G85 Association of Chronic Methamphetamine Use and Idiopathic Pulmonary Arterial Hypertension

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After attending this presentation, attendees will gain insight into the prevalence of pulmonary hypertensive changes in a metropolitan methamphetamine/amphetamine user population, and learn the implications of this finding on cause and manner of death determination.

This presentation will impact the forensic science community by evaluating the association between methamphetamine/amphetamine use and the development of idiopathic pulmonary hypertension (IPAH) in the forensic setting and increases awareness of this potential relationship in the forensic community. Identification of increased rates of IPAH among methamphetamine users would provide the forensic community with further insight into a potential mechanism of death in this population, especially in autopsies showing minimal cardiac and cerebral pathology, very low methamphetamine levels in the blood, or in cases with only anecdotal evidence of methamphetamine use and no other identifiable cause of death. Additionally, identification of IPAH in decedents with no known risk factors might suggest the need for additional toxicological studies to include evaluation for exposure to amphetamines/methamphetamines or other stimulants. In the clinical setting, knowledge of the increased risk for IPAH among methamphetamine users would alert physicians to consider this disorder as well as to screen for amphetamine/methamphetamine use in IPAH patients with no identifiable risk factors.

Increased rates of amphetamine use are reported among IPAH patients with no other risk factors. Indeed, one study found that patients with pulmonary hypertension and no recognizable risk factors were 10 times more likely to have a history of stimulant use than patients with known risk factors. Methamphetamine was the most commonly used substance among IPAH patients in this study. Case reports of IPAH in association with illicit stimulant use, including methamphetamine and cocaine, have recently been published. Additionally, there are some reports in the literature suggesting a link between fatalities associated with stimulant use and IPAH. To date there is minimal data linking the development of IPAH to chronic methamphetamine use and even less published on the gross and histologic findings of pulmonary arterial hypertension at autopsy.

The pathologic effects of chronic methamphetamine use are incompletely understood. Given the similarities between cocaine and amphetamines in mechanism of action, it is plausible that methamphetamine and cocaine users would develop similar cardiopulmonary sequelae. There are many reports describing the cardiac and cerebral effects of methamphetamine. In contrast, there is limited discussion in the literature on pulmonary pathology in chronic methamphetamine users. Most reports have highlighted the association of methamphetamine with acute pulmonary edema and/or development of pneumonia; very few studies have specifically evaluated for histologic changes of IPAH in methamphetamine fatalities. There are, however, multiple reports of pulmonary hypertension in association with prescription amphetamine use, and methamphetamine likely produces some of the same adverse effects as prescription amphetamines.

The case records of Office of the Medical Examiner, City and County of Denver identified 166 deaths where methamphetamine was detected and 10 deaths with amphetamine alone detected on toxicological screen. The gross and histologic findings of these cases will be evaluated retrospectively to determine if evidence of IPAH is present. Correlation with the cause and manner of death, toxicological analysis, and where possible the length of use and route of administration of methamphetamine and/or amphetamine use will be discussed. Where available, medical records will also be reviewed for evidence of a prior history of pulmonary disease, specifically IPAH. The proposed mechanisms for the development of arterial changes in the lungs will be discussed.

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 ** Presenting Author*