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Immunohistochemical analysis for the evaluation of agonal time in a clandestine migrant's death and forensic implications

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We report a case of an **adult migrant** without identification who, during an illegal **travel** with other 16 clandestine compatriots in a **bus** inside a **ship** landed from the **port** of Igoumenitsa and directed to Ancona, dead of a **heat stroke**. Before arrival of the ship in the port, all clandestine migrants were found in precarious **health** conditions by a crew member of the shipping company inside the bus; one man was found in a **dying** state outside the bus, on the floor of the nursing anteroom of the ship (**Fig. 1**). Circumstantial data revealed that one of them, the organizer of the illegal trip, impeded the **escape** of all the others migrants from the bus although the lack of **oxygen**. For judicial purposes and to demonstrate the **crime** of failure to assist a person in danger, it was useful to prove **if** the **death** of the man was preceded by a long agonal time (T). Specific analysis of immunohistochemical expression of **inducible nitric oxide synthase (iNOS)** in **smooth muscle cells** in a section of right **renal artery** (**Fig. 2**) testified a protracted T , in accordance with necroscopic findings and testimonial evidence. A **quantitative analysis** to measure the signal **intensity (SI)** from **cytoplasm** was performed using a computer-aided drawing program, **ImageJ software**. Finally, for the **estimation** of agonal time (T), the following statistical formula was applied: $T = \{\exp [-0.05 \times SI + 10.149] [1]$. T corresponded to 269 minutes, with a **standard deviation** of ± 14 minutes. All these **elements** were crucial to define the **role** of the migrant who arranged the crossing. The model of iNOS expression for estimation of T is useful in the field of clandestine migrant's deaths.

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Keywords

Illegal immigration; Agonal time

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