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LIVER PATHOMORPHOLOGY OF PREGNANT WOMEN WHO DIED FROM COVID-19

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Abstract:

No specific changes are observed in fetal liver in COVID-19. Most directly related, damage to the endothelium of liver blood vessels, dystrophic changes occurring in the endothelium of the walls of hem capillary sinusoids, mucoid thickening, multifocal desquamation and plug-like obturation of small capillary sinusoids, as well as dystrophic changes in the hepatocytes close to this field: fatty dystrophy, with changes in the appearance of hydropic dystrophy continues. Clinically, morphologically, depending on the area occupied by most of these changes, it continues with the occurrence of liver failure and HELP syndrome. From a clinical morphological point of view, the development of parenchymatous jaundice and progressive necrosis of the liver was studied. Macroscopically, it is determined that the liver is enlarged, softened, its outer surface has a variegated color, that is, small foci of hemorrhages and yellow-brown foci appear under the membrane, and its parenchyma also has a false nutmeg color when the tissue is cut.

Keywords: Liver, coronavirus infection, maternal mortality, liver morphology

RELEVANCE OF THE TOPIC: assessment of specific pathomorphological features of the liver in cases of maternal death with liver pathologies not related to acute and chronic hepatitis, assessment of specific pathomorphological features of the liver in cases of maternal death related to COVID-19, and the diagnostic value of quantitative indicators of morphological data in the differential diagnosis of primary and direct causes of maternal death conducting scientific research aimed at proving it is of particular importance. During the epidemic period of the COVID-19 pandemic, pregnant women infected with the virus are considered relevant in strengthening the measures taken to prevent them, taking into account the possibility of Severe And Life-Threatening Pathological Processes In The Liver.

PURPOSE: To clarify the degree of infection of pregnant women with COVID-19, the morphogenesis and pathomorphological changes of organ and tissue damage.

MATERIAL AND METHODS: clinical and anamnestic data of a total of 29 cases of maternal death autopsy, medical history and diagnosis of Kovid-19 during pregnancy, and autopsy materials of the liver of women who died with somatic diseases in 13 cases were obtained.

RESULTS OF THE STUDY AND THEIR DISCUSSION:
Livers of pregnant cows that died of COVID-19 were examined macroscopically during autopsy. It was found that most of the women who died of covid-19 had an increased weight and size of their livers. In the section of the liver, it was found that the surface was flat, some of them had coagulation necrosis with large and small foci. In case of massive progressive liver necrosis in the liver, clinical laboratory analyzes showed a sharp increase in liver enzymes, the development of HELLP syndrome. The macroscopic image of the liver in cases of massive necrosis of the same liver against the background of Kovid-19 is presented in Figure 1.
Different histological changes were detected in the microscopic study of the liver depending on the periods of the coronavirus disease. During the exudative period of the coronavirus, Di circulation processes predominate in the liver tissue of women who died, i.e. sinusoids are sharply expanded, blood is poured around them, and hepatocytes are irregularly located (see Fig. 2).
Changes specific to the effect of the virus were manifested by the structure of the walls of the sinusoids,

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that is, by the enlargement of the Kupffer cells, the cytoplasmic protein and hydropic dystrophy, and the appearance of lymphoid cells. In this case, the columnar arrangement of hepatocytes was disturbed, the interstitial tissue expanded due to swelling, and a large accumulation of macrophages and lymphocytes was observed in its composition. It was found that the nucleus of Kupffer cells increased due to hypertrophy and vacuolization of the cytoplasm (see Fig. 2).

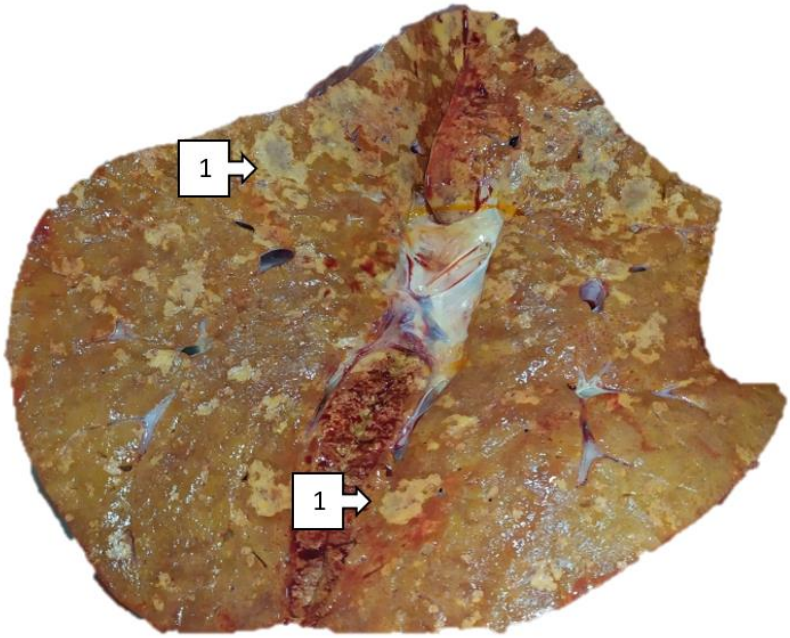

Figure 1. L. who died in the 36th week of pregnancy infected with coronavirus. a woman named Jigari. Macroscopically, foci of coagulation necrosis are detected on many surfaces.

Eosinophilic and hematoxylin inclusions appeared in the cytoplasm and nucleus of some Kupffer cells, which was characteristic of viral injury. When studied under a microscope, it is clear that the Kupffer cells are separated from the liver cells and the sinusoid wall, and the cytoplasm is darkly stained with eosin and contains hematoxylin (see Fig. 3). This situation is evident from the analysis of literature data, that is, it confirms the damage of endothelium and Kupffer cells by SARS-CoV-2.

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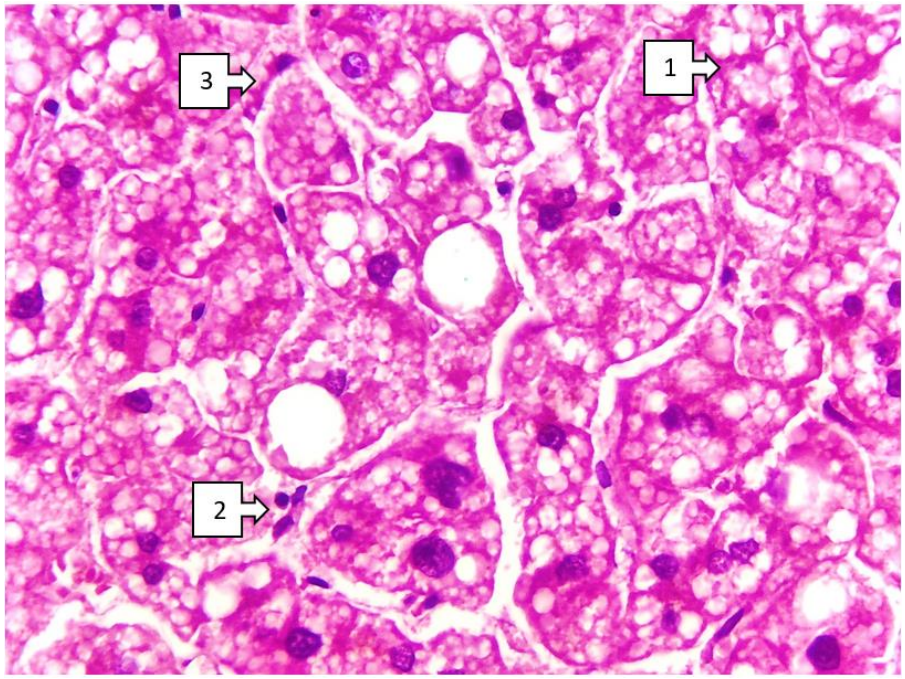

Figure 2. K. who died in the 33rd week of pregnancy infected with coronavirus. a woman named Hepatocytes are shriveled and irregularly located (1), lymphocytes have appeared among them (2), eosinophilic inclusions have appeared in the cytoplasm of Kupffer cells (3). Paint: G-E. Floor: 10x40.

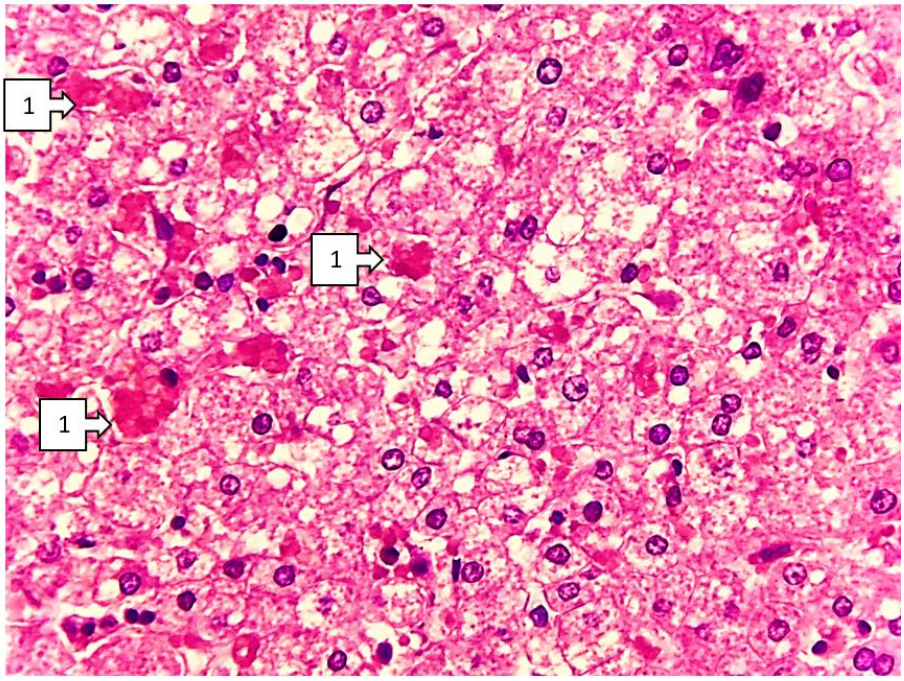

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Figure 3. K. who died in the 33rd week of pregnancy infected with coronavirus. Foci of erythrocyte thrombi formed on the desquamated surfaces of the endothelium in the hem capillary sinusoids (1). Paint: G-E. Floor: 10x100.

Under the influence of SARS-CoV-2, damage to the endothelium of liver sinusoids as well as Kupffer cells, accumulation of lymphocytes around them, i.e., they become larger, dystrophy in their cytoplasm increases, metachromasia develops, and blue coloration indicates that the exchange of proteins and carbohydrates is also disturbed.

Some of the pregnant women who died from the coronavirus have other unique pathomorphological changes in their livers, i.e., it is found that the Kupffer cells are swollen and enlarged due to the effect of the coronavirus. In this case, it is observed that the cytoplasm of Kupffer cells becomes vacuolated and stained with blue color, myxamatosis is caused by the violation of carbohydrate metabolism along with protein (see Fig. 4).

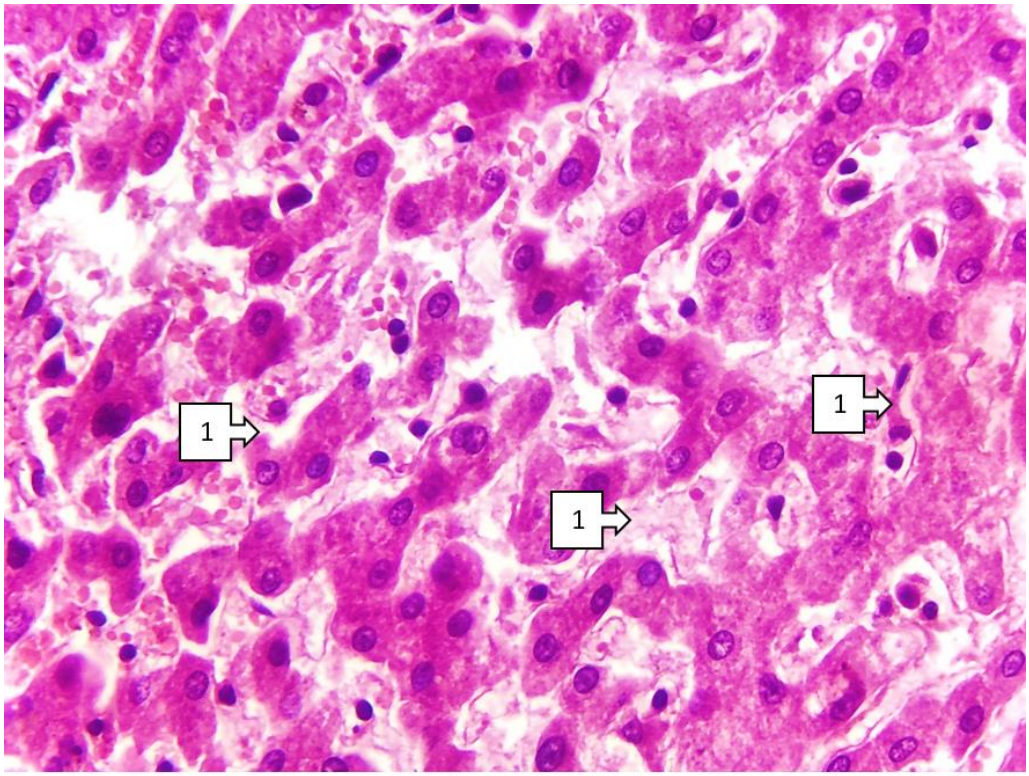

Figure 4. A. who died in the 38th week of pregnancy infected with coronavirus. Reticular protein structures are identified between the massive expansion of female sinusoids and spaces of Disse (1). Paint: G-E. Floor: 10x40.

Lymphocytes appear next to these cells and adhere to the Kupffer cell, which means that an immunopathological process has developed against the autoantigen caused by the virus. It is observed that some areas of the liver parenchyma are filled with blood, and the cytoplasm of hepatocytes is affected by small vesicular dystrophy due to protein and hydropic dystrophy.

When the livers of pregnant women who died during the second period of the coronavirus, i.e. during the proliferative inflammatory period, were studied, it was observed that changes typical of the proliferative

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inflammatory process also appeared in this organ. In this case, it is determined that a strong lymphoid and macrophage infiltration has appeared around the portal tracts of the liver. The peculiarity of this process is that the lymphoid infiltration developed around the biliary tract (see Figure 5), the accuracy presented in the scientific literature shows, that is, it confirms the damage of more cholangiectasis with coronavirus.

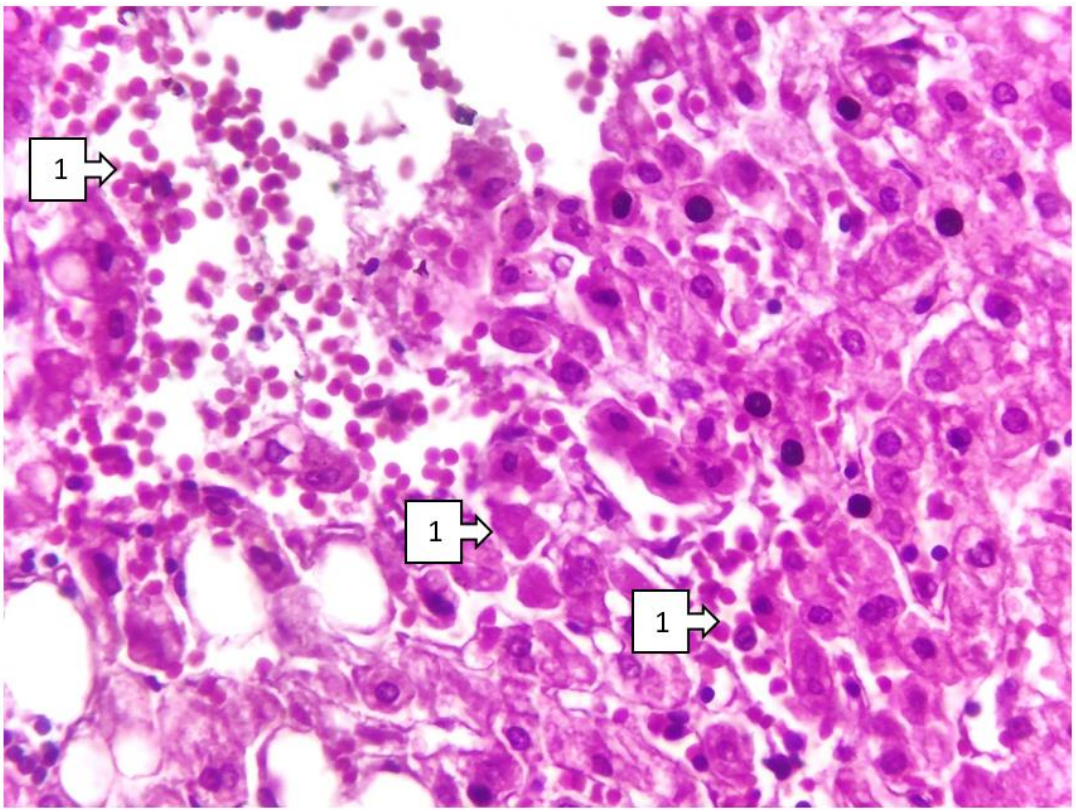

Figure 5. M. who died in the 35th week of pregnancy infected with coronavirus. with large necrosis foci and hemorrhage foci in the liver of a woman named (1). Paint: G-E. Floor: 10x10.

It should be noted that T-lymphocyte infiltration occurs against any viral infection. When studied under a microscope lens, it is determined that the epithelium of the bile ducts in the portal tracts is swollen and enlarged, as a result, the bile ducts are proliferated. In this case, it is determined that the surrounding lymphoid infiltration is mainly located near the bile ducts, and lymphocytes form a symbiosis with cholangiectasis (see Fig. 6).

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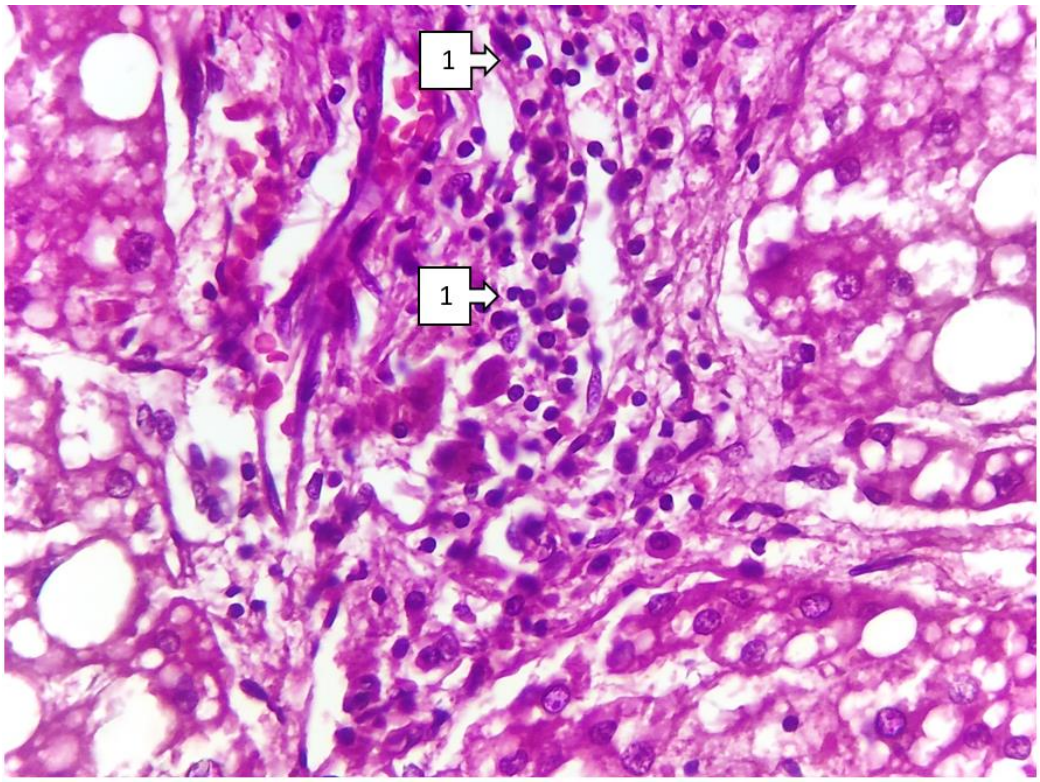

Figure 6. M. who died in the 35th week of pregnancy infected with coronavirus. In the portal tract, sharply developed lipocyte infiltration and interstitial swellings are detected between the tissue structures (1). Paint: G-E. Floor: 10x40.

During the prolonged proliferative inflammatory period of the coronavirus, when fibroblasts were found to proliferate and multiply in the lungs, a strong proliferation of fibroblasts and fibrous structures was observed in the liver around the portal tracts. In this case, it was found that connective tissue rich in fibrous structures grew around the portal tracts and liver lobes (see Fig. 7).

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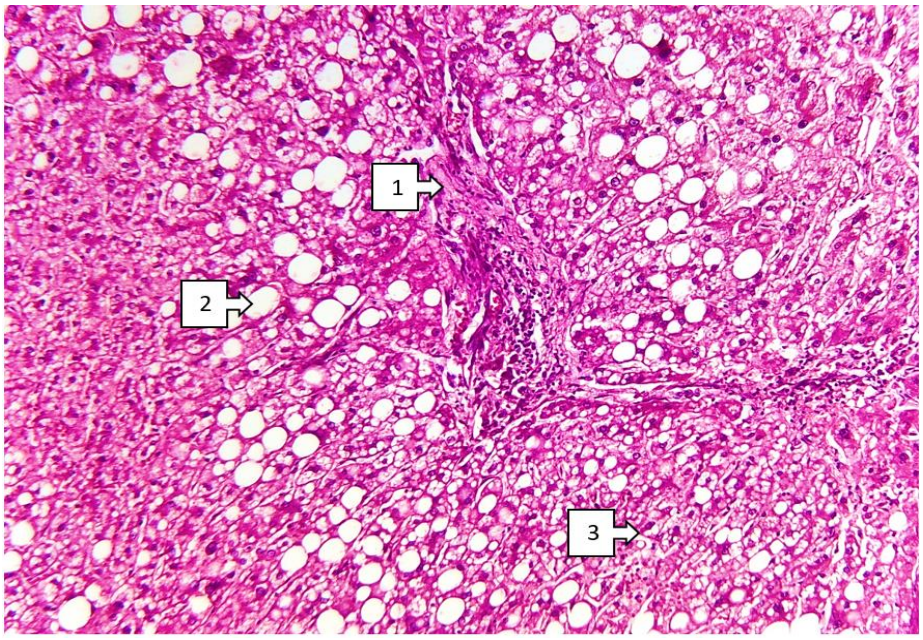

Figure 7. T. died in the 37th week of pregnancy infected with coronavirus. female liver portal tracts, fibrous tissue consisting of fibrous structures around the lobes (1), hepatocytes with large drops of fatty dystrophy are detected in hepatocytes in the periportal branch (2), foci of hydropic dystrophy with varying degrees of development are detected in peri lobular hepatocytes (3). Paint: G-E. Floor: 10x10.

It was observed that the fibrous structures penetrated between the hepatocytes, and even the basement membrane of the wall of the sinusoids thickened and turned into a fibrous structure (see Fig. 8).

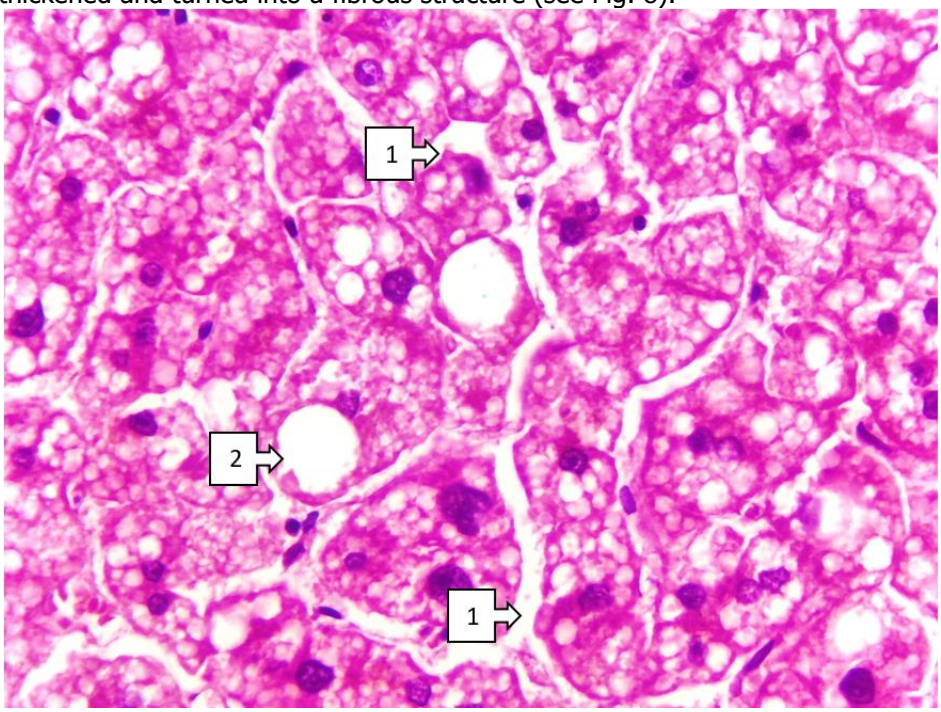

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Figure 8. T. died in the 37th week of pregnancy infected with coronavirus. female liver tissue with the same appearance interposition of sinusoidal walls (1), fatty dystrophy with large drops in hepatocytes (2). Paint: G-E. Floor: 10x100.

When the histochemical method for the determination of connective tissue fibers was used, fibrous structures stained red with profusion were identified along the portal tracts, around the liver lobes, and in the wall of the sinusoids.

According to the results of the scientific research conducted by the scientists of the world, although SARS-CoV-2 and MERS-CoV can cause damage to the liver. However, the mechanism of liver damage is hardly understood. Virus-induced effect, systemic inflammation, hypoxia, hypovolemia, hypotonia also damage the liver in case of coronavirus infection. ACE-2 is expressed more in cholangiocellular epithelium and less in hepatocytes, therefore it damages cholangiectasis more than hepatocytes. As a result of molecular genetic examination, SARS-CoV-2 was detected not only in lung epithelium, but also in hepatocytes.

SARS-CoV-2 directly affects the liver, depends on the replication of the virus in liver cells and its direct cytotoxic effect. Studies have shown that RNA-seq highly detectable SARS-CoV-2 results in strong expression of AAF-2 in the liver mainly in cholangiectasis, Kupffer cells, and endothelium. SARS-CoV increased the apoptosis of hepatocytes with the help of its special protein. These data confirm that there is a direct effect of the coronavirus on the liver.

CONCLUSIONS

1.In case of Covid-19 infection, the development of massive liver necrosis in morpho functional deficiency in liver tissue is high, it is clinically morphologically in the background, and it is manifested by causing difficulties in the process of clinical diagnosis.

2. Simultaneous hydropic and fatty dystrophy in hepatocytes is characteristic, and the essence of 2 types of dystrophic changes is directly related to vessel wall damage.

3. In the histiotopography of the liver of women who died from the infection of Kovid-19, the massive meeting of erythrocyte and fibrinoid microthrombi is often observed in most sinusoidal cavities, and these changes develop as a result of thickening and desquamation of the sinusoid endothelium.

4. In Covid-19 infection, the development of a large amount of lymphocytic infiltration around the portal tracts of the liver is determined.

USED LITERATURE

1. Li Y, Xia L. Coronavirus Disease 2019 (COVID-19): Role of Chest CT in Diagnosis and Management [published online ahead of print, 2020 Mar 4]. AJRAm J Roentgenol. 2020;1-7. doi: 10.2214/AJR.20.22954 36.
2. Licata A., Ingrassia D., Serruto A. et al. Clinical course and management of acute and chronic viral hepatitis during pregnancy. J. Viral. Hepat. 2015. Jun. 22 (6). P. 515-523.
3. Lim W, Dentali F, Eikelboom JW, Crowther MA. Meta-analysis: lowmolecular-weight heparin and bleeding in patients with severe renal insufficiency. Ann Intern Med. 2006 May 2;144(9):673-84. 88.
4. Lindor K.D., Lee R.H. Intrahepatic cholestasis of pregnancy. UpToDate. 2019;
5. Ling Wang, Quan Gan, Shuguo Du, Yun Zhao, Guoqiang Sun, Ying Lin, Ruyan Li. 2020. Acute fatty liver of pregnancy cases in a maternal and child health hospital of China, Medicine. 99, 29, (e21110)
6. Lisman T, Bernal W. 2017. Hemostatic issues in pregnancy-induced liver disease. Thromb Res. 151(1):78-81.
7. Liu D et al. Pregnancy and Perinatal Outcomes of Women With Coronavirus Disease (COVID-19) Pneumonia: A Preliminary Analysis. AJR Am J Roentgenol. 2020 Mar 18:1-6. doi: 10.2214/AJR.20.23072.
8. Liu H, Liu F, Li J, Zhang T, et al. Clinical and CT imaging features of the COVID-19 pneumonia: Focus on pregnant women and children. J Infect. 2020 Mar 20. pii: S0163-4453(20)30118-3.