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Diabetes and sleep disorders

Many older people experience a significant decline in sleep quality. Type 2 diabetes and obesity are linked in many ways to sleep problems. Nightly hypoglycaemia, neuropathic pain and nocturia may contribute to the development of sleep disorders among people living with type 2 diabetes. Sleep disorders may increase the risk of developing diabetes complications.

Healthy sleep is considered a key component of good diabetes management. Sleep health is an important and modifiable risk factor for improving glycaemic control in people living with type 2 diabetes.

Diabetes prevention

Managing and treating sleep disorders may play an important role in the prevention of type 2 diabetes. People with insomnia have a 16% higher risk of developing type 2 diabetes than people without insomnia. Disturbance in the quantity, quality and timing of sleep are associated with an increased risk of obesity and impairments in daytime functioning and glucose metabolism.

Depression, low socioeconomic status, low levels of physical activity, and sleep disorders (including obstructive sleep apnoea and restless legs syndrome) are all associated with excessive sleep and are also risk factors for type 2 diabetes.

Both excessively short (less than 6 hours per night) and excessively long (more than 8 hours) sleep durations have been found to be associated with elevated risk of type 2 diabetes.

When compared with 7 hours per night, a reduction of 1 hour of sleep has been shown to be associated with a 9% increased risk of developing type 2 diabetes. Short sleep duration is also linked to an increased risk of progression from prediabetes to type 2 diabetes. Less than 6 hours sleep is linked to poorer health outcomes in people with diabetes, particularly higher HbA1c levels.

Conversely an increase of 1 hour of sleep has been shown to be associated with a 14% increased risk of developing diabetes.

Duration of insomnia is also a contributing factor: people with a duration of insomnia of less than 4 years been shown to have a 14% higher risk of developing type 2 diabetes, whereas those whose duration of insomnia was more than 8 years have a 51% increased risk.

Several factors increase the risk of diabetes in people with sleep problems. Short sleep duration is associated with increases in hunger, appetite, and energy consumption, which may lead to overweight or obesity and, in turn, insulin resistance.

Diabetes and insomnia

Sleep disorders are common in people with type 2 diabetes, negatively affecting health outcomes. Insomnia, obstructive sleep apnoea and restless legs syndrome (RLS) are more common in people with diabetes than the general population. Insomnia is four times more common than the general population and even higher in older people.

Too much or too little sleep disrupts glycaemic control on people with type 2 diabetes. Insomnia is associated with poorer control of HbA1c and fasting glucose.

Improving sleep quality and duration is associated with improvements in glycaemic regulation, glucose tolerance, insulin sensitivity, blood pressure, HbA1c, and lipid profiles.

Insomnia is also associated with depressive symptoms and increased mortality in type 2 diabetes.

Sleep apnoea

Obstructive sleep apnoea (OSA) is associated with an increased risk of type 2 diabetes. Around 15–30% of people living with obstructive sleep apnoea/hypopnoea syndrome (OSAHS) have type 2 diabetes.

There is a higher prevalence of OSA and OSAHS in people with type 2 compared to those without diabetes. Over half of people with diabetes (50-90%) have sleep apnoea. OSA is associated with poorer glycaemic control. Partial or total cessation of breathing caused by OSA impairs the quality of sleep and aggravates insulin resistance, hypertension and hyperglycaemia.

OSA is associated with microvascular complications such as diabetes retinopathy, neuropathy and nephropathy.

In addition, people with type 2 diabetes and OSA are more likely to develop coronary artery disease and heart failure.

Restless legs syndrome

The prevalence of RLS in people with type 2 diabetes ranges from 8% to 45%. RLS is also associated with a higher prevalence of diabetes retinopathy, neuropathy and nephropathy, as well as macrovascular complications of diabetes – coronary heart disease and stroke.

Periodic leg movement disorder (PLMD) is repetitive cramping or jerking of the legs during sleep. It is often linked with RLS. PLMD is associated with a higher prevalence of daytime somnolence in type 2 diabetes.

Management of sleep disorders

Treating sleep disorders could prevent diabetes progression and improve health outcomes and quality of life. Use of low-dose antidepressants and antipsychotics to manage sleep disorders may have metabolic adverse effects, increasing the risk of diabetes.

Conventional therapies such as weight loss, healthy diet, exercise within limits, sleep education and cognitive behavioural therapy for insomnia (CBT-I) seem to be effective in improving sleep and health outcomes in people with type 2 diabetes.

Z drugs and benzodiazepines should be avoided in older frail people with diabetes as they may impair glucose metabolism. Melatonin which can shorten sleep latency and prolong total sleep duration, may improve glycaemic control. Suvorexant (*Belsomra*) has been shown to improve sleep quality in people with type 2 diabetes after 14 weeks.

SGLT2 inhibitors used in the management of diabetes have been shown to reduce incident obstructive sleep apnoea in two large trials. Continuous positive airway pressure (CPAP) is the gold standard for treating OSA and has been shown to improve glycaemic control and reduce HbA1c. Weight loss is likely to have a positive benefit on OSA and type 2 diabetes.

Dopamine agonists such as pramiprexole (*Sifrol*), ropinirole (Repreve) and rotigotine (*Neupro*) are first-line therapy for RLS. Levodopa is also used in low doses at bedtime for RLS. Other pharmacological treatments for RLS, include opioids, benzodiazepines, gabapentinoids and iron therapy. Symptoms of restless legs and periodic limb movements of sleep/wakefulness get worse after treatment (augmentation) and symptoms may shift to an earlier time in the day and have greater intensity.

Summary

Type 2 diabetes mellitus is linked to sleep disorders and a decline in sleep quality. Sleep disorders are linked to the development of type 2 diabetes and increase the risk of developing diabetes complications. Counselling on sleep hygiene and improving sleep quality is an important part of diabetes management. Consistent, uninterrupted sleep for should the goal for people with type 2 diabetes.

References

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