Evaluation of chemical castration with calcium chloride versus surgical castration in donkeys: testosterone as an endpoint marker

Ahmed Ibrahim1, Magda M. Ali, Nasser S. Abou-Khalil and Marwa F. Ali

Abstract:

Background: For the last few years, researchers have been interested in developing a method for chemical sterilization which may be a better alternative to surgical castration. An ideal chemical sterilant would be one that effectively arrests spermatogenesis and androgenesis as well as libido with absence of toxic or other side effects. Calcium chloride in various solutions and concentrations has been tested in many animal species, but few studies have been evaluated it in equines as a chemical sterilant. So, the objective of this study was to evaluate the clinical efficacy of chemical castration with 20 % calcium chloride dissolved in absolute ethanol in comparison with surgical castration in donkeys based on the changes in the serum testosterone level and the histopathological changes in treated testes. Methods: Twelve clinically healthy adult male donkeys were used in this study. Donkeys were divided randomly and equally into two groups: a surgical (S) group (n = 6) and a chemical (C) group (n = 6). Animals in the (S) group were subjected to surgical castration while those in the (C) group received a single bilateral intratesticular injection of 20 % calcium chloride dissolved in absolute ethanol (20 ml/testis). Animals were kept under clinical observation for 60 days. Changes in animals' behavior and gross changes in external genitalia were monitored daily. Serum concentrations of testosterone were measured prior to treatment and at 15, 30, 45 and 60 days post-treatment. Testicles in the (C) group were examined histopathologically at the end of the experiment. Results: Chemical castration with intratesticular calcium chloride vs. surgical castration failed to reduce serum concentrations of testosterone throughout the whole duration of the study; however it induced orchitis that was evident by focal necrotic areas in seminiferous tubules, cellular infiltration of neutrophils, proliferative intertubular fibrosis with a compensatory proliferation of Leydig cells. Donkeys tolerated the intratesticular injection of calcium chloride. There were no detectable changes in the general health status of the animals with the exception of swelling in external genitalia, scrotal ulcerations and fistulas. Food and water consumption and the gait of animals remained unaffected. Conclusion: Intratesticular calcium chloride can't be considered an effective method for chemical castration in donkeys.

Keywords:

Calcium chloride, Chemical castration, Testosterone, Donkeys

Published In:

BMC Veterinary Research, Vol 12 - No.46, 1-9