Effects of a depot progestin on spermatogenesis in postnatal pigs

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The search of alternatives for sterilization of boars has been the most recent trend for research for animal welfare activists. Although surgical castration has been the normal practice on swine farms to eliminate the possibility of boar taint, concerns are being raised regarding the pain associated with the surgical removal of testes. The objective of the study was to investigate chemical sterilization of pigs as an alternative to surgical castration. The primary goal was to determine if a single exposure of a subcutaneous administration of a depot progestin, depot medroxyprogesterone acetate (Depo Provera®, Pfizer Inc., New York, NY) in postnatal pigs will eliminate Leydig cell proliferation and production of high testosterone levels that can result in boar taint. Additionally, seminiferous tubules were evaluated at the end of the study to determine the effects of the depot progestin on spermatogenesis in the peri-pubertal boars. Crossbred boars (n=15) were administered a single injection of time-released progestin at 10 weeks of age and monitored weekly and biweekly for serum testosterone and androstenedione levels as well as testis size measured by calipers. Control boars were treated with a saline injection at 10 weeks of age. Animals were sacrificed at 26 weeks of age and testicular tissue obtained and fixed in Bouin’s fixative, embedded in paraffin, sectioned, placed on slides and stained with hematoxylin and eosin. Data from weekly and biweekly collections were analyzed using a repeated measures MANOVA using SAS (SAS 9.1, SAS Inc., Cary, NC). A chi-square analysis was performed to compare number of spermatids found in the lumen of the seminiferous tubules. The results of this project reveal that testis size of postnatal boars treated with medroxyprogesterone acetate is significantly decreased (P < 0.001) over time compared to control boars. The reduction in testis size was not pronounced enough that personnel could not tell that it was an intact male. Testosterone and androstenedione assays via radioimmunoassay indicated that both hormone levels were decreased significantly (P < 0.05) for 4-6 weeks post-treatment, but then returned to pre-treatment levels and were comparable to control boars. Additionally, body weights of the treated and control boars remained similar (P > 0.05) throughout the study. Histological evaluation of the seminiferous tubules revealed a trend (P = 0.06) for diminished spermatogenesis with the treated boars having fewer spermatids. These results confirm that synthetic progesterone can suppress testosterone production, testis development of treated animals, but these effects are reversible as the boar reaches puberty and the weight for slaughter in the U.S. Correct timing and dosage for treatment of postnatal pigs with depot progestin still needs to be evaluated.

Keywords: Swine, depot, progestin, castration, medroxyprogesterone acetate.

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