

## Postherpetic neuralgia as a risk factor for classic heatstroke

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### Introduction

Cases of heatstroke are classified as either exertional or classic. Classic heatstroke occurs in old age or infancy but especially in the elderly [1]. They are more vulnerable to heat illness than younger people because of dysfunctional thermoregulatory mechanisms or medications. Individuals may incur an increased risk for classic heatstroke from a variety of physical conditions. In this report, we present a case of classic heatstroke in a patient with postherpetic neuralgia (PHN).

### Case report

A 74-year-old woman developed herpes zoster and, 6 months later, presented at our clinic with severe right axillary pain and a visual analog scale (VAS) score of 72mm. We diagnosed her condition as postherpetic neuralgia in the right Th 2–4 dermatomes. She also suffered from allodynia in the same area, which resulted in a dislike for air-conditioning because the airflow irritated the affected area. Treatment consisted of the oral administration of the antidepressant mianserin, 10mg, at bedtime and intercostal nerve blocks if necessary. During the first month, we administered amitriptyline. However, because of side effects such as drowsiness or hydrodipsia, amitriptyline was discontinued and mianserin was prescribed instead. After 2 months, the patient's VAS score stabilized below 40mm.

On one of the first hot days of summer (ambient temperature 33°C, relative humidity 78%) in late July, the patient took mianserin and slept as normal, without air-conditioning. Early the next morning, she was taken to the emergency room with an axillary temperature of 40.0°C, as a result of exposure to high ambient temperatures throughout the night. The patient vomited on the way to the hospital, and, on arrival, was found to be dehydrated and confused with the following clinical signs: a rectal temperature of 40.0°C; heart rate, 105/min; blood pressure, 90/50mmHg; and Glasgow Coma Scale, 13. From these clinical manifestations, her condition was diagnosed as classic heatstroke. She received external cooling and infusions of Ringer's lactate solution, and, by afternoon, her body temperature had normalized and she was conscious. Results of laboratory tests were normal except for slight hypokalemia and hypoglycemia. On the third day, she was able to walk unattended. On the tenth day, she was discharged from this hospital without sequelae.

### Discussion

PHN patients may have risk factors that result in an increased susceptibility to classic heatstroke. The majority of PHN patients are elderly [2], and their ability to regulate body temperature is less efficient than in younger people [1]. Numerous PHN patients also receive neuroactive agents, such as antidepressant drugs for pain relief. For example, amitriptyline, a serotonin reuptake inhibitor, is commonly prescribed. Unfortunately, some antidepressants have been implicated in drug-related heatstroke [3,4]. The balance of norepinephrine and serotonin in the preoptic-anterior hypothalamus controls the body temperature set point and may be responsible for short- and long-term thermoregulatory adaptive modifications of the shivering threshold [5]. Amitriptyline and mianserin can affect

the balance of norepinephrine and serotonin in the hypothalamus [6,7], which may further impair temperature regulation and thermal sensation in the elderly.

Many PHN patients suffer from allodynia as well. The pain is commonly precipitated by touch (mechanical allodynia) or thermal change (warm or cold allodynia) [2]. Some PHN patients dislike air-conditioning because even a weak airflow can produce pain. To avoid pain, they may tolerate higher ambient temperatures, either consciously or not. Questions remain as to whether allodynia or the sensory disturbance accompanying PHN at the affected area impairs temperature regulation directly. Allodynia, however, can prevent these patients from selecting safe environmental temperatures and thereby gives rise to heatstroke indirectly.

In summary, PHN may be an additional risk factor for classic heatstroke because many patients with PHN have risk factors associated with classic heatstroke including advanced age, antidepressant medication, and allodynia. We believe this to be the first report of heat-

stroke following PHN. Physicians should be aware that PHN patients require guidance on how to avoid heatstroke and maintain safe environmental conditions.

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