



## Pathology Biology Section - 2012

### **G110 Hypostasis and Time Since Death: State of the Art and Proposal of an Operative Instrumental Protocol**

*Francesco Vinci, MD\*, Sabrina Leonardi, MD, Maricla Marrone, MD, Maria Carolina Romanelli, MD, Rossana Gianciotta, MD, Pasquale Beltempo, MS, and Alessio Veneziani, MD, Section of Legal Medicine, piazza Giulio Cesare, 11, Bari, 70124, ITALY*

After attending this presentation, attendees will understand that in evaluating time since death the study of parameters derived from the three abiotic signs (hypostasis, rigor mortis, and body cooling) is still the most commonly used in practice. This is due to its simplicity and rapid execution and because it allows immediate deductions to be made at the crime scene, thus rapidly orienting the investigations. However, some of these methods, especially the evaluation of hypostasis, are highly subjective, being largely based on the personal experience, skill and scientific knowledge of the operator. This makes standardization very difficult and the final result may not be entirely satisfactory in estimating the time of death, as compared to witness reports and circumstantial data, that are sometimes very accurate.

This presentation will impact the forensic science community and society. Infact, it is known that the lividity that occurs after death has certain qualitative and quantitative features, but although these findings can contribute to estimate the time of death, the evaluation is still subjective and other parameters are often more accurate. For this reason, a standard method for studying hypostasis to estimate the time of death is needed.

An extensive volume of “archeological” references, covering a period since 1700, in which hypostasis was underestimated as a medicolegal phenomenon will be analyzed. Initially, it was considered only to prevent misdiagnosis of death. Then various authors set chronological limits for the appearance of lividity. Since then, changes of hypostasis characteristics have always been used for a basic orientation in evaluating the postmortem interval. The main problem is that several external and internal factors, often difficult to recognize, can affect the evolution of the phenomenon, in relation to conditions that change the qualitative and quantitative status of blood. Only in the 1930s was the advisability of “testing” hypostasis “mobility” suggested, although it was never specified exactly how to perform these operations. The small evidence provided in this regard is evidently based on personal experience and it is therefore difficult to propose these “guidelines” in concrete cases to pathologists with little practice and experience.

A test of hypostasis as it is usually done in daily practice was performed. A map of the back of the body regions, where hypostasis appears if the body is in supine position, was made. A questionnaire was administered to 35 experts and residents training in forensic medicine. The results of these tests confirmed that no standardized method is used in daily practice, although the population sample consisted of coroners coming from the same school. Then, some internal, external, or subjective factors were considered (cause of death; ambient temperature; humidity; anatomical site to test; intensity and duration of the compression; assessment of color intensity), that can cause variations in hypostasis formation and evolution. These factors and their incidence in the evaluation are the basis of this experimental study, based on measurement of these same parameters using specific equipment (a colorimeter, a dynamometer, and a thermometer set also for moisture measurement) selected for its ease of use.

In conclusion, the results of this research are illustrated and discussed. They show that in time since death evaluations based on hypostasis, a more objective method is needed. It must be remembered that many factors may invalidate the most accurate analysis made using traditional parameters.

**Hypostasis, Standardization, Time Since Death**