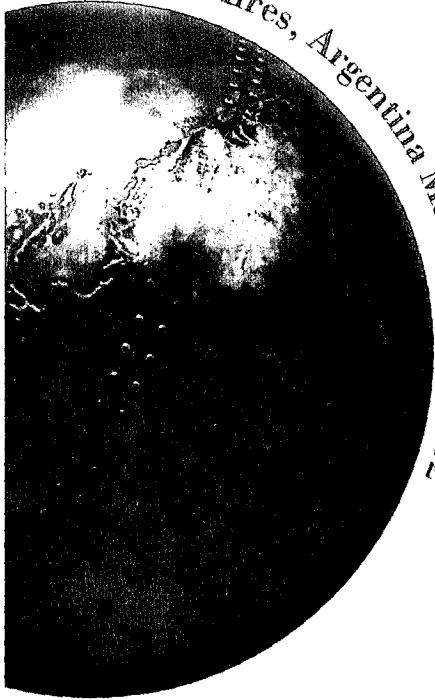


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hMG (6). A randomized controlled trial by Daya et al (11) found a significantly higher fertilization rate with FSH vs hMG; however, though there was a trend for higher PRs with FSH, there was not a significant difference. Another study by Jansen et al, also found higher PRs and implantation rates with rFSH vs hMG. Thus, whether the adjunct of LH is necessary, somewhat beneficial, or detrimental has been an ongoing matter of debate (12).

Studies evaluating comparisons of FSH stimulation versus mixture of FSH and preparations with some LH content have been hard to find. One study by Mercan et al (13) found that the use of FSH alone produced better quality oocytes than FSH/hMG combined. Another study comparing rFSH to rFSH and 75 IU of rLH found a trend for higher clinical PR per transfer with rFSH alone (68.8% vs 45.5%) (18). Recently another study, in contrast to previous ones favoring all FSH stimulation, found no difference in PRs with IVF whether stimulation was with rFSH or hMG (15).

A study by Check et al did not find any difference in PRs with 300 IU rFSH vs 150 rFSH mixed with 150 hMG (16). Interestingly unexpectedly, the PRs were even higher with mixed gonadotropins in women whose mean serum LH during the early follicular phase was greater than the median of 4mIU/mL (16).

The study presented here re-evaluated another series of patients stimulated with rFSH vs rFSH and hMG but in this study evaluated the brand of rFSH.

## **Materials and Methods**

A retrospective study was conducted where the luteal phase leuprolide-gonadotropin regimen was used. The results were evaluated separately for women age  $\leq 39$ . The data was evaluated according to whether the female partner used hMG with Follistim (group 1, 138 transfers) hMG with Gonal-F (group 2, 113 transfers), Follistim only (group 3, 25 transfers) and Gonal-F only (group 4, 60 transfers). The choice of medication was usually based on economics; if insurance covered the cost, all rFSH was given, and if not the mixture of hMG/FSH was given to save money. In all instances a total of 300 IU daily of gonadotropin was initiated in two divided doses.

## **Results**

The mean age (34.1, 34.3, 34.4, and 34.3) fertilization rate (65.1%,

66.5%, 63.4%, and 64.0%) and mean number of embryos transferred (3.1, 3.2, 3.1, and 3.2) were similar. The clinical PRs per transfer were similar in groups 1-3 (47.8%, 43.4%, 44.0%) but lower in group 4 with all Gonal-F (36.7%). The viable PR per transfer (live fetus at end of first trimester) was similar in groups 1 and 3 (44.2%, 44.0%), showed a trend to be lower in group 2 with use of Gonal-F and hMG (38.1%), and was significantly lower in group 4 (31.7%) which received all Gonal-F ( $p < .05$ ). Implantation rates were similar in groups 1-3 (23.7%, 23.4%, 21.8%) but lower in group 4 (18.2%) ( $p < .05$ ). Embryo morphology of transferred embryos was similar in all 4 groups.

## Conclusions

A study by Horsman et al compared biological, immunological and physico-chemical comparison of clinical batches of the rFSH preparations Gonal-F and Puregon (Follistim) (17). The study found that Gonal-F and Follistim were similar in terms of immunopotency, in vitro biopotency and internal carbohydrate complexity. However they differed slightly in charge heterogeneity with Gonal-F having slightly more acidic glycoforms (17). The authors concluded that these two recombinant hormone preparations are intrinsically very similar, and they would not expect any difference in clinical efficacy on the basis of their respective structures (17).

However, despite the prediction of equal efficacy the results of the present study suggested that the exclusive use of Gonal-F resulted in lower PRs and implantation rates than Follistim. Addition of hMG to the Gonal-F COH protocol seemed to obviate the disadvantage of using Gonal-F alone.

These results also showed that mixing the COH regimen with 50% hMG does not decrease PRs or implantation rates. This is important to know since hMG is less expensive than rFSH and thus the patient could at least reduce the cost somewhat by using a mixed protocol.

The conclusions of the current study that use of Gonal-F for COH results in lower PRs and implantation rates are not consistent with the study by Harlin et al who found similar PRs with the two preparations (18).

Similar to our study Harlin et al found no differences in fertilization rates nor did they find any differences in serum estradiol, endometrial thickness, follicle number, or number of retrieved oocytes (18).

The data presented here suggest that the exclusive use of Gonal-F vs Follistim for COH using a luteal phase leuprolide acetate protocol lowers rather than increases the PRs and implantation rates. This effect seems to be on the uterine environment since fertilization rates were comparable as was morphology.

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