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Fabrication of iron oxide functionalized with PAMAM dendrimer and glycine for the development of drug delivery carrier against visceral leishmania

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Background: Magnetic nanoparticles (MNPs) have been a subject of great interest in recent years due to their potential biomedical applications as carriers for drug delivery, Among MNPs, superparamagnetic magnetite (Fe_3O_4) has been particularly attractive due to its unique magnetic properties and biocompatibility Thus we have developed the MNPs drug delivery carrier against visceral leishmania.

Methods & Materials: The functionalization of Fe_3O_4 nanoparticles has been done with dendrimer and glycine was carried out in situ during co-precipitation of Fe 2+ and Fe 3+ ions in basic medium. The terminal amino acid on the shell of the magnetic nanocarriers allows us to create functionalized exteriors with high densities of organic moieties (both amine and carboxyl) for encapsulation of drug molecules. The drug-loading efficiency of the nanocarriers is investigated using amphoterecin B as a model drug to evaluate their potential as a carrier system.

Results: Results and high loading affinity of nanocarriers for antileishmanial drug, their sustained release profile and during in vitro study, the mean 0.0801 ± 0.0251 of extracellular promastigote of amphoterecin B is significantly higher than MNPs encapsulated amphoterecin B 0.1129 ± 0.01499.

Conclusion: Study signifies that there is an increased contact surface area of the drug and significant reduction in size, improved its efficacy than that of amphotericin B against visceral leishmania and invitro study also showing high affinity at low dose,Further this nanoformulations will be also good candidate as drug carriers for other infectious disease.

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Analysis of dose regimens efficacy of Dihydroartemisine-piperaquine in adults and children suffering from acute malaria in Cameroon

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Background: Dihydroartemisinin piperaquine is increasingly recommended for antimalarial treatment; however concerns have been raised over its potential under dosing in children.The objectives of this study was to investigate the influence of different dosing schedules on Dihydroartemisinin piperaquine efficacy

Methods & Materials: A three-day treatment was performed in subjects weighting at least 5.5 kg presenting with a malaria confirmed by parasitaemia $\geq$ 2000/µl. Patients were allocated into one of different regimens dose according to bodyweight range.The primary endpoint was the PCR adjusted risk of *P. falciparum* recrudescence at the end of study. Secondary endpoints included the new infections, parasitological clearance and gametocytemia. Data were pooled using a standardized methodology. Risk factors for parasite recrudescence were identified.

Results: 100 patients were included in the study. The overall cure rates after correcting for reinfection by parasite genotyping was 97.2% at day 28. In under 5 years children it was 93.8%.The median dose administered was 6.3 mg/kg for Dihydroartemisine, and 50.3 mg/kg for Piperaquine. Overall, 22.5% of patients received Dihydroartemisinin and 23.7% received Piperaquine below WHO recommended doses. Under five years children were at the greatest risk of being exposed to doses of Dihydroartemisinin < 6 mg/kg and Piperaquine < 48 mg/kg, the lower limits recommended by WHO compared to infants younger than 1 year and Children of 5 to 14 years.

Concerning Early Parasitological Response the overall parasitemia rate decreased from 53.2% on day 1 to 12.1% on day 2 and 1.7% on day 3. It was higher in children < 5 years compared to older children and adults. Concerning Late Parasitological Response 11.8% patients had recurrent parasitemia of whom 2.8%, confirmed by PCR as true recrudescence.Six risk factors were associated with recrudescence fby day 28: Piperaquine dose, age, body weight, gametocytemia and haemoglobin.

Conclusion: Dihydroartemisinin piperaquine had demonstrated an excellent efficacy however young children were vulnerable to inadequate dose of Piperaquine, associated with recrudesceence and gametocytemia. These data suggest further studies for confirming that increasing the dose of Dihydroartemisinin and Piperquine is likely to improve the cure rate in young children and increase gametocytemia.

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