The aim of the present study is to assess the *"histopathological changes*" in liver tissue, in response to gradually increasing periods of continuous darkness in adult male rats.

Methods

Forty healthy mature ten week old male Wister albino rats were kept individually in wire meshed stainless steel cages room temperature 22±2°C, fed controlled pellet diet and tap water was provided for drinking *ad libitum*. They were divided into 8 groups, each consisting of 5 rats. Group I†, Group I,†† Group I,††† and Group I†††† were the control of group II, III, IV, and V respectively. All of the 4 control groups were put on 12:12 light – dark cycle. Group II, III, IV, and V were put in continuous darkness for a period of 2, 4, 6 and 8 weeks respectively. All the 8 groups were kept in and were put individually in–wire meshed. At the last day of 1st couple of weeks, rats of group II with its control group (Group I†), were sacrificed under diethyl ether anesthesia effect, the whole liver was weighed and the right lobe of liver was removed, fixed in Boun's solution immediately and processed through for histopathological study by light microscopy, using serial paraffin sections of 5 µm thickness stained with haematoxyline and eosin [8,9]. At the same manner the rats of group III was dissected at the end of the 4th weeks also with its control group (Group I††). The rats of group IV with its control group (Group I†††), were managed at same way at end of the 6th week, and rats belong to group V with its control group (Group I††††), were operated on at end of the 8th week. Histopathological as well as anatomical examinations were performed. Biostatical analysis was done to evaluate the significance of results by analysis of variance, using student-t-test [10].

Results

Descriptive as well as morphologic studies were done, as follows:

Body & liver weight: There was no significant effect of continuous darkness on the over all body weight as shown in (Table 1).

Table 1. Effect of continuous darkness on the body weight of 10 week old male rats

Time of keeping rats in continuous darkness	Body wt. of rats at 1st day of experiment	Body wt. of rats at last day of experiment	Difference in body wt.
Control (Group I†)	411.17±62.9	437.95±74.9	26.78±11.9
2 week continuous darkness	419.84±77.1	443.81±75.2	23.97±10.8
Control (Group I††)	410.97±65.1	454.42±51.1	43.45±17.1
4 week continuous darkness	422.03±82.9	461.11±80.2	39.08±15.5
Control (Group I†††)	423.23±44.0	491.96±79.0	68.73±23.2
6 week continuous darkness	416.00±72.8	489.09±90.1	73.09±25.2
Control (Group I††††)	418.02±74.6	511.19±75.2	93.17±32.6
8 week continuous darkness	405.25±64.1	503.25±87.7	98.00±34.1

Results were expressed in mean ± SD of 5 rats.
All differences were statistically not significant (P>0.05) when compared with its control.

Liver weight was not affected in group II, whereas it was significantly affected in group III, IV, and V (Table 2). Liver weight to body weight ratio was also estimated (Table 3). Liver weight was increased in group III and still more increased in group IV, and the outer surface of the organ was clearly irregular. Then after, at group V the liver shrank significantly and the outer surface of the organ was markedly nodular.