G9 Does a Draft Really Influence Postmortem Body Cooling?

Michal R. Kaliszan, PhD, Medical University of Gdansk, Debowa 23, Gdansk, 80-286, POLAND*

After attending this presentation, attendees will become familiar with the process of body cooling after death in various body sites, conditions which could influence this process, and the estimation of the Time Of Death (TOD).

This presentation will impact the forensic science community by showing the possibility of estimation of the TOD by measuring the *postmortem* temperature of the eye together with the analysis of the body cooling process in different environmental conditions, including still air and the presence of draft in the experimental room.

The *postmortem* body temperature decrease is a key factor in determining the time of death in humans and temperature-based methods of the TOD estimation are deemed to be most precise during the first several hours after death. The study focused on verification of the significance of the effects of airflow (draft) present in the room where the corpse is found, on the cooling process of specific body sites, and hence on determination of the TOD. The study was carried out in pigs. The investigations were commenced 75 min after the pigs had been killed and involved computerized recording of the cooling process of the eyeball interior (the vitreous humour), soft tissues of the orbit, muscles, and the recta, measured with thermal pin probes. The first part of the study was performed in still air; the second, with airflow generated by air conditioners and a fan.

The data was processed with Matlab® Software version 7.0. The estimation was done via the least squares method implemented in Matlab's *nnlinfit* function. The precision of the parameters estimated was assessed by calculating the coefficient of variation (% CV) using the *nlparci* function. The influence of air flow on the cooling rate and the initial temperature was tested comparing the individual estimates of the cooling rate in the first and the second part of the study. A t-test was performed to test the hypothesis that individual estimates of cooling rate with and without air flow are independent random samples from the same normal distribution with equal mean and variance. Additionally, the relative difference (RD) was calculated as a difference between the mean individual estimates of both parts of the study divided by the value of the first part of the study to assess the magnitude of the difference between the parameters. It was demonstrated that the moderate airflow (draft) present in the experimental conditions did not significantly affect the course of cooling of the investigated body sites. Despite moderate wind generated in the room, it appeared that the air movement close to the pigs bodies was in fact minimal. Therefore, in order to evaluate the TOD most precisely, one should first have reliable data on the actual velocity of air in the direct vicinity of the body rather than relying on the subjective sensation of the air velocity and using various unnecessary corrective factors.

Time of Death (TOD), Postmortem Body Cooling, Draft

 ** Presenting Author*