G54 Toxicological Implications in Heat Related Deaths in Phoenix, Arizona: Case Reports From the Office of the Medical Examiner

Kimberly McCall-Tackett, BS, Maricopa County, Forensic Science Center, 701 West Jefferson Street, Phoenix, AZ 85050; Ann L. Bucholtz, MD, 6643 East Sweetwater Avenue, Scottsdale, AZ 85254; Amy L. Lais, BS, Maricopa County Forensic Science Center, 701 West Jefferson Street, Phoenix, AZ 85007; and Norman A. Wade, MS, Office of the Medical Examiner, Forensic Science Center, 701 West Jefferson Street, Phoenix, AZ 85007*

After attending this presentation, attendees will be afforded a three year review of the statistics, toxicology, and pertinent scene findings associated with heat related deaths in the metropolitan Phoenix area.

This presentation will impact the forensic community by raising awareness of this public health issue.

The diagnosis of a heat related death rests on the importance of considering all factors involved for certifying the death when a person is found dead in a hot environment that can routinely be greater than 105 degrees during summer months. In recent years, media scrutiny of the number of deaths related to hyperthermia has reached headline proportions in our area, which has prompted much public awareness and activism. Although these headlines are accurate in reporting deaths have occurred, they do not typically reflect the true circumstances surrounding the deaths. This paper will discuss the headlines versus factual findings, retrospectively demonstrate the statistics, and discuss an algorithmic approach to unify the certification for more accurate compilation of county health statistics. Data was collected from May 1st to September 30th for years 2005 and 2006 (2007 data is still being collected). During this 2 year period, 168 deaths were certified as heat related. Of these deaths, 52 % (87) had negative toxicology findings and were attributed to heat only. Of the remaining 48% (81 cases): 14% (24) had positive toxicology screens for ethanol, 16% (25) had positive screens for stimulants (cocaine or methamphetamine), 5% (8) were positive for psychotropic drugs, and 14% (24) had positive results for more than one these categories. Toxicology also plays a vital role in electrolyte determinations. The levels of sodium, creatinine, and urea nitrogen must be considered, if possible, when evaluating potential heat related deaths. In conclusion, vitreous analysis, scene variables, and decomposition all affect the ability to evaluate results. The relevance of these findings in conjunction with other variables used to make the diagnosis will be discussed. The proposed algorithm will assist with the information gathering process and aid the forensic investigation by promoting categories for the deaths to be cataloged, so more accurate statistical, epidemiological and community prevention measures can be instituted. This retrospective analysis will demonstrate the multiple factors used to make a diagnosis of a heat related death and elicit common problems encountered in evaluating a decomposed body in a potentially hot environment. From these findings, an algorithmic approach will be proposed to further define the cause and manner of death in future investigations and improve public health reporting. It is hypothesized that the cause and manner of death could be more definitively diagnosed by using a more uniform information gathering process at the scene, during the autopsy examination and from the toxicology findings. Specific case findings and circumstances will be discussed.

Hyperthermia, Toxicology, Death

 ** Presenting Author*