



Pathology/Biology Section - 2016

H100 Lung Weights in Deaths Due to Drug Intoxication

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After attending this presentation, attendees will better understand that a finding in deaths due to drug intoxication is increased lung weights. In the course of comprehensive death investigations, lung weights are valuable to determine if the death was due to the toxic effects of drugs. Lung weights are not valuable in determining the manner of death. In addition, this presentation will illustrate how certain factors such as age, presence of pneumonia, and resuscitation attempts affect lung weights.

This presentation will impact the forensic science community by providing additional indicators of death to consider in the investigation of deaths possibly due to drug intoxication.

A retrospective study of autopsy data to determine whether increased weights of the lungs can be considered a reliable supporter of drug overdose as the cause of death was conducted. In previous literature, normal lung weight at autopsy for men has been determined to be about 445g for the right lung and 395g for the left lung (840g total).¹ The lung weights for women are slightly lower at 340g for the right lung and 299g for the left lung.²

This retrospective study analyzed data from individuals whose deaths were caused by the toxic effects of drugs. The deaths occurred in 2014 in Michigan and totaled 133 deaths. The manners of death were classified as accidents (109 cases), suicides (15 cases), and indeterminate causes (9 cases). Resuscitation attempts were made on 27 of the individuals in the study and 16 individuals were found to have acute pneumonia (bronchopneumonia or lobar) on autopsy.

The average lung weight among cases examined were 700g for the right lung and 613g for the left lung (1,313g total). When compared to previous reports of normal lung weight, the lung weight of people who had died of a drug overdose is significantly higher. In addition, other factors that might contribute to the increase in lung weight and also support a diagnosis of death due to the toxic effects of drugs were identified. The average weight of lungs in which pneumonia was identified was greater than the average weight of lungs in the study population without pneumonia with 95% confidence in all lung weights for both gender groups. The same level of confidence (95%) was found in the lung weight of people who were resuscitated as compared to those who were not resuscitated. It should be noted that there was no statistical significance in lung weight between accidental deaths compared to deaths determined to be a suicide or indeterminate.

In conclusion, the nearly two-fold increase in average lung weight in these subjects compared to normal lung weight as reported in the literature suggests that drug overdose can be a cause of increased weights of the lungs. Conversely, an increased lung weight may be supportive of drugs causing the death as opposed to other competing factors. In addition, factors such as evidence of pneumonia and attempted resuscitation are associated with increased lung weight. An increased lung weight can be used as an indicator of death due to drug overdose, granted the presence of other pieces of evidence such as a history of drug abuse, toxicology levels, and scene paraphernalia.

Reference(s):

1. Molina, D. Kimberley, and Vincent J.M. Dimaio. "Normal Organ Weights in Men." *The American Journal of Forensic Medicine and Pathology* 33.4 (2012): 368-72
2. Molina, D. Kimberley, and Vincent J.M. Dimaio. "Normal Organ Weights in Women." *The American Journal of Forensic Medicine and Pathology* (2015): 1

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