G97 The Postmortem Diagnosis of Diabetic Coma

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After attending this presentation, attendees can expect to learn about a histology method that will make it easier to establish the postmortem diagnosis of diabetic coma and with a perspective to the significance of hyperlipidemia.

This presentation will impact the forensic community and/or humanity by significantly improving in the postmortem diagnosis of diabetic coma, but it is equally important to focus on the role of the lipids in the abnormal metabolism of diabetics and alcoholics.

The postmortem diagnosis of diabetic coma has always been difficult as one of the key markers of coma is a high glucose concentration, but this concentration is rapidly decreasing after death. Only few laboratories are able to quantitatively detect ketone bodies, and the diagnosis is usually based upon a combination of the history, the glycated hemoglobin concentration and a semi-quantitative detection of acetone.

It has long been known that in death due to diabetic coma there is a vacuolization of the proximal tubules of the kidneys. This vacuolization has until recently been believed to consist of glycogen, but it is now known that it represents an accumulation of triglycerides.

In a consecutive series of fourteen cases of diabetic coma, lipid staining was performed on cryostat sections of the kidneys. It was demonstrated in all of the fourteen cases that the vacuolization consisted of lipids. The sensitivity was thus 100 percent.

In alcoholic ketoacidosis, the lipid level in blood is high. So far, the authors have been able to perform lipid staining of one case of fatal alcoholic ketoacidosis and found the same phenomenon in the proximal tubules of the kidneys as in diabetic coma.

It is thus likely that the deposition of lipids in the proximal tubules is due to the high concentration per se and not increased permeability of the glomerulus as is seen in diabetics.

There has only been little focus on lipids in forensic medicine. One reason may be the need to do cryostat sections if lipids are to be demonstrated in the tissue. Otherwise they will be disguised as empty spaces due to dissolving in alcohol during tissue embedding.

Both in diabetic coma and in alcoholic ketoacidosis there are high levels of fatty acids and a disturbance of the metabolic balance that is influencing the citric acid cycle.

This study suggest that ketone body analysis should be done in cases of “fatty liver deaths” as there are indications that many of these deaths are due to the increased fatty acid concentrations following a binge and a subsequent development of ketoacidosis.

Diabetic Coma, Hyperlipidemia, Cause of Death

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