Biochemical and Histopathological Alterations as Forensic Markers of Asphyxiated Rats and the Modifying Effects of Salbutamol and/or Digoxin Pretreatment

Asphyxia is mainly induced by interference with respiration, or lack of oxygen in respired air as in entrapment suffocation that may occur in animals or human. In this study 24 male albino rats were assigned into four equal groups: G1 (control negative); G2 (exposed to asphyxia); G3 (asphyxiated pretreated rats with salbutamol); G4 (asphyxiated pretreated rats with digoxin). The results revealed no change in the time intervals from onset of suffocation till coma (G2, G3 and G4). Also, all external and internal classical signs of asphyxia appeared on animals of different asphyxiated groups. Moreover, Asphyxiated rats (G2) showed significant ($P \leq 0.05$) increase in serum ALT, AST, urea and uric acid and insignificant increase in serum direct and total bilirubin levels but significant reductions of serum glucose, total protein and albumin levels compared to control ones. Pretreatment with salbutamol or digoxin induced insignificant reverse effects on mentioned parameters than those of asphyxiated rats except in serum ALT and AST activities and serum urea level of digoxin pretreated rats. The histopathological examination of different organs revealed no changes in histopathological appearance between asphyxiated and/or pretreated groups but various pathological alterations mainly congestion, hemorrhage and edema were found in these groups in relation to control group. In conclusion, entrapment asphyxia induced acute and progressive biochemical alterations in liver and kidney functions with presence of classical pathological changes of asphyxia in internal organs. Pretreatment with either salbutamol or digoxin could not improve the altered parameters than asphyxiated group. We recommend further study to asses the extent of reversibility of these parameters after resuscitation of asphyxiated rats.