



Pathology & Biology Section – 2008

G49 Hypertensive Heart Disease May Compound the Risk of Death From Medication and Contrast Media-Induced Anaphylactic Shock

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After attending this presentation, attendees will understand some principles of the pathophysiology and epidemiology of lethal anaphylactic shock. Additionally, specific forensic autopsy findings related to anaphylactic shock will be reviewed.

This presentation will impact the forensic community because in this retrospective case review, all autopsied cases of individuals with medication or contrast media-induced anaphylactic shock included findings of cardiac abnormalities and, specifically, left ventricular hypertrophy was found in seven of eight cases.

The pathophysiology of anaphylactic shock is complex, involving cross-linking of IgE receptors on the surface of mast cells, causing massive degranulation and subsequent adverse effects on the cardiovascular and respiratory systems. Circulatory collapse results from impaired venous tone and venous return, as well as decreased cardiac output. Respiratory failure results from reactive airway changes as well as upper airway swelling and obstruction and pulmonary edema.

A review of several case series in the recent literature shows that deaths from medication and contrast media-induced anaphylaxis occur more often in elderly individuals, especially those with comorbid diseases, and are more common than deaths from anaphylaxis caused by Hymenoptera stings and food allergies. Postmortem measurement of serum tryptase, a marker for mast cell activation, has been found in several studies to be a sensitive and specific test that can support a diagnosis of death from anaphylactic shock. The purpose of this study was to determine whether a retrospective review of medical examiner cases in the greater St. Louis region would corroborate the findings of previous case series reported in the literature.

A computer search was utilized to find all cases in St. Louis City and surrounding counties in the past twenty years in which the sole immediate cause of death was listed as anaphylactic shock. Twenty-two such cases were found. In eleven cases, a complete autopsy was performed at the Medical Examiner's office; in one case, a complete hospital autopsy was performed; in one case, an external examination only was performed; and in nine cases, the body was released after review of the medical investigator's report.

Among the seventeen individuals with anaphylaxis induced by medication or contrast media, thirteen were over the age of fifty. By contrast, of the five individuals with "idiopathic" anaphylaxis or anaphylaxis related to Hymenoptera stings or food allergies, four were under the age of fifty. Of the twelve cases in which a complete autopsy was performed, three cases included individuals with a swollen tongue or lips; eight included findings of laryngeal edema; ten had cardiac abnormalities; seven had pulmonary abnormalities; and two had mild cerebral edema. In the five cases in which postmortem serum tryptase levels were measured, four showed levels above the upper limit of the normal reference range (13.5 ug/ml) and all five showed levels above 10 ug/ml.

Many of the individuals who died as a result of medication or contrast media-induced anaphylactic shock suffered from comorbid diseases including obesity, diabetes, and atherosclerosis. Significantly, cardiac abnormalities were found in all of these cases in which a complete autopsy was performed. Specifically, the finding of left ventricular hypertrophy, which is strongly associated with hypertensive heart disease, was found in seven of eight cases.

The findings of this study corroborated those of previous case series, which reported that death from medication or contrast media-induced anaphylactic shock most commonly occurs in elderly individuals, many with comorbid diseases. Interestingly, in this case review, all of these autopsied cases included findings of cardiac abnormalities and, specifically, left ventricular hypertrophy was found in seven of eight cases. The association of hypertensive heart disease with death from anaphylactic shock merits further investigation and could have broad implications for the medical community if confirmed in larger studies.

Anaphylaxis, Hypertension, Hypertrophy