STRUCTURAL CHARACTERISTICS IN HEPATIC STEATOSIS
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Summary
The present study aims at highlighting the structural characteristics that occur in hepatic steatosis. To this end, the changes brought about by this pathology on hepatic level were noticed through the classical histological technique. In this context, the optical microscopy was resorted to with a view to visualizing and analyzing the samples. The studied pieces were necroptically collected from eight deceased patients; their medical history including, along with other diseases, disorders of the digestive tract and its annexed glands. For comparison, permanent microscopic samples made by sections on normal liver were noticed and analyzed through the classical histological technique. To study purposes, Nikon optical microscope was resorted to. The permanent microscopic samples were watched by lenses of x10 and x40 magnifying power, using the Haematoxylin-Eosin staining, van Gieson staining, Masson staining and Goldner-Szeckely staining.

Key words: liver, hepatic steatosis, optical microscopy, structural characteristics
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Introduction
Hepatic steatosis stands for a frequent pathology nowadays, due to the multitude of risk factors (Bernuau et.al., 1986). In this context, among the causes of the hepatic steatosis, one may find alimentary habits, intake of drugs, toxic compounds and variegated pollutants, which negatively act on the hepatic function (Hu KQ et.al., 2007). They are supplemented by certain diseases of genetic determinism or of risk, whereof obesity and not least alcoholism, as major risk factor, are highly important for health (Hayman et.al., 2009). Therefore hepatic steatosis is classified in non-alcoholic and alcoholic (Fiore et.al., 1996).

Nowadays, hepatic steatosis is encountered both in young ages and especially, within medical practice, in elder ages, after 40 years old, quite equally in both genders, according to the risk factors incriminated in the disease (Bohte et al., 2011).

The diagnosis of hepatic steatosis is useful where the hepatic pathology in this context may advance, with repercussions on the patient’s health and life quality (Cho et.al., 2006). From this standpoint, screening programs are useful, which should timely detect and diagnose hepatic steatosis, as preventive measure in the potential further deterioration of the hepatic function, as well as of the hepatic parenchyma (Mc Cormack et.al., 2007).

Material and methods
There were studied by the classical histological technique, resorting to Nikon optical microscope, permanent microscopic samples, obtained from pieces necroptically taken from eight deceased patients with a medical history including disorders of the digestive tract and its annexed glands, noticed in the liver, represented by hepatic steatosis.

In order to characterize the structural modifications in this type of pathology, there were used for comparison, microscopic samples with normal aspect of the liver, made with trichrome staining, the pieces being taken from six deceased persons without medical history marked by disorders of the digestive tract and its appended glands.

The staining used for characterizing the structural elements of the normal liver are Masson trichrome staining and Goldner-Szeckely trichrome staining.
In order to visualize the structural aspects in hepatic steatosis, Haematoxylin-Eosin staining and van Gieson staining were resorted to.

The structural elements of the normal liver and the characteristic structural aspect of hepatic steatosis were watched with a Nikon optical microscope, using lens of x10 and x40 magnifying power.

Results and discussions

On a permanent histological sample, made in cross section, one may overall notice the structure of the normal liver, with delimitating cords of hepatocytes and with the components of the bile duct space (Figure 1). Using a lens of x40 magnifying power, one may thoroughly highlight the cords of hepatocytes with their delimitation and one may easily see the nuclei of the hepatic cells (Figure 2).

On another permanent microscopic sample made in cross section, there are emphasized in detail, resorting to trichrome staining and lens of x40 magnifying power, the cords of hepatocytes, their delimitation and the structural components of Kiernan porto-biliary space, represented by a branch of the hepatic artery, a branch of the portal vein and the bile canaliculus (Figure 3).

The trichrome staining used in the study is suggestive for describing the structural elements of the normal liver. From this standpoint, both Goldner-Szekely staining and Masson staining allow structurally watching in detail, using x40 lens, the disposal of the hepatocyte cords as well as the elements of the porto-biliary space, represented, as aforementioned, by a branch of the hepatic artery, a branch of the portal vein and the bile canaliculus. In this context, one can structurally make a difference with reference to the three elements making up Kiernan space. Likewise, one can notice in cross section, the difference between the calibre of the portal vein, which is higher than the one of the hepatic artery, the latter having however a thicker wall than the portal vein. Withal, as anatomic and structural element, component of the porto-biliary space, the bile canaliculus can be seen on cross sections through the liver, by watching the simple cubic epithelium, lining it.
If the structural aspects viewed on normal liver sections, achieved in cross sections, making permanent microscopic samples were previously described; hereafter reference is made to the analysis and description of the structural aspects characteristic of hepatic steatosis. Therefore, one may watch on permanent microscopic samples made in cross section through the liver, both the cords of hepatocytes with their delimitation and the variably sized areas, constituting lipid vacuoles that are characteristic of the disease. They stand out, according to the staining resorted to, either as blanks, as in Haematoxylin-Eosin staining, or specifically nuanced spaces, as in van Gieson staining, used in the framework of the study herein.

On a cross section through the liver, resorting to Haematoxylin-Eosin staining, one may highlight here and there, in the hepatic parenchyma, the fatty spaces specific to hepatic steatosis. Likewise, watching under the photonic microscope the lipid components in the hepatic parenchyma in guise of vacuoles, is characteristic of hepatic steatosis (Figure 4). At the same time, the presence of the lipid component in the steatosic hepatic parenchyma, is thoroughly noticed, using a lens of higher magnifying power, respectively x40 (Figure 5).

Using van Gieson staining and lens of x40 magnifying power, one may more accurately watch the lipid charge specific to hepatic steatosis. In this context, lipid vacuoles can be seen in the hepatocytes, the lipid component accumulating in the conditions of lipoprotein-transportation disturbance or fatty-acid accumulation.

With reference to hepatic steatosis, alcoholism is reckoned as factor of hepatotoxic potential, with implications on the interference between the mitochondrial and the microsomal function in hepatocytes, leading to fat accumulation in the hepatic parenchyma (Figure 6).
Conclusions

Hepatic steatosis represents a frequently encountered current pathology, which has various causes and allows the patients’ investigation to diagnostic purpose. From this standpoint, sufficient cases exist nowadays which, unless timely diagnosed in order to determine the therapeutic conduct, lead to the patient’s decease.

In this context, the study herein allowed necroptically watching, through the classical histological method, some illustrative permanent microscopic samples. This way, the comparison with the normal structural aspect of the liver sections becomes useful in the conditions where the characteristic structural modifications are visible on the pathological permanent microscopic samples.

This study may be continued by completing the laboratory techniques with more or less invasive imaging investigations for the patient, whereof abdominal ultrasound, as first non-invasive imaging method that allows diagnosing hepatic steatosis.

References


