G101 Autopsy Findings in the Morbidly Obese

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After attending this presentation, attendees will gain a more detailed understanding of the spectrum of pathological changes in persons with a body mass index greater than 35kg/m2 who have undergone medicolegal autopsy.

This presentation will impact the forensic science community by providing details of pathology and normality in a population of obese individuals who have died both of and with their disease.

Obesity is an increasingly prevalent problem in the United States, Australia and internationally. In both the U.Ss and Australia, in excess of 25% of the adult population are obese (body mass index, BMI, greater than 30kg/m^2). In all, in excess of 60% of adults are presently either overweight (BMI, between 25kg/m^2 and 30kg/m^2) or obese, and these levels have been increasing over the last decade. Obesity is linked to a wide range of chronic and acute disease, and previous studies have shown a strong association between obesity and premature death. However, these studies have almost invariably involved acceptance of clinical diagnoses on death certificates and in medical records, and are generally not based on confirmed autopsy observations. Autopsies are frequently not performed in cases of morbid obesity, with many reasons proffered, including a pre-existing assumption as to the cause of death, a general unwillingness to perform autopsies in such cases and a concern about the occupational safety and health of pathologists and mortuary personnel.

In this study, a cohort of 1,000 deaths reported for medicolegal examination in Sydney, Australia were retrospectively studied, in Class II (BMI 35 to 40kg/m^2) and Class III (BMI greater than 40kg/m^2) obese adult autopsy subjects. Full autopsies were performed in all cases, with histologic examination performed on representative tissues in all, and toxicology testing in relevant cases.

Of the 1,000 subjects, 59.2% were male, 40.8% were female, and the median age of the study population was 57 years (range 18 to 91 years). There was an inverse relationship between age at death and BMI. The median BMI in the study population was 38.74 and ranged from the minimum inclusion BMI of 35kg/m^2 up to 94.81kg/m^2.

The manner of death was natural in 80.1% of cases, and the most common cause of death was cardiovascular disease in 49.1% of all case, followed by pulmonary causes which accounted for 13.7% of all deaths. Neoplastic diseases were given as the cause of death in only 1.2% of cases. Homicide was the manner of death in 1.3% of cases and 4.4% were suicides. 14.2% of deaths were considered accidental. Positive toxicology was recorded in 46.9% of cases and drug toxicity was the direct cause of death in 8.8% of cases. Obesity was given as the direct cause of death in 2.4% of cases, with an additional 2.0% of subjects having obesity listed as an antecedent cause and 13.6% as a significant condition contributing to death. Cause of death was unascertained or undetermined by the autopsy pathologist in 3.0% of cases.

Obesity is known to have many serious effects on the cardiovascular system. Cardiac pathology in 88.8% of cases was identified, with significant coronary artery atherosclerosis the most common finding. Severe, potentially lethal coronary atherosclerosis was observed in 37.5% of cases. Paradoxically, and as reported previously, those cases with a BMI greater than 50 kg/m^2 were found to have less severe atherosclerosis than the less severely obese. High rates of pathology were also identified in the respiratory system (87.7%) and in the liver (77.8%) with hepatic steatosis identified in two thirds. Renal pathology, predominantly nephrosclerosis and other forms of chronic renal disease, was observed in 60.5% of cases.

The autopsy investigation of cases of morbid obesity can provide important information to pathologists, law enforcement and public health authorities on the nature of this disease and events surrounding death. As probably expected, there is a high rate of lethal heart disease, and pathology of other major organ systems is very common, which together result in high rates of premature death. A detailed description and characterisation of the lethal form of this disease can only assist in designing effective death prevention strategies in a very common condition which is increasing in frequency. Finally, we note the low number of cases where obesity is given as a cause of death or a contributor to the death in this study – both pathologists and clinicians should be encouraged to include obesity in the cause of death formulation in those cases where appropriate.

Autopsy Pathology, Obesity, Sudden Death

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