Focus on patient safety

MEASURING & IMPROVING QUALITY

Heatwaves: hospital inpatients and care facility residents

Cool patients off before they pay the price

28 March 2024

It could happen to you too

Event 1

DEHYDRATION RESULTING IN FUNCTIONAL KIDNEY FAILURE

During a heatwave, a patient in his seventies underwent laparoscopic colectomy surgery. While his return home was being considered, his general condition deteriorated. Acute kidney failure was observed with a serum creatinine level of over 800 µmol/L. The patient was transferred to the intensive care unit where fluid and electrolyte correction led to a rapid recovery of kidney function.

What happened? *Immediate cause*

Dehydration occurred.

Why did it happen? *Root causes, absent or deficient barriers*

- There was no protocol in place at the hospital for managing patients in the event of a heatwave.
- A shortage of air conditioning units in the hospital department exposed the patient to extreme heat.
- The heat resulted in an increase in insensible fluid losses (via sweating and breathing) in this patient.
- Monitoring of the patient's fluid intake and urine output was inadequate in a patient whose infusion line had been removed in a context of early rehabilitation.
- An episode of postoperative diarrhoea exacerbated the patient's dehydration.

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Event 2

FLUID AND ELECTROLYTE DISTURBANCES RESULTING IN READMISSION TO HOSPITAL

A patient in her seventies underwent laparoscopic surgery to remove ovarian cysts. Although the operation went well and the patient returned home, her husband brought her back to the emergency department a few hours after her discharge. There, severe temporo-spatial disorientation was observed, resulting in her immediate readmission.

What happened? *Immediate cause*

The patient developed dilutional hyponatraemia and hypokalaemia.

Why did it happen? *Root causes, absent or deficient barriers*

- A heatwave warning led to behavioural changes in the patient, who drank a very large quantity of water without eating, leading to dilutional hyponatraemia.
- The patient was on loop diuretic treatment, contributing to the hyponatraemia and hypokalaemia.
- The patient's laboratory test results were not checked before her discharge, meaning that abnormal levels were not detected.

Event 3

DEHYDRATION RESULTING IN DEATH

A patient in his sixties was hospitalised in a long-term care service for treatment of his schizophrenia. During a heatwave, he developed a fever, severe asthenia and oxygen desaturation. Despite appropriate treatment and transfer to a suitable unit, the patient died.

What happened? *Immediate cause*

The patient developed severe dehydration with a serum sodium level of 182 mmol/L.

Why did it happen? *Root causes, absent or deficient barriers*

- The heat resulted in an increase in insensible fluid losses (via sweating and breathing).
- The general context (Covid pandemic, heatwave) had led to a significant reduction in the number of medical staff on duty and difficult working conditions.
- The infrastructure (double room with inadequate ventilation, roller shutter not working) exposed the patient to the outside weather conditions.
- The patient:
  - did not follow his care plan and hydration recommendations;
  - had communication difficulties with nursing personnel due to his psychiatric illness;
  - had a persistent fungal infection in the mouth, despite treatment.
- There was an accumulation of monitoring and computerised care record traceability deficiencies:
  - medical observations were only carried out every two weeks and only consisted of vital signs. Despite a first episode of dehydration three weeks earlier, no new observation had been carried out since then;
  - information was transmitted on a separate written document;
  - there was no record of fluid monitoring on the patient's computerised chart.

Key words: ***heatwave – dehydration – hyponatraemia – hypernatraemia***

So it doesn't happen again

Climate change is causin – and will continue to cause increasingly frequent and intense heatwaves in France. Hospital inpatients (excluding hospital at home) and care facility residents are not impervious to heatstroke (hyperthermia), dehydration and hyponatraemia, which can have serious consequences. It is therefore essential that all healthcare professionals take action to limit the impact of heatwaves on these individuals.

Individuals need to be made aware by professionals of what to do in the event of a heatwave: drink at least 1.5 litres of water per day, eat a balanced diet with cold foods (to avoid hyponatraemia), wear appropriate clothing, apply water to the body and use a fan. They must be able to alert the care team at the first signs of thirst or heat-related discomfort, and ask for help if they are not self-sufficient. To be effective, awareness-raising must be carried out using a variety of communication media (posters, videos, braille documents, etc.).

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Professionals must take care to:

- identify the most vulnerable individuals: young children, the elderly, people with chronic conditions (including psychiatric) and/or disabilities;
- put in place specific hydration instructions, with appropriate monitoring protocols (especially for individuals who do not really feel the effects of heat or have difficulties expressing themselves) and ensure traceability. In care facilities, these instructions should be validated by the coordinating physician;
- cool and monitor the temperature of the premises: close shutters and windows, air at night, etc. If the temperature in the rooms is too high, take people to a "refuge zone" (cool room);
- detect and rapidly treat early signs of dehydration, heat stroke and hyponatraemia. Monitoring an individual's weight is a simple long-term monitoring measure;
- reassess the benefit-risk balance of medicinal products liable to affect the way the body adapts to heat, in accordance with French National Agency for Medicines and Health Products Safety (ANSM) recommendations. Do not give aspirin or paracetamol, which can aggravate potential kidney damage (dehydration) or liver damage (heat stroke);
- adapt proposed activities to temperatures.

Hospitals and care facilities should:

- prepare for heatwaves in advance, by working on the design and renovation of buildings and their environment and ensuring appropriate equipment is available;
- ensure thermometers used to measure the actual temperature of the premises, blinds, air conditioning, fans, etc. are kept in good working order;
- if the temperature in the rooms cannot be maintained at an appropriate level, provide a "refuge zone" to enable each individual to spend at least three hours per day in a cool room;
- develop and update crisis management plans. Define the respective roles of the different parties based on the risks identified. For care facilities, have a schedule and contact details for heatwave coordinators and physicians who can be called on if necessary;
- ensure they are kept informed of health alerts and trigger crisis management plans if necessary. Circulate the information to professionals, patients/residents and their families, user representatives, the social council, etc.;
- train professionals, raise their awareness and draw up specific protocols to address heatwaves.

→ **In the event of a heatwave, it is essential to keep people cool and well hydrated. The most vulnerable individuals must be the subject of specific monitoring. The role of each professional must be defined.**

Focus on patient safety collection

The "Focus on patient safety" collection aims to raise awareness among healthcare professionals as to risk management based on care-related adverse events that they have been confronted with and which are always associated with a series of dysfunctions. **The HAS does not modify or interpret these care-related adverse events reported by healthcare professionals in national care-related serious adverse event reporting databases and selected in patient safety focuses.**

The purpose of this Focus on patient safety is to illustrate some of the risks introduced as a result of climate change in France. It focuses especially on care-related adverse events occurring during a heatwave and is aimed at all professionals working in hospitals or care facilities and the patients or residents of such facilities. For this specific Focus on patient safety, the events are not described in their entirety and the analyses reported have focused on the root causes related to hot weather, in addition to the other usual root causes.

Find out more

Haute Autorité de santé. Reporting serious care-related serious adverse events [Online] 2022.

Haute Autorité de santé. Focus on patient safety [Online] 2023.

Haute Autorité de santé. Accreditation of physicians and medical teams [Online] 2020.

French National Agency for Medicines and Health Products Safety. *Le point sur vos traitements. Votre traitement en cas de fortes chaleurs. Dossier thématique* [Online] 2021.

Santé Publique France. *Fortes chaleurs canicule. Dossier thématique* [Online] 2024.

Île-de-France regional health agency *Mise en œuvre et suivi du plan « canicule » en Île-de-France* [Online] 2023.

French Ministry for Health, Youth, Sports and Associations "Heatwave" guidelines. Paris; 2010.

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