

TESTICULAR RESPONSIVENESS TO GONADOTROPHINS IN THE DEVELOPING BOAR

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It is well established that pituitary gonadotrophins and testosterone are necessary for initiation and maintenance of spermatogenesis in domestic animals (Steinberger 1971). After a transient increase in the second week of life semen concentrations of LH and testosterone in the boar stay low until puberty (Colenbrander and Van Straaten 1977). It appears that in the boar - similarly to the bull - an increase in testosterone secretion and initiation of spermatogenesis is associated with changes in the testicular sensitivity to gonadotrophins occurring at puberty rather than with the increase in the plasma levels of LH and FSH (Schanbacher 1979).

In this study we examined the testicular responsiveness of the developing boar to human (hCG) and equine chorionic gonadotrophin (eCG, PMSG). The aims of the study were: (1) to determine the effect of age on testicular sensitivity to gonadotrophin stimulation and (2) to establish if there are differences between hCG and eCG in their effect on testosterone production.

Materials and Methods

Seventy-five boars of Landrace-Large White cross were used. Groups of boars (5 boars per age and treatment group) from 10 to 26 weeks of age were injected intramuscularly with either hCG or eCG (PMSG) at the rate of 20 I.U. per kg bodyweight. The control groups received saline. Blood samples were collected prior to the injections and 24 hours later. The increases in plasma testosterone concentration 24 hours after injection were used as indicators of testicular sensitivity to gonadotrophins.

Results and Conclusion

Plasma levels of testosterone before and after gonadotrophin stimulation are shown in Tables 1 and 2. The results indicate that the testosterone production after stimulation with gonadotrophins differs between the age groups. It increases gradually to reach normal levels at 22 weeks of age. Human chorionic gonadotrophin (hCG) was twice as active as equine (eCG, PMSG) in stimulating testosterone production in all age groups. The present results support the data from other species and man that the maximal testicular sensitivity to gonadotrophin stimulation occurs after the onset of puberty (Winter *et al* 1972, Mahoudeau *et al* 1975). The differences for the sensitivity of testicles to the two gonadotrophins could reflect the specificity of binding of hCG and eCG to the testicular receptors. At present the significance of these differences and their possible correlation with reproductive performance of the individual are under investigation.

Selected References

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Table 1. Plasma testosterone levels (ng/ml mean \pm S.E.) before stimulation with gonadotrophins in the developing boar

Group	AGE (weeks)				
	10	14	18	22	26
A	0.3 \pm 0.1	0.9 \pm 0.2	1.4 \pm 0.5	2.5 \pm 1.0	1.9 \pm 0.3
B	0.4 \pm 0.1	1.2 \pm 0.5	0.8 \pm 0.3	2.2 \pm 0.5	1.2 \pm 0.3
C	0.2 \pm 0.2	1.0 \pm 0.1	0.6 \pm 0.2	2.3 \pm 0.8	2.6 \pm 0.7

Table 2. Plasma testosterone levels (ng/ml mean \pm S.E.) after stimulation with gonadotrophins in the developing boar

Group	AGE (weeks)				
	10	14	18	22	26
A	0.4 \pm 0.1	0.7 \pm 0.2	0.9 \pm 0.2	4.2 \pm 2.4	1.9 \pm 0.2
B	4.5 \pm 0.5	10.7 \pm 2.2	12.7 \pm 1.8	21.2 \pm 6.4	20.3 \pm 2.4
C	1.0 \pm 0.4	6.5 \pm 1.4	7.5 \pm 1.7	10.7 \pm 2.9	10.7 \pm 1.7

- A - Saline treatment
 B - Human chorionic gonadotrophin (hCG)
 C - Equine chorionic gonadotrophin (eCG, PMSG)