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EDITORIAL

Impact of large variations in the internal temperature of ambulances and their repercussions on patient safety

Impacto de grandes variaciones en la temperatura interna de ambulancias y sus repercusiones en la seguridad del paciente

Impacto das grandes variações de temperatura interna de ambulâncias e suas repercussões na segurança do paciente

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In 2024, it will be 25 years since the report "To Err is Human" was issued[1], published in 1999. From this milestone, we identified important advances in patient safety in hospital environments, which are widely presented and disseminated in the world's scientific literature. However, when we approach health care provided in ambulances, both in inter-hospital transport and in mobile pre-hospital care, a modest number of scientific and normative publications deal with these care scenarios, which are considered major healthcare risks[2].

Among the various topics neglected in discussions about safe care in ambulances are the control and monitoring of the internal temperature of these units. Conditions that we need to consider, since Brazil is a tropical country and has been suffering heat waves that, at times, exceed the thermal sensation of 60°C in several cities and regions, causing health imbalances, severe dehydration, arrhythmias heart disease, in addition to other repercussions.

In Brazil, the Brazilian Association of Technical Standards (NBR 14561:2000) sets the minimum conditions required for the design, construction, and performance of vehicles to respond to medical emergencies and rescue, establishing careful specifications and parameters aiming to provide a degree of standardization in vehicles emergency and rescue[3].

Among its specificities is the standardization of the internal temperature of ambulances which establishes that: "All vehicles must be equipped with heating and ventilation systems that can be operated collectively and an air conditioning system, using external ambient air or recirculated to maintain the interior temperature between 20°C and 26°C, considering an external temperature of - 18°C to 35°C". It is clear, however, that the regulations did not consider external temperatures above 35°C, as happens in Brazilian capitals, such as Rio de Janeiro, Cuiabá, Goiânia, and Campo Grande, which can exceed 45°C during the year[3].

Several authors consider that temperature is the most important factor involved in the degradation of pharmaceutical products. As the temperature increases, chemical degradation increases, with humidity being another major factor that affects the stability of products, which may be related to the effects of temperature variations. The adhesion and absorption of water to the surface of the pharmaceutical product can change its physical state and affect its reactivity, generating indirect degradation, to which the oxidation reaction, which is catalyzed by both light and temperature, generates the degradation of pharmaceuticals[4].

During pre-hospital care, fluctuations in temperature, humidity, and light become inherent and interrelated elements to the conditions in which the vehicle is located, the characteristics of the route during transport, and the region in which the work is carried out. The team of professionals who man the ambulances, especially the nurses, have the difficult daily task of checking whether the medicines and solutions that are stored inside the ambulances are intact, however, few studies prove the real degradation of the ambulance - solutions and medicine regarding the effects of temperature variations. In addition to the risks related to drug administration, another exposure related to high temperatures consists of the proliferation of bacteria in ambulances.

In a study whose objective was to identify microorganisms through microbial cultivation inside ambulances, it was found that, of the fifty-two samples collected in

these mobile units, thirty-one (59.6%) tested positive for some type of bacteria. Consequently, increasing the probability of Healthcare-Associated Infection in this scenario[5].

It can be inferred, therefore, that patient health care in pre-hospital care demands attention and strict control over the conditions to which patients are subjected, the devices and drugs found inside the mobile units.

Alerting health professionals about problems relating to the safety of patients who use ambulance services in Brazil becomes elementary, with a view to the search for best practices and the best evidence for safe and adequate care for the population.

It is concluded, therefore, that the role of professionals working in mobile pre-hospital care must be aligned with best health practices. Attention related to variations in the internal temperature of mobile units must be a continuous concern, a way in which we can invest in good clinical practice, in the expansion of studies that reveal best practices, and in the guarantee of harm-free care for the population who uses these services.

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