

# Efektivitas Antibodi Poliklonal Anti-Voltage Dependent Anion Channel 3 Rekombinan terhadap Motilitas dan Viabilitas Sperma Ejakulat Manusia = Effectivity of Anti-Voltage Dependent Anion Channel 3 Recombinant Polyclonal Antibodies Against Ejaculated Human Sperm Motility and Viability

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## Abstrak

**Pendahuluan:** VDAC merupakan saluran ion pada spermatozoa yang berperan penting dalam pengangkutan ATP, ion, dan metabolit di dalam membran sel. Telah diketahui VDAC3 berperan dalam motilitas sperma. Tujuan dari penelitian ini adalah memproduksi antibodi anti-VDAC3 melawan protein rekombinan hasil ekspresi vektor rekombinan VDAC3 dan menguji efeknya terhadap viabilitas dan motilitas sperma ejakulat manusia.

**Metode:** Protein rekombinan VDAC3 diimunitasikan selama 14 minggu ke 2 ekor kelinci. Kemudian serum kelinci minggu ke -6 diuji dengan metode ELISA untuk mengetahui titer antibodi anti-VDAC3 dalam serum dan serum preimun sebagai kontrolnya. Serum mengandung antibodi anti-VDAC3 dan serum preimun dipaparkan terhadap 22 sampel ejakulat sperma manusia dan dilihat efeknya terhadap parameter motilitas sperma, Velocity Average Path (VAP), Curvilinear Velocity (VCL), dan Velocity Average Path (VAP) dengan menggunakan Computer Assisted Sperm Analysis (CASA), serta uji viabilitas sperma dengan pewarnaan Eosin-Y pada 0, 30, dan 60 menit paparan.

**Hasil:** Terdapat perbedaan bermakna viabilitas sperma ejakulat manusia yang dipapar dengan serum antibodi anti-VDAC3 dibandingkan dengan serum preimun dalam waktu 0, 30, dan 60 ( $p=0,001$ ). Selain itu, terdapat perbedaan presentase motilitas sperma ejakulat yang dipapar dengan serum antibodi anti-VDAC3 dibandingkan dengan serum preimun dalam waktu 0 dan 30 menit ( $p=0,007$ ;  $0,001$ ), sedangkan pada waktu 60 menit tidak bermakna ( $p=0,062$ ). Pengujian terhadap parameter motilitas VAP, VSL, dan VCL, tidak menunjukkan perbedaan bermakna ( $p>0,05$ ).

**Kesimpulan:** Serum antibodi anti-VDAC3 rekombinan dapat menurunkan viabilitas dan motilitas sperma ejakulat manusia

.....Introduction: VDAC is an ion channel in spermatozoa that plays an important role in the transport of ATP, ions and metabolites in the cell membrane, play a role in sperm motility. The aim of this study was to produce anti-VDAC3 antibodies against VDAC3 recombinant protein that expressed in E coli and evaluated their effect on viability and motility parameters of human ejaculate sperm.

**Methods:** The VDAC3 recombinant protein produced then immunized for 14 weeks to 2 rabbits. The VDAC3 antiserum on 6 weeks was tested by ELISA method to determine the VDAC3 antibody titer in serum and preimmune serum as control. Then, this antiserum and preimmune serum were exposed to 22 samples of human sperm ejaculate and evaluated the effect on viability parameters with Eosin-Y staining, percentage of motility, VAP, VCL, and VSL using computer assisted sperm analysis for 0, 30, and 60 minutes of exposure.

**Results:** There were a significant difference in the viability of human ejaculate sperm exposed to anti-VDAC3 antiserum compared to preimmune serum at 0, 30, and 60 minutes ( $p = 0.001$ ). In addition, there

were a significant difference in the percentage of motility of ejaculated sperm that was exposed by anti-VDAC3 antiserum compared to preimmune serum at 0 and 30 minutes ( $p = 0.007$ ;  $0.001$ ; respectively). Furthermore, percentage of motility of ejaculated sperm that was exposed by anti-VDAC3 antiserum compared to preimmune serum at 60 minutes and the effect of antiserum on the VAP, VSL, and VCL parameters did not show any difference ( $p > 0.05$ ).

Conclusions: Anti-VDAC3 antibody could reduce ejaculated sperm motility parameters and decrease ejaculated sperm living cells