor sleep quality.

Sleep apnoea

OSA is characterised by brief repeated episodes of breathing cessation (apnoea) or a marked reduction in airflow (hypopnoea) during sleep. Symptoms of OSA such as snoring and witnessed apnoeas are common among people with asthma.

Asthma is a risk factor for OSA and OSA is an independent risk factor for asthma exacerbations. Disruption of sleep architecture with repeated nocturnal asthma attacks increases the risk of OSA. OSA is associated with inflammation of both the upper and lower respiratory tracts. Increased vagal tone during episodes of apnoea can trigger nocturnal asthma attacks.

There is an increased prevalence of OSA among people with asthma, particularly in those with severe asthma and difficult-to-control asthma. It is estimated that up to 50% of people with asthma experience OSA. Daytime sleepiness and fatigue can occur with untreated OSA, resulting from both hypoxia and fragmented sleep.

Underlying OSA may contribute to worse asthma control. Use of oral corticosteroids such as prednisone or prednisolone commonly causes weight gain, potentially worsening both asthma and OSA.

Treatment of OSA with continuous positive airway pressure (CPAP) may lead to improved asthma control and asthma-specific quality of life.

Nocturnal CPAP may also be of benefit to asthmatic patients without OSA, potentially because of stretching of airway smooth muscle.

Suppression of increased vagal tone associated with OSA with inhaled muscarinic antagonists (LAMAs) reduces early morning falls in peak expiratory flow and protection against nocturnal asthma symptoms.

Rhinosinusitis

Rhinosinusitis and allergic rhinitis (hayfever) commonly occur with asthma. These conditions contribute to poor sleep quality in asthma. The nose is the preferred breathing route during sleep and nasal obstruction contributes to sleep disordered breathing.

Rhinosinusitis and chronic sinusitis also contribute to upper airway obstruction in OSA.

First-line therapy for chronic persistent allergic rhinitis and rhinosinusitis is intranasal corticosteroids (INCS), alone or in combination with antihistamines. Combination intranasal corticosteroid/antihistamines are available (*Dymista Allergy, Ryaltris*).

Anxiety-depression

Anxiety and depression are also common among people with severe asthma, having a negative impact on sleep.

Co-existence of insomnia and depression may significantly impair ability to perform activities of daily living among older adults with asthma, particularly transferring or getting in and out of bed, and dressing. Impaired ability to ambulate, toilet, and bathe can lead to accidental falls.

Optimally treatment insomnia and depression in older adults with asthma may help preserve daily function. Cognitive behavioural therapy for insomnia (CBT-I) should be considered in addition to psychological and pharmacological treatments.

Reflux

Gastro-oesophageal disease (GORD) may coexist in people with asthma, impacting negatively on sleep quality. The prevalence of GORD is increased in people with OSA, occurring in up to two-thirds of people. Obesity contributes to the same risk factors for GORD and OSA.

Treatment in people with GORD symptoms includes use of proton pump inhibitors (PPIs), such as esomeprazole, lansoprazole, omeprazole, pantoprazole, and rabeprazole. Treatment with PPIs can reduce nocturnal symptoms of asthma, reduce asthma exacerbations, and improve quality of life.

Summary

Asthma, sleep and sleep disorders appear to have complex, but significant relationships, particularly among people with severe asthma. Asthma is associated with decreased quality of sleep, difficulties falling asleep, sleep fragmentation, early morning awakenings and increased daytime sleepiness. Disturbed sleep is associated with poor control of asthma. Optimising asthma control with inhaled corticosteroids can improve sleep quality.

References

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