

Mature Male Rats: Histochemical and Immunohistochemical Evidence Effect of Carbon Quantum Dots on Testicular Carbohydrate and Lipid Storages and DNA Damage in

Abstract

Carbon quantum dots (CQDs) are carbon-based nano-materials with a diameter of less than 10 nm that have gained great interest recently regarding their unique bioactivities. This study was implemented to probe the effect of CQDs on testicular oxidative DNA damage as well as carbohydrate and lipid storages in mature male rats. Twenty adult male Wistar rats were assigned into four equal groups including control (0.50 mL normal saline; intra-peritoneally (IP), single dose), CQD1 (2.50 mg k⁻¹; IP, single dose), CQD2 (10 mg k⁻¹; IP, single dose) and CQD3 (40 mg k⁻¹; IP, single dose). All animals were euthanized after 35 days and carbohydrate and lipid storages along with 8-Oxo-2'-deoxyguanosine (8-oxo-dG) synthesis levels in testicular tissue were analyzed through histochemical and immunohistochemical analyses, respectively. Intra-peritoneal injection of CQDs led to significant dose-dependent increase in 8-oxo-dG synthesis and lipid storages levels and carbohydrate storages reduction in testicular tissue compared to the control group. Based on these findings, CQDs have the potential of genetic damage and metabolic disorders induction in mature male rats testicular tissue .

Keywords: Carbohydrate, Carbon Quantum Dots, Lipid, Oxidative Damage, Rat, Testi

