HISTOPATOLOGICAL ASPECTS IN NONALCOHOLIC STEATOHEPATITIS

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Abstract: The paper analyzes the macroscopic and the microscopic modifications of the liver, on a batch of dead patients,suffering from nonalcoholic steatohepatitis,all from the Districtual Hospital of Botosani, between February-June 2006. Nonalcoholic steatohepatitis is a condition characterized by two principal diagnostics criterions: evidences of steatosic modifications or of lobular hepatitis and the absence of the alcoholism.

INTRODUCTION

As generally known, the liver is a very special, unique organ of the human body, as due to its capacity to regenerate after maladies or temporary lesions having affecting it. Any modification occurring at hepatocyte level disturbs its structural equilibrium, thus putting into evidence the interferences with its functions (Paun, 1997; Gherasim, 2000). For example, a multiple functional relation is active between the liver and the blood tissue, while the homeostatic modifications at blood level appear as the more severe, the more pronounced is the liver disfunction.

Fatty liver or the steatosis represents the lipids accumulation inside of the hepatocytes, being a histopatological aspect often met on biopsy fragments. The accumulated lipids quantity is variable, as well as accumulated lipids, which can be: triglycerides (most of the cases), cholesterol, phospholipids, sphingolipids. Considering the accumulation manner of the lipids in the hepatic cells, we can divide steatosis in microvesicular steatosis and macrovesicular steatosis; this partition is very important because of the different consequences on the hepatocytary function: microvesicular steatosis, even if is more rarely met then the macrovesicular one, lead to a more or less important affection of the hepatocytary function (Lonardo *et al*., 1995). Considering only the descriptive point of view, steatosis is considerated a hepato-cellular injury, met in different hepato-cellular or systemic affections. In most of the cases, nonalcoholic steatohepatitis is met in 50-60 years old adults, being more frequently at women (65% up to 83%), comparatively with the men. There are some conditions associated, more frequently, to nonalcoholic steatohepatitis, as follows: the obesity (oftentimes), some drugs or toxins, some attained metabolic or congenital affections (Pinto *et al*., 1996).

The present paper discusses the results of some investigations devoted to macroscopic and microscopic liver modifications in patients suffering from nonalcoholic steatohepatitis, hospitalized in the Mavoromati Districtual Hospital of Botosani, between February-June 2006.

MATERIALS AND METHODS

The study starts from the results of the microscopic examination of the liver samples taken over from the dead patients, suffering from nonalcoholic steatohepatitis, in the above-mentioned period. The pieces of liver tissue were fixed for light microscopy in 10% solution of formaldehyde, dehydrated in ethanol and amylic alcohol, embedded in parafin and sectioned at 1-2 microns. They were stained with hemalaun-eosine and examined with a Novex microscope and photographed with a Panasonic TZ1.

RESULTS AND DISCUSSIONS

The healthy liver contains approximatively 5 g lipids per 100 g dry liver tissue; percentually, these lipids are formed from: 50% phospholipids, 20% triacylglycerol, 7% cholesterol (especially unesterified cholesterol) and other lipids. The normal hepatocytes contain a small number of lipidic beads, visible only in elctronic microscopy, placed at the side of the agranular endoplasmic reticulum, mitochondrias and peroxisomes. These lipidic beads are represented by triacylglycerol, which is synthetised in the agranular endoplasmic reticulum and processed in the granular endoplasmic reticulum and Golgi apparatus for export lipoproteins synthesis. Fatty liver is smooth, big, with a round inferior margin, and not tough (Abdelmalck *et al*., 1995). It is often not painful; however, it is sometimes sensitive in palpation. Fatty liver reveals an important increase of his size and weight, arriving even up to 6 kg; thus, the lipids can reach up to 50% of the dry liver tissue (Sheth *et al*., 1997).

Figure 1. Typical fatty degeneration

Such liver tissue appears like a light yellow, and a section surface has an unctuous aspect. The lipids accumulation is, generally, a diffuse process (Burt *et al*., 1992). In liver biopsy samples, the lipids accumulation is represented by the presence of some cytoplasmic vacuoles inside the hepatocytes (Haruta *et al*., 2007); in this process, the Kupffer cells are not implicated.

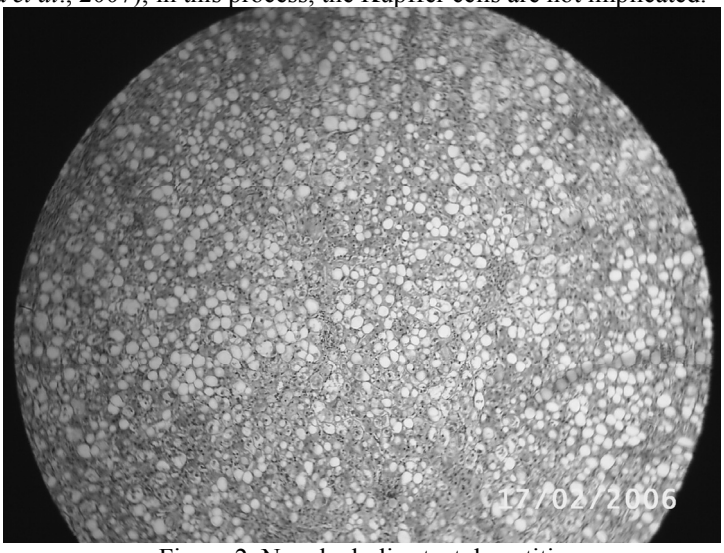

Figure 2. Nonalcoholic steatohepatitis

In optical microscopy we can recognize two types of lipidic storages. The frequentliest one is the macrovesicular steatosis aspect, in which the hepatocytes are relaxed and contain a single, big lipidic vacuole (the diameter diversifyes from 1 up to 10 μm), which pushes the nucleus to periphery. Rarelyer, the lipids are accumulated under the shape of some small,

numerous beads (the diameter below 1 μm), which surround the central nucleus. This lipidic accumulation type is known as microvesicular stetosis. This type of steatosis appears in a limited

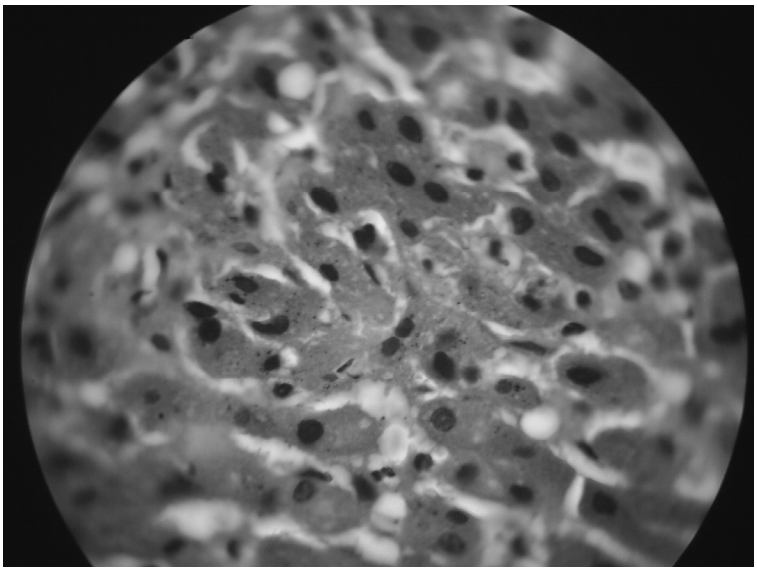

Figure 3. Granulo-vacuolar distrophy, lipidic and venous stasis

number of affections and, generally, has more serious clinical implications.

The fatty liver evolution has been studied at ultrastructural level, on numerous experimental liver injury models (Grimm *et al*., 1992). The lipids initially accumulate in the endoplasmic reticulum, like small globules; in this stage, the lipids are connected by the cell membrane. These globules fuse, the lipids sweep the endoplasmic reticulum barrier, forming bigger beads; thus, there is a transition from the microvesicular aspect to the macrovesicular one. There are evidences testifying the same sequence realised in human being; the difference between the two aspects is, probably, the severity and the lipids accumulation continuance expression (Tehli *et al*., 1995). The striking type identification of lipids storage has a major utility for the signs regarding steatosis etiology.

CONCLUSIONS

In our study, we observed the morpho-structural patological modifications met in nonalcoholic steatohepatitis. The macroscopic aspects include the normal or the increased liver dimensions, his round inferior margin; fatty liver reveals an important increase of his size and weight, arriving even up to 6 kg, the lipids can reach up to 50% of the dry liver tissue. The liver tissue appears like a light yellow, and a section surface has an unctuous aspect. The microscopic aspects: in macrovesicular steatosis, the hepatocytes are relaxed and contain a single, big lipidic vacuole, while in microvesicular steatosis, the lipids are accumulated under the shape of some small and numerous beads, very delicate dispersed.

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