Abstract

Introduction and Goal

Leishmaniasis is a zoonotic disease and also it is one of the serious problems in global health that is widespread in the tropical and subtropical areas. Not only it may cause several dangerous and mortal clinical signs, but also, the treatment is limited because of the side effects and drug resistance. Thus, pharmaceutical development is essential. In this research, a series of tetrahydropyrimidine derivatives were designed and synthesized. In order to increase efficiency and reduce costs and time, biginelli method in acidic medium was used to synthesize compounds. Finally, the anti-leishmaniasis effect of synthesized compounds was investigated under *in vitro* tests against promastigotes and amastigotes forms of the *major Leishmaniasis*. Then, the toxicity of these compounds against macrophages was evaluated.

Materials and Methods

In this project, a series of 1,2,3,4-tetrahydropyrimidine derivatives were designed, synthesized and purified. Their structural identification was performed by ^{1}H-NMR, FT-IR and Mass spectra. Their antiparasitic effect was investigated on standard strain (MRHO/IR/75/ER) of major Leishmaniasis.

Results

Among 1,2,3,4-tetrahydropyrimidine derivatives against amastigot and promastigot forms of *major Leishmaniasis*, GN4 with IC_{50} equal to 11.33 µg/ml and GN5 with IC_{50} equal to 3.74 µg/ml showed the highest activity. Also almost screened compounds showed slight toxicity against macrophages.

Discussion and conclusion

According to the results, the type of groups in *para*-phenyl ring at C4 position of tetrahydropyrimidine ring, lipophilicity character, the length of the ester chain at C5 position of tetrahydropyrimidine ring and the type of atoms at C2 position of tetrahydropyrimidine ring had positive effect against promastigot and amastigot forms of parasite. Although these compounds are less effective than standard anti-leishmaniasis drugs, they can lead to more effective compounds.

Keywords

Leishmaniases, 1,2,3,4-tetrahydropyrimidine, Biginelli method