In vitro gossypol induced spermatozoa motility alterations in rabbits

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Abstract

The objectives of the present study were to: (i) examine the in vitro dose response of rabbit spermatozoa motility to the antifertility agent gossypol (GOS) and (ii) determine whether filtered (FIL) and unfiltered (UNFIL) GOS differ in their magnitude of effect.

Rabbit semen belonging to adult males (n = 5; 12–14 months) were cultured with UNFIL GOS and FIL GOS (5% solution) and subsequently diluted (1:1–7) for analysis using a Computer Assisted Semen Analyzer (CASA) system in 5 time periods (0, 60, 120,180 and 360 minutes). At Time 0, no significant change in rabbit spermatozoa motility (MOT) and progressive motility (PROG) with GOS FIL was noted, while increases were observed with GOS UNFIL. At Time 60, weak changes were noted for MOT and PROG.

After 120 minutes of culture with both GOS FIL and GOS UNFIL, MOT and PROG decreased significantly in some experimental groups. However, no differences were recorded for both the parameters at Times 180 and 360, with the exception of PROG in the GOS UNFIL category (groups A, B, E, F and G), where a significant decrease was noticed. Detailed evaluation of the distance and velocity parameters revealed reduction in all these studied markers after 60 and 120 minutes of in vitro culture with both GOS FIL and GOS UNFIL, indirectly confirming the PROG decrease. Straightness (STR), linearity (LIN), wobble (WOB), amplitude of lateral head displacement (ALH) and beat cross frequency (BCF) mostly remained unaltered at all time periods for GOS FIL, whereas some minor alterations were noticed in GOS UNFIL category for STR, LIN, WOB, ALH and BCF parameters at Time 0, 60 and 120. The present study confirms the dose and time dependent alterations of rabbit spermatozoa motility parameters by GOS. The GOS dynamics in our experiment shows that rabbit spermatozoa as a biological material can indicate a GOS inhibition of motility.

Obtained data for the first time indicates a higher immobilizing potential of unfiltered GOS in comparison to filtered GOS in its inhibitory action of spermatozoa motility parameters in rabbits.

Keywords: Spermatozoa motility; gossypol; Computer Assisted Semen Analyzer; rabbit.
Influence of elevated ambient temperature upon some physiological measurements of New Zealand White rabbits

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Abstract

This study was conducted to investigate the effect of heat stress (i.e., elevated ambient temperature - Ta; 36 °C ± 3 °C) on growth performance, mortality rate, and on some haematological and biochemical parameters in different categories of gender and age of New Zealand White (NZW) rabbits. Animals were divided into two main groups (control and treatment), in each group there were 56 rabbits: adult females (n = 20), adult males (n = 4), growing females (n = 16), and growing males (n = 16). Results revealed that total and daily feed intake, feed conversion ratio, and total and daily gain in body weight for growing NZW rabbits were affected negatively by elevated Ta. Decreases in feed intake led to less protein biosyntheses and less fat deposition, which led to lower body weight gain. These observations were made in growing and adult rabbits of both genders. Analysis showed that red blood cell (RBC) counts showed alterations. Packed cell volume (PCV) (in adult females and males), white blood cell (WBC) counts (in growing females), lymphocytes (in growing males), monocytes (in growing females and adult males), basophils (in growing females and growing and adult males) were significantly (P < 0.05) decreased, and total proteins (TP) (in adult females), glucose (Glu) (in adult females), and calcium (Ca2+) (in growing males and females) were significantly (P < 0.01) lower in the experimental group. Furthermore, elevated Ta increased the mortality rate (MR) in both age groups. The mortality rate was 30.36% for growing and adult rabbits of the experimental group, compared with 7.14% for the control group, and was 25% for adult compared with 34.38% for growing experimental rabbits. Exposure of NZW rabbits of both ages and genders to elevated ambient temperature (36°C ± 3 °C), negatively affected their internal homeostasis which was reflected in their growth rate and various physiological signs.