MIND your BODY

Cover Story

Causes of nocturia

Joan Chew looks at the various reasons for frequent night-time urination

INCREASED URINE PRODUCTION

■ Ageing

The circadian rhythm of urine production ensures that the secretion of the anti-diuretic hormone – which balances the amount of fluid in the body – peaks at night.

So the kidneys reabsorb water, and urine output is 20 to 30 per cent that of the daily total output, said Dr Ng Lay Guat, head and senior consultant at the department of urology at the Singapore General Hospital.

But the elderly may lose this hormonal secretion at night, making their urine output about half of the total 24-hour output, resulting in frequent night-time urination.

■ Diabetes

Diabetes mellitus, in which patients are unable to produce or use sugar-controlling insulin effectively, can cause excessive urination.

People with poorly controlled diabetes mellitus have high levels of glucose in the body that the kidneys try to get rid of, said Dr Abel Soh, a consultant endocrinologist at the Raffles Diabetes & Endocrine Centre at Raffles Hospital.

But excess glucose in the kidneys draws water out of the body by osmosis, resulting in more urine.

Patients with diabetes insipidus cannot make enough or use the anti-diuretic hormone well.

As a result, the kidneys excrete large amounts of diluted urine.

Most patients with this condition will experience nocturia, Dr Soh said.

■ Kidney diseases

In some rare diseases, the kidneys do not respond to the anti-diuretic hormone and produce excess urine. This can result in nocturia.

Patients with kidney failure may have nocturia for a different reason. They may be prescribed drugs called diuretics, which make the kidneys excrete more water, giving rise to nocturia.

■ Heart disease

Those with heart failure tend to have problems with returning blood flow back to the heart, which tends to pool in the lower limbs and lead to swelling.

When these patients lie down to sleep, the effect of gravity is eliminated, so blood circulation to the heart improves. The sudden increase in the amount of blood in circulation results in more urine being produced, Dr Ng said.

■ Head injury

Dr NV Ramani, a consultant neurologist at the Raffles Neuroscience Centre at Raffles Hospital, said head trauma or brain surgery can impair the brain's production of the anti-diuretic hormone. This then increases urine production throughout the day.

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A person who is unable to fall asleep at night is likely to have a heightened awareness of the need to urinate.

REDUCED BLADDER CAPACITY

■ Benign prostatic hyperplasia

When the prostate enlarges, it presses against the urethra and may constrict the flow of urine, making the bladder work harder to empty urine, said Dr Colin Teo, the head and consultant at the department of urology at Khoo Teck Puat Hospital.

Over time, the bladder weakens and does not empty completely. With residual urine, the bladder fills up faster, giving rise to a more frequent urge to urinate, Dr Teo said.

■ Detrusor impairment

The muscle that makes up the bladder, known as the detrusor, weakens with age, so it cannot contract as strongly to fully empty its contents, said Professor Kesavan Esuvaranathan, head of the department of urology at the National University Hospital (NUH).

As the bladder always has residual urine, it fills up faster and the person needs more toilet visits.

■ Pregnancy

Dr Roy Ng, the head and senior consultant at the division of urogynaecology and pelvic reconstructive surgery at NUH said that from the second trimester, a woman's blood volume rises by 25 per cent due to hormonal changes. This and the growing foetus in the womb compress the bladder to shrink its functional capacity to below the normal 400 to 500ml, he said.

■ Pelvic organ prolapse

When the muscles that hold the uterus or bladder weaken and cause the organs to move out of place, the ability of the bladder to empty urine completely is affected, said Dr Roy Ng. A lot of residual urine will prompt more toilet visits.

■ Constipation

Constipation can cause urinary retention and frequency. The accumulation of stool in the rectum may also compress the urethra, so urine cannot be emptied completely from the bladder, leading to greater frequency of urination, said Dr Roy Ng.

■ Spinal cord diseases

The brain usually sends signals through nerves along the spinal cord to the bladder to relax its muscle.

But conditions such as spinal cord injury, a slipped disc or a tumour compressing the spinal cord may interfere with these signals.

These conditions result in the bladder muscle becoming taut and reducing the bladder size, and the patient passes urine frequently.

NEUROLOGICAL CAUSES

■ Overactive bladder

This may be caused by the bladder muscle sending strong signals to the brain to trigger a voiding sensation before the bladder is full.

The cause may be unknown, or a urinary tract infection, benign prostatic hyperplasia or prostatitis (infection of the prostate), said Dr Gerald Tan, a consultant urologist at Mount Elizabeth Novena Hospital.

■ Menopause

A drop in oestrogen levels results in the thinning of the lining of the urethra and vagina, making a woman more sensitive to a full bladder and prompting her to urinate more often.

SLEEP DISTURBANCES

■ Obstructive sleep apnoea

The nose and throat passages of sufferers of this condition become narrowed so they cannot breathe, said Dr Kenny Pang, an ear, nose and throat surgeon at the Asia Sleep Centre at Paragon.

They instinctively try to suck in more air into the lungs by creating negative pressure (vacuum) within the lungs, so air is transmitted through the throat. This results in choking and gasping during sleep.

This action pushes on the diaphragm, abdominal contents and bladder, jolting a person awake frequently to urinate, he added.

■ Insomnia

A person who is unable to fall asleep at night is likely to have a heightened awareness of the need to urinate, said Prof Kesavan.

Those with psychological illnesses, such as depression or anxiety, often experience insomnia.