

Investigation of exogenous GnRH and opioid antagonists, alone and in combination, on gonadotropin and ovulatory responses in transitional mares under various progesterone environments



E. G. Stafford*, C. D. Sinclair, J. M. Kouba, J. S. Stevenson and J. Grady
Department of Animal Sciences and Industry, Kansas State University, Manhattan

Introduction

- Opioids have been shown to play a role in the seasonal anestrous state of mares by inhibiting GnRh.
- Progesterone priming has been used in transitional mares previously.
- Naloxone (Nal), an opioid antagonist, can cause an increase in LH and FSH in mares when administered. (Behrens et al. 1993; Irvine et al. 1994, Schlote et al. 1994, Davison et al., 1998).
- Naloxone has been shown to increase LH levels during high progesterone environments (Kouba, 2001).
- Deslorelin (Des), a GnRH agonist, is commonly used to promote ovulation in normally cycling mares, and has been previously used in anestrous mares (Williams et al., 2012).
- It is notoriously hard to predict ovulation in transitional mares, and conception rates are normally low (Hanlon, 2012).

Objective

The objective of this experiment was to observe gonadotropin response in transitional mares after administering 1 of 3 different treatments under 3 different progesterone environments, the response of the first ovulatory follicle, and the subsequent conception rates.

Experimental Procedures

- 18 transitional mares started on the project. 2 ovulated shortly after the first phase and therefore could not complete Phase 2, and another was eliminated because samples could not be collected.
- Of the remaining 15, the mares were randomly divided into 3 groups of 5. Each group was assigned a different treatment, either Des (1 ml), Nal (0.5 mg/kg BW), or both.
- All mares received 14 days of progesterone priming in the form of Regu-Mate when they had at least 3 follicles greater than or equal to 20 mm in size.
- At the end of the 14 days of Regu-Mate, when exogenous progesterone was high, mares entered Phase 1.
- During each phase, blood was drawn via an IV catheter every 15 min over a 6 hr collection period; 1 hr pre-treatment as a baseline, and 5 hrs post-treatment. Blood samples were centrifuged and plasma was harvested and frozen for later analyzation.
- After Phase 1, when the mares grew their first potentially ovulatory follicle (>35mm), they had Phase 2 performed, when both exogenous and endogenous progesterone levels were presumably low.
- All mares were bred (AI) to the same stallion of known fertility the day following Phase 2.

Experimental Procedures (cont)

- Mares were bred on fresh semen every other day until ovulation was confirmed.
- Phase 3 occurred 7 d post-ovulation, when endogenous progesterone was high.
- Pregnancy checks were completed at 14 d post-ovulation.

Conclusions

- This experiment is still ongoing and all results are only for a portion of the mares.
- Analyzation of the frozen plasma will occur later in the summer and will test for LH, FSH, and progesterone levels.
- So far, the group receiving both Nal and Des have taken less time for follicles to reach an ovulatory size (Fig 1) and less time for those follicles to ovulate following Phase 2 (Fig 2).
- Conception rates initially seem lower for the group of mares receiving both treatments. However, at the time of writing this, more than a third of the pregnancy checks have yet to be completed.
- No real conclusions can be drawn until the remainder of the results are back.

Experimental Results

Figure 1: Days between Phase 1 and Phase 2

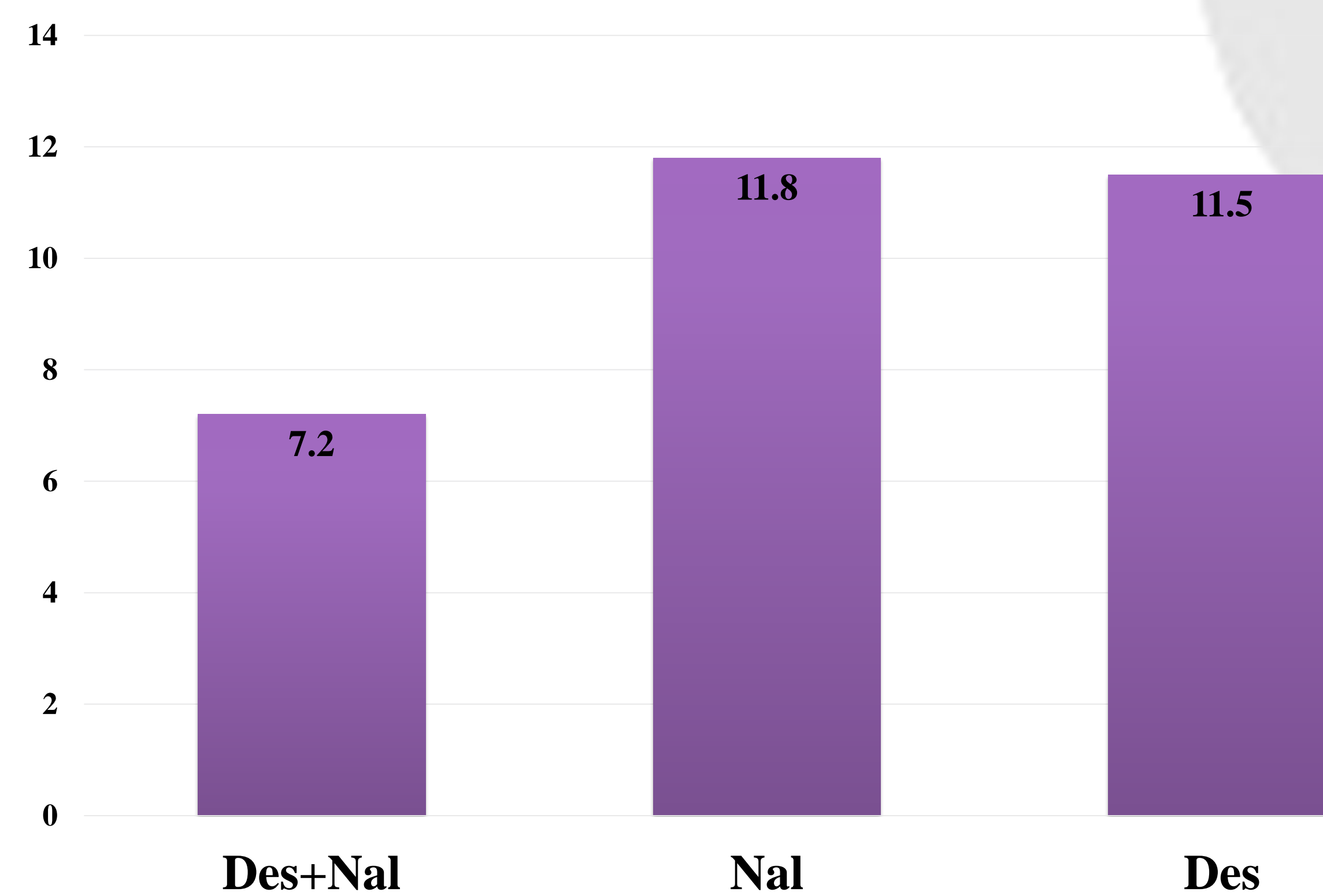


Figure 2: Days between Phase 2 and Ovulation

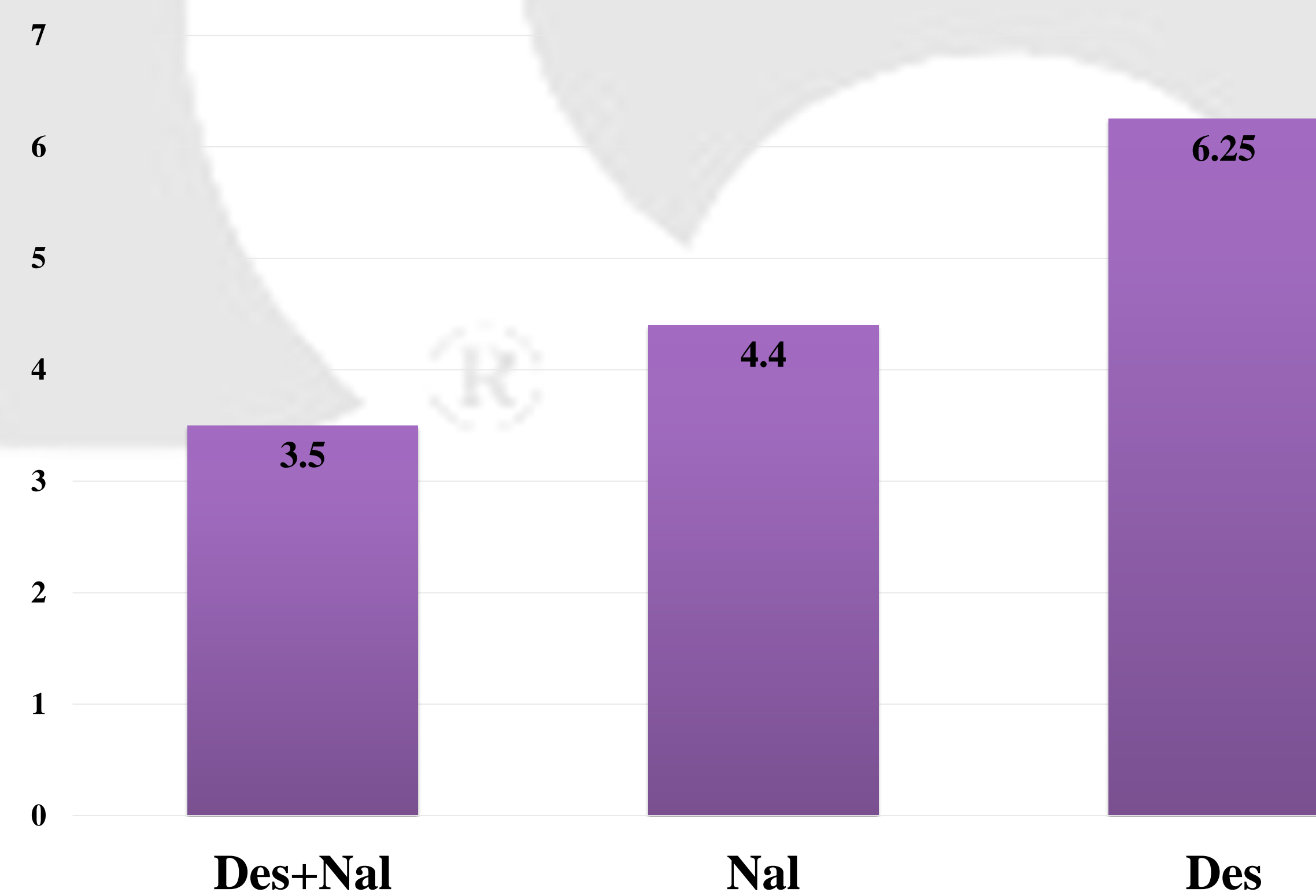


Figure 3: Conception Rates

