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Original Research Article

Catastrophic consequences of the enormous use of hydroxychloroquine during COVID era on liver and kidney of male albino rats: an *in-vivo* study

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ABSTRACT

Background: Hydroxychloroquine (HCQ) is mainly used for the treatment of malaria but during COVID trial, it was used against coronavirus though no history of the drug is known against SARS COV 2 or any other respiratory ailment. Many case studies showed the adverse effects on liver and kidney in many patients after the exposure of HCQ. The main aim of this study is to know the effect of HCQ drug on the liver and kidney of male albino rat at a range of human equivalent dose that was given during COVID period.
Methods: After institutional animal ethics committee (IAEC) approval, ten male albino rats were obtained and divided into two groups-control and treated. Treated groups receives HCQ through oral gavage for six days and then serum, tissue enzymes and total serum bilirubin were measured. Histopathological study was done from liver and kidney tissue. After that statistical analysis was done.
Results: We found significant increase in enzymes glutamic oxaloacetic transaminase (GOT), glutamic pyruvic transaminase (GPT) and alkaline phosphatase (ALP) in the HCQ-treated rats than in control and this signifies that there might be damages that occurred in liver and kidney. Increased level of bilirubin in HCQ-treated rats indicate hyperbilirubinemia and may be a sign of jaundice or any other hepatic disorder. From histopathological identification we also found liver and kidney tissues got damaged due to exposure of HCQ.
Conclusions: From this study, we can conclude that the exposure of this drug might have led to the impaired function of organs that could have potentiated their ill fate.

Keywords: COVID, Hydroxychloroquine, Liver, Kidney, Histopathology

INTRODUCTION

Hydroxychloroquine (HCQ) is a drug of quinoline group having the chemical formula of $C_{18}H_{26}ClN_3O$. It is a very old drug and it was synthesized in the year 1946 by introducing a hydroxyl group into chloroquine, a drug of Quinolone group derived from the bark of cinchona tree in 1600s.[1-3] Both chloroquine and HCQ are used for the treatment of malaria. Not only for malaria, in the past seven decades these drugs are continuously used to treat rheumatoid arthritis and systemic lupus erythematosus.[3,4] After oral administration of HCQ the gastrointestinal absorption occurs very fast and is sufficient to rise at its peak concentration value in blood in 2-3 hours after dosing.[5] The bioavailability of HCQ is 70-80%.[6] HCQ can accumulate and remains in steady concentration in the body tissues for 4-6 months, but the mechanism of HCQ as an antimalarial drug is still not well established.[7,8] HCQ and chloroquine were approved by the U. S. Food and Drug Administration (FDA) not only as treatment and