Morphological, hormonal and histological modifications induced by immunization against GnRH in stallions

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Immunization against GnRH
Porcine "vaccine" (Europe) (Improvac®) ☞ alternative way to surgical castration

Which effects in stallions?
• on scrotum aspect
• on concentration of steroids in urine
• on blood level of Antibodies

Materials & methods

From a stable of 170 Lusitanian horses (90 stallions 80 geldings) used for historical spectacles
10 non breeding stallions immunised and followed along the study (4 to 15 years old)
+ 3 control stallions non immunised ☛ histological observation
Immunisation : 1ml Improvac® IM 2 x 28 days appart

Materials & methods

Urine samples ☛ steroids measurements
GC-MS/MS (gas chromatography – Mass spectrometry)
• testosterone
• 5(10)-estrene-3β,17α-diol = estrenediol
• 5α-estrane-3β,17α-diol = estranediol
• estradiol-17α
• estradiol-17β
• estrone
• 5α-androstane-3β,17α-diol
• 5α-androstane-3β,17β-diol

Materials & methods

Blood samples ☛ GnRH antibodies titers measurements
Home-made ELISA (LCH)
(negative control samples ☛ 133 non-immunised against GnRH horses)

Optical density (405 nm)
Set of data N=133 horses
Negative control samples (n=133)
Materials & methods

Histological analysis
- classical preparation for histology
- seminal tubes & area
- No Sertoli, Leydig & germinal cells/transversal sections
- ratio No germinal cells/N° Sertoli cells
+ Androgen receptors immunohistochemical staining
+ calculation of Johnsen’s score
  grade of germinal hypoplasia

Results and discussion

Macroscopic evaluation
5 months 10 days > 2nd injection

Evolution of the Scrotal Width (SW)
Results and discussion

Results and discussion

Evolution of [steroids] in urine (GC-MS/MS)
Results and discussion

Evolution of [steroids] in urine (GC-MS/MS)

Results and discussion

Steroidomics / steroid profiling (biostatistiques)
comparison with large population of ◆ geldings, ▼ mares and ▲ stallions

Results and discussion

Histology

Androgene receptors (immunohistochemistry)

Results and discussion

Histology

Jonhson’s score

Conclusion

Improvac® 2x 28 days apart
◆ reversible immunization against GnRH
arrest of secretion of steroids
hypoplasia of seminal tubes  arrest of Sperm Production

BUT variability among stallions
Intensity of effects
Duration of effects (3 to > 7 months)

Tools for the Medication Control Laboratories
◆ detection of misuse of GnRH vaccine in racehorses
In France the immunization against GnRH is prohibited by races rules
Take home message: scrotal evolution

- reversibility
- time to inject a booster?

Efficiency?
- need of 3rd “prime injections”?

Future
Which effects of booster injections?

Always reversible or not?

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Stallion 1 year ago. After gelding for 8 months and now stallion again, Where am I?

Dr I. Listen to you
Behavioural consultation