Polyclonal VDAC3 antibody decreases human sperm motility: a novel approach to male contraception

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Abstrak

Latar belakang: Voltage dependent anion channel (VDAC) merupakan protein spesifik yang memperantarai transport anion, kation dan ATP dan berperan penting pada motilitas sperma. Penelitian ini bertujuan mengevaluasi pengaruh antibody VDAC3 poliklonal terhadap motilitas sperma manusia.
Metode: Antibodi VDAC3 poliklonal diproduksi dengan mengimunisasi kelinci dengan peptid sintetik spesifi k VDAC3. Serum kelinci sebelum diimunisasi dikoleksi menjadi preimunserum untuk kontrol percobaan. Pengenalan antiserum VDAC3 yang diproduksi terhadap antigen VDAC3 pada sperma dilakukan dengan menggunakan metode western blot. Sperma dengan motilitas baik dari 30 pria fertile dicuci dan diisolasi dengan menggunakan metode Percoll gradient. Evaluasi pengaruh antibody VDAC3 terhadap motilitas sperma dilakukan dengan mengukur kecepatan gerak sperma (detik/0,1 mm) dan menghitung jumlah sperma tidak bergerak (juta/ml) pada 0 menit, 30 menit, 60 menit setelah penambahan antiserum dan preimunserum. Data kecepatan sperma dan jumlah sperma tidak bergerak dianalisis dengan mengunakan program statistic SPSS 13.0.
Hasil: Antiserum VDAC3 dapat mengenali protein VDAC3 pada sperma dan dapat meningkatkan jumlah sperma tidak bergerak setelah 60 menit secara bermakna dibandingkan preimunserum. Kecepatan gerak sperma menurun secara bermakna setelah penambahan antiserum VDAC3 pada menit ke 0, 30 dan 60 dibandingkan dengan preimunserum. Kesimpulan: Antiserum VDAC3 poliklonal dapat menurunkan motilitas sperma manusia, sehingga diharapkan dapat dikembangan untuk vaksin kontrasepsi pria di masa datang.
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Abstract
Background: Voltage dependent anion channels (VDAC) mediate transport of anions, cations and ATP which play an important role in sperm motility. This study was aimed to examine the effect of polyclonal VDAC3 antiserum to human sperm motility.
Methods: Polyclonal VDAC3 antiserum used in this study was produced in rabbits by immunization of VDAC3- specific synthetic peptides. Preimmunserum was collected before immunization and used for control experiment. Recognition of VDAC3 antiserum to antigen in human sperm was performed by western blot. Thirty sperm samples obtained from fertile men which had high quality of sperm motility were washed and collected by Percoll gradient. Sperm motility was assessed by means of evaluation of sperm velocity (seconds per 0.1 mm distance) and the number of unmoved sperm (million per ml) which were observed 0 minute, 30 minutes and 60 minutes after addition of VDAC3 antiserum and preimmunserum as a control. Both data were analyzed by SPSS 13.0 software.
Results: VDAC3 antiserum recognized VDAC3 protein in human sperm. Statistical analysis demonstrated that there were increasing numbers of unmoved spermatozoa after addition of anti-VDAC3 antiserum in vitro for 60 minutes observation compared with preimmunserum (control). We found also that sperm

velocity decreased signifi cantly after giving anti- VDAC3 antiserum in vitro for 0 minute, 30 minutes, and 60 minutes compared with pre-immunee serum (control).
Conclusion: VDAC3 antiserum can decrease motility of human sperm. and may provide a novel principle of male contraception in the future.