H68 Liver Pathology at Autopsy in First Presentation of Diabetic Ketoacidosis (DKA)

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After attending this presentation, attendees will understand the liver pathology seen on first presentation of DKA.

This presentation will impact the forensic science community by indicating the frequency of deaths during first presentation of diabetes mellitus and the pattern of liver pathology in these cases.

Ketoacidosis is a common finding at autopsy, representing around 1% of autopsy diagnoses in this study's practice. The two most common reasons for ketoacidosis at autopsy are Diabetic Ketoacidosis (DKA) and Alcoholic Ketoacidosis (AKA).

Liver disease is common in both populations. Deaths from DKA and AKA have previously been analyzed to compare the liver pathology present at death. This study details examination of deaths from diabetic ketoacidosis in which people died on first presentation and were not previously known to be diabetic. Deaths from Toronto and Ottawa, Canada, were studied over a five-year period from 2008 to 2013. The demographics and liver histopathology were examined. There were 21 deaths (13 male, 8 female) identified dying on first presentation of diabetes mellitus out of a total 79 people dying from diabetic ketoacidosis. This represents 26.6% of deaths from DKA. The median age of the first presentation cases was 51 years, mean 51 years, and range 30-68 years. Their Body Mass Index (BMI) ranged from 16 to 40.4, with a median of 25.2 and a mean of 26.3.

Liver histology was available in each case. Each liver was scored according to the method of Kleiner et al.[1] The following were scored: degree (0-3) and location of steatosis (0-3); fibrosis (0-4, with 4 being cirrhosis); portal (0-1) and lobular inflammation (0-2); and presence of glycogenated nuclei (0-1). Two cases could not be scored for steatosis because of decompositional changes. Four cases were not assessed for fibrosis. Four cases could not be assessed for inflammation and three cases for glyogenated nuclei. The findings identified steatosis being present in 18 of 19 cases assessed and was grade 2/3 for degree in 10/19 cases and grade 2/3 for location in 17/19 cases. Fibrosis was grade 2/3 in 10/17 cases. None of the cases was cirrhotic. Inflammation was present in 11/17 cases and glycogenated nuclei were seen in 7/18 cases.

Death during the first presentation of diabetic ketoacidosis forms a significant proportion of ketoacidosis deaths. Non-alcoholic fatty liver disease is present in a high proportion of these patients dying on first presentation of diabetes mellitus, with significant degrees of fibrosis already established. These patients were generally not obese, with a median BMI of 25.2. In view of these findings, the presence of fatty liver disease with fibrosis cannot be assumed to be related to excess alcohol consumption.

Reference(s):

1. Kleiner D.E., Brunt E.M., Van Natta M., et al. Design and validation of a histological scoring system for nonalcoholic fatty liver disease. *Hepatology* 2005:41(6):1313-21.

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