

melatonin is known to causes no effect on body weight in rats ^(12,13); this might be because melatonin administration does not affect food intake in rats, as it was noticed in our work. The increase of liver weight induced by continuous darkness which was proportionate with length time exposure to darkness, might be explained by the fact that melatonin can reach all body tissues and cells, acting through specific receptors in all body tissues ^(14,15). Once melatonin reaches any bodily tissue it exerts its action immediately, and melatonin has a dose-dependent physiologic action ^(16,17). In the present study no significant hepatomegaly occurred, on those animals kept for 2 weeks of continuous darkness, however there was hepatomegaly accompanied with longer period of darkness. These results could be discussed by the fact that melatonin has damaging effect only when excreted on high level ^(15- 17). The hepatomegaly is essentially the consequence of hepatocyte death which could be of 2 types; the ballooning degeneration leading to massive increase in cell size or, apoptosis; this is also leads to hepatomegaly since these apoptotic cells are entrapped within a large gathering of inflammatory mononuclear cells leading to increasing volume of cellular parenchyma ⁽⁶⁾. The rise in built and thickening of connective tissue bands also could contribute to that hepatomegaly. This large increment in septal thickness is due to the increase in production of fibro-collagenous tissue whenever there are any injurious events to the liver ^(6,18). Also the melatonin has specific effect on fibroblast cells which are the active collagen - secreting cells and the basic forming cells of the connective tissues ^(6,19). The other provider to hepatomegaly could be the dilated blood vessels, because melatonin has a well-known vasodilator action ^(20,21).

The shrink and regression in size of liver was so clear at toxic effect of long dark period , that might be discussed by the fact that liver gets regression and shrink after any toxic damaging effect leading to fibrosis and scaring preventing

the regenerating hepatocytes from expanding the parenchymal mass ^(6,18).

The blurring of the septal-parenchymal junction might be caused by the beginning of increased in connective tissue bulk as discussed previously. The swelling of hepatocytes is always seen in any destructive effect that results from the buildup of fat and water as well as proteins which are normally is exported ⁽⁶⁾.

The heavy infiltration of connective tissues and parenchyma, with lymphocytes, macrophages granulocytes and other mononuclear cells, is due to the inflammatory process within the liver tissues, since these are the principal cells in any inflammatory process ^(6,18). Apoptotic cells are seen in any programmed cell death, to replace the damaged cells by new healthy ones ^(6,21).

The large vacuolated hepatocyte is the form of cell that represents the intermediate type of liver injure, their cytoplasm seen filled with large and small vacuoles of fat, predominantly triglycerides, what is called steatosis, accordingly, these hepatocytes are named steatotic hepatocytes ⁽⁶⁾. Acidophil bodies noticed at this work in fact, were the dead hepatocytes demonstrating current liver damage ^(6,18).

In the last group the hepatic lobules that entrapped within thick bands of fibrous connective tissues were formed by almost normal hepatocytes. The enlightenment for that could be the fact that a new generation of hepatocytes, is formed in an attempt of the liver to substitute the dead hepatocytes ^(6,17,18).

The present study about the histopathological effect of continuous darkness on the liver both macroscopic and microscopic reveals no injurious effect on short period of continuous darkness, whilst it induced ultimately destructive effect with long period of continuous darkness.

The severity of destructive and damaging effects seemed to be correlated with the length of continuous darkness, which could be due to graduated amount of melatonin secretion, because the effect of melatonin is proportional to its level ^(12,23-25). The time-course (30 days), for rats, was regarded as a long period according to