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Pain at insertion of the levonorgestrel-releasing intrauterine system in nulligravida and parous women with and without cesarean section

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Background: Despite the high contraceptive effectiveness and non-contraceptive benefits there are still concerns of use of the levonorgestrel-releasing intrauterine system (LNG-IUS) in nulligravida women. The pain at insertion is one of the limitations to spray the use of IUD. The aim of this study was to evaluate ease of insertion and pain at insertion of the LNG-IUS in nulligravida women compared to parous women. We also classified the types of difficulty at insertion according to each group.

Methods: Three groups were constituted: One with 23 nulligravida women, one with 28 parous women with previous cesarean and another with 23 parous women without previous C-section who received an LNG-IUS. The pain at insertion was evaluated by patients after insertion on the visual pain score. The ease of insertion was evaluated as easy or difficult by the health professional after insertion, and classified according to the type of difficulty: Cervical stenosis, uterine irregularity, women pain.

Results: Almost all patients reported pain at insertion, independent of parity and delivery form. The pain score media was the same in all groups (6.57 vs. 5.17 vs. 5.89). Despite reporting pain about 93% of women also referred that they would submit themselves to LNG-IUS insertion once again if necessary. In nulligravida the type of difficulty most common was cervical stenosis, in parous women with C-section was uterine cavity irregularity, in parous women without C-section was pain. There was no failure of insertion in any group. Professionals classified that it was easier to perform insertion in parous women without C-section. Cervical stenosis was related to higher pain scores.

Conclusions: Although almost all women referred pain at insertion, almost all women would submit to the Lng-IUS again. This reflects high satisfaction with the IUS-LNG. Type of difficulty is related to parity and delivery form. It was possible to insert the IUS-LNG in all patients, but it was easier among parous women without C-section.

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Formulation and evaluation of ion and pH activated smart gel for sustained ocular drug delivery of olopatadine hydrochloride

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The present investigation deals with the formulation and evaluation of ion and pH activated smart gel of olopatadine hydrochloride to increase pre-corneal residence time so as to get sustained ocular drug delivery in the treatment of allergic conjunctivitis. In the present work, Carbopol 934P and gellan gum were used as gelling agent that produce immediate gelation in presence of environmental stimuli like pH and ions. Different formulations were prepared with varying concentrations of Carbopol 934P and gellan gum. These formulations were evaluated for the parameter like appearance, pH, viscosity, *in vitro* gelation study, sterility test and stability studies. In this study, the *in vitro* release profile depends on the concentration of Carbopol 934P and gellan gum. A 32 Full factorial design was applied to check the effect of varying the concentration of Carbopol 934P (X1) and gellan gum (X2) on the dependent variable i.e. drug release after 1 hr (in percentage) Y1, drug release after 6 hrs (in percentage) Y2, and viscosity (cps) Y3. Regression analysis and analysis of variance were prepared for dependent variables. Formulation F4 was considered optimum which contain 0.25% Carbopol 934P and 0.4% gellan gum. In conclusion, the optimum concentration of polymers results in minimized drug loss and sustained drug release. On the basis of these findings, prepared smart gel may be considered as a viable alternative to conventional olopatadine hydrochloride eye drops.

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