

ABSTRACT

Background: Sperm preparation with sedimentation migration technique is rarely applied due to the lack of apparatus. A new device called modified glass, which utilizing the principle of sedimentation migration, has been investigated. The seminal plasma residue in the post-preparation medium has never been studied and compared with other techniques yet. As a further step, it is essential to examine the seminal plasma residue in modified glass to confirm the benefits and safety of using this method on humans. One marker of seminal plasma residue that can be assessed for its presence in the post-preparation medium is zinc.

Objective: This study aimed at comparing the zinc level in the post-preparation medium by using modified glass and direct swim-up (DSU) technique.

Method: This research was conducted at the Laboratory of Medical Biology and Biochemistry of Sains and Technology Faculty of Universitas Airlangga, Surabaya. The research sample was in the form of ejaculates obtained from 8 volunteers. All samples were analyzed for the pre-prepared zinc content and semen analysis based on the WHO edition of the fifth edition. All samples were then divided into two, with a volume of 1 mL for each. A sperm preparation was carried out with a sedimentation migration technique using modified glasses and DSU technique with the addition of a sperm washing medium of 1.3 mL. After the incubation at 37°C and 5% CO₂ for an hour, the results of the preparation was taken 0.5 ml to be analyzed for post-preparation zinc content.

Result: The results of this study revealed that the level of post-preparation zinc using the modified glass was lower than the pre-preparation, and the difference was significant ($p < 0.05$), which was $8.064 \pm 1.185 \mu\text{mol/L}$ vs. $23.604 \pm 13.937 \mu\text{mol/L}$. The level of post-preparation zinc using DSU was lower than the pre-preparation, but the difference was not significant ($14,408 \pm 8,530 \mu\text{mol/L}$ vs. $23,604 \pm 13,937 \mu\text{mol/L}$). The post-preparation zinc level using modified glass was lower than post-preparation of DSU and the difference was significant ($p < 0.05$), which was $8.064 \pm 1.185 \mu\text{mol/L}$ vs. $14,408 \pm 8,530 \mu\text{mol/L}$.

Conclusion: Modified glass gives seminal plasma residues in a post-preparation medium that was lower than DSU.

Keywords: sperm preparation, direct swim-up, migration sedimentation, zinc

ABSTRAK

Preparasi sperma dengan teknik migrasi sedimentasi jarang diaplikasikan karena keterbatasan alatnya. Sebuah alat baru yang bernama gelas modifikasi memanfaatkan prinsip migrasi sedimentasi telah diteliti namun residu seminal plasma dalam medium pasca preparasinya belum pernah diteliti dan dibandingkan dengan teknik lain. Sebagai tahap lanjutan, penting untuk meneliti residu seminal plasma pada gelas modifikasi untuk mengkonfirmasi manfaat dan keamanan penggunaan metode ini pada manusia. Salah satu penanda residu seminal plasma yang dapat dinilai keberadaannya dalam medium pasca preparasi adalah zink. Tujuan penelitian ini adalah membandingkan kadar zink dalam medium pasca preparasi dengan gelas modifikasi dan teknik *direct swim-up* (DSU).

Penelitian ini merupakan penelitian eksperimental yang dilaksanakan di Laboratorium Biologi Kedokteran dan Biokimia FST Universitas Airlangga Surabaya. Sampel penelitian ini berupa ejakulat yang diperoleh dari 8 orang sukarelawan. Semua sampel dilakukan analisis kadar zink dan analisis semen pra preparasi berdasarkan metode WHO edisi ke-V. Semua sample kemudian dibagi menjadi dua dengan volume masing-masing 1 mL dan dilakukan preprasi sperma dengan teknik migrasi sedimentasi menggunakan gelas modifikasi dan teknik DSU dengan penambahan medium pencuci sperma sebanyak 1,3mL. Setelah inkubasi pada suhu 37⁰C dan 5% CO₂ selama 1 jam kemudian tuaian hasil preparasi diambil sebanyak 0,5ml untuk dianalisis kadar zink pasca preparasi.

Hasil penelitian menunjukkan bahwa kadar zink pasca preparasi gelas modifikasi lebih rendah dibanding pra preparasi dan perbedaannya signifikan ($p < 0,05$) yaitu $8,064 \pm 1,185 \mu\text{mol/L}$ vs $23,604 \pm 13,937 \mu\text{mol/L}$. Kadar zink pasca preparasi DSU lebih rendah dibandingkan pra preparasi namun perbedaannya tidak signifikan ($14,408 \pm 8,530 \mu\text{mol/L}$ vs $23,604 \pm 13,937 \mu\text{mol/L}$). Kadar zink pasca preparasi gelas modifikasi lebih rendah dibandingkan pasca preparasi DSU dan perbedaannya signifikan ($p < 0,05$) yaitu $8,064 \pm 1,185 \mu\text{mol/L}$ vs $14,408 \pm 8,530 \mu\text{mol/L}$.

Kesimpulan penelitian ini adalah gelas modifikasi mampu memberikan hasil residu seminal plasma dalam medium pasca preparasi yang lebih rendah dibandingkan DSU.

Kata kunci: preparasi sperma, *direct swim-up*, migrasi sedimentasi, zink