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Preparation, characterization and *in-vivo* antiplasmodial activity of magnesium oxide nanoparticles on plasmodium berghei infected mice

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The search for new antimalarial agents remains an illusion to some extent in the global fight against antimalarial drug resistance. Malarial treatments now have taken a toll from single dose regimen to combinations of drugs over a period of three days to intra venous or intra muscular injections for three days followed by oral treatment for another three days. This change is surely a problem and fuels the search for newer and more rapid antimalarial agents. In this research, the potentials of magnesium oxide (MgO) nanoparticles were discovered to the fullest. MgO nanoparticles were synthesized using sol-gel process and characterized using SEM, FTIR and UV-VIS spectral study to confirm the formation and size of the nanoparticles. LD50 were carried out using 13 of the mice and was found to be 1131.4 mg/kg. 20% of this value was used to formulate a graded dose of 20, 10 and 5 mg/ml/kg. Then 30 mice were grouped into five containing six mice each and were inoculated with 0.2 ml of ANKA strain of *Plasmodium berghei* intra-peritoneally and were left for the next seven days before treatment with the graded doses based on their body weight. 20/120 mg/kg standard dose of Artemether/lumefantrine was used as positive control while negative control was given no treatment at all. Data were analyzed using mean percentage parasite clearance rate and with that, MgO nanoparticles showed a remarkable clearance rate of 98.8% just after 24 hours of administration and at the end of the fourth day curative model all the parasites were cleared from the blood but one shizont were seen in two cases. Coartem on the other hand had 81% clearance rate after 24 hours and at the end of the curative model 98% clearance rate was achieved. This clearly showed that MgO nanoparticles are superior in the clearance of the ANKA strain of *Plasmodium berghei* in infected mice than coartem.

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