Molecular versus histopathological examination of the prostate gland in the estimation of post-mortem interval (an experimental study)

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Abstract: After death, multiple alterations of biochemical and pathological processes originate resulting in considerable disturbance of the structure and composition of the human body. These changes occur in a sequential manner that may enable estimation of post-mortem interval (PMI). As prostate is the most resistant organ to decomposition, its post-mortem histopathological changes as well as pattern of DNA degradation may be useful for determination of PMI. This study aimed to investigate the PMI by histopathological examination of the prostate versus its DNA degradation rate in adult male albino rats.

Methodology: One hundred and four albino rats were implemented in the study. They were divided into 4 groups (according to the chosen post mortem interval). Group I (early PMI): rats were subdivided into 6 equal subgroups; Group (Ia), (Ib), (Ic), (Id), (Ie) and (If) were examined at PMIs of (zero, 3, 6, 9, 12 and 24 hours, respectively). Group II (intermediate PMI): rats were subdivided into 3 equal subgroups: Group (IIa), (IIb) and (IIc) were examined at PMIs of (2, 4 and 6 days, respectively). Group III (delayed PMI): rats were subdivided into 4 equal subgroups: Group (IIIa), (IIIb), (IIlc) and (IVd) rats were examined at PM interval of (1, 2, 3 and 4 weeks, respectively)

Experimental parameters: Prostate was dissected, divided into two portions, and left at room temperature. At each scheduled post mortem interval one portion was prepared for light microscopic examination. The other portion was subjected to DNA extraction and agarose gel electrophoresis.

Results: light microscopic examination of prostate samples didn’t detect any structure abnormality during the first twelve hours post mortem (PM). Twenty four hours PM significant epithelial disruption, inflammatory cells and fatty degeneration began to appear in the prostatic acini. Two days PM, the prostatic acini showed significant atrophy and necrosis. By six days PM, stromal calcification started to appear. One week to four weeks PM, the prostatic acinar epithelial disruption, atrophic acini, necrosis and stromal calcification became extensive till no more normal glandular or fibromuscular architecture can be detected. The results of extracted glandular DNA showed that DNA resisted the degradation up to twenty four hours PM. Thereafter, PM degradation patterns progressed to small pieces of low molecular weight DNA less than 400 bp detected at six days PM then to more degraded DNA to reach less than 100 bp at three weeks PM. Four weeks PM, there was complete disappearance of small fragmented molecules. According to the results of this study, it can be concluded that histopathological changes as well as DNA degradation of the prostate were sequential PM processes that are time based. So, they may be used as a predictor of PMI. The slower degeneration of prostate DNA offers a preferable tool for forensic studies at delayed PMI than the hitopathological examination of the same organ.

Plasma MiRNA-208b as a biomarker for detection of cardiotoxicity induced by cardiovascular drugs poisoning

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Background: Poisoning by cardiovascular drugs has harmful effects and may lead to morbidity and mortality. In cases of myocardial injury, circulating miRNA-208 levels elevate after their leakage into the bloodstream at an early stage of myocardial insult. This study aims to assess the possible role of miRNA-208b in the early detection of myocardial injury in acute intoxicated patients with cardiovascular drugs such as doxigin, beta blockers and calcium channel blockers.

Methods: This study enrolled 40 patients with cardiovascular drug toxicity admitted to the Poison Control Center of Ain Shams University Hospitals (PCC-ASUH) from January 2016 to December 2016 in addition to 40 healthy subjects as the normal control group. Blood samples for miRNA-208b determination and troponin were collected on admission for the patients group and in the early morning for the control group. The demographic and clinical data were collected for every patient.

Results: Age and sex distribution revealed that most of studied patients were in the age group of 14- 24 years accounting for 50% with female predominance 85%. Beta blockers toxicity was the commonest cardiovascular drug toxicity (50%) followed by digitalis (35%) then calcium channel blockers (15%).