

ABSTRAK

Latar Belakang: Saat ini, prevalensi infertilitas dilaporkan berkisar antara 8-12%, tertinggi di Asia Tenggara. Di Indonesia, kasus infertilitas dan gangguan kesuburan lainnya dapat dijumpai pada setidaknya 10-15% pasangan. Kualitas sel sperma merupakan salah satu faktor yang penting dalam proses fertilisasi, dimana hal tersebut umumnya diregulasi oleh berbagai jenis hormon dan faktor pertumbuhan. Saat ini, beberapa jenis faktor pertumbuhan yang terdapat dalam *platelet-rich plasma* (PRP) telah digunakan sebagai pilihan terapi pada kasus infertilitas.

Tujuan: Penelitian ini bertujuan untuk mengetahui peran pemberian PRP terhadap konsentrasi, motilitas, morfologi, dan indeks fragmentasi DNA sel sperma pada pasangan pria yang akan menjalani program kehamilan.

Metode: Penelitian analitik prospektif dengan desain *pretest-posttest* ini melibatkan 40 pasangan pria yang dipilih melalui metode *consecutive sampling* mulai dari Maret-April 2021 di Halim Fertility Center, Rumah Sakit Ibu dan Anak Stella Maris, Medan, Indonesia. Setiap pasien akan diambil darahnya sebanyak 5 mL untuk PRP serta diminta mengambil sampel semen untuk dianalisa berdasarkan kriteria WHO 2010 dan diperiksa indeks fragmentasi DNA-nya. Semen diproses dengan metode *swim up*, diinkubasikan selama 45 menit, dan diproses kembali hingga menyisakan 0,3 mL sampel. Sampel tersebut kemudian diinkubasikan selama 1 jam dengan 0,2 mL PRP dan dianalisa konsentrasi, motilitas, morfologi, serta indeks fragmentasi DNA-nya.

Hasil: Hasil analisa sampel menunjukkan bahwa konsentrasi sel sperma meningkat setelah diproses ($28,40 \pm 17,66$ juta/mL dan $35,74 \pm 21,37$ juta/mL), motilitas dan motilitas progresif meningkat setelah diproses ($37,90 \pm 15,43\%$ dan $97,40 \pm 1,17\%$; $0,30 \pm 0,65\%$ dan $23,92 \pm 14,75\%$), morfologi meningkat setelah diproses ($2,65 \pm 0,66\%$ dan $4,55 \pm 0,99\%$), serta persentase sel sperma dengan potensi fertilitas yang baik meningkat setelah diproses (65% dan 97,5%). Hasil-hasil tersebut diketahui memiliki nilai yang berbeda secara signifikan ($p=0,000$).

Kesimpulan: Penginkubasian sampel semen dengan *platelet-rich plasma* (PRP) selama 1 jam dapat menghasilkan kualitas sel sperma yang lebih baik.

Kata Kunci: Sel sperma; *platelet-rich plasma*; indeks fragmentasi DNA; infertilitas

ABSTRACT

Background: The prevalence of infertility has been reported to vary from 8-12%, highest in Southeast Asia. In Indonesia, infertility and other fertility disorders can be found in 10-15% couples. Sperm quality has been known as one of the important factors in fertilization, for which it is regulated by various hormones and growth factors. Recently, the growth factors found in platelet-rich plasma (PRP) have been used as a choice of treatment in infertility cases.

Aim: This study aims to assess the role of PRP to sperm concentration, motility, morphology, and DNA fragmentation index in male couples undergoing infertility program.

Methods: This is a prospective analytical study with a pretest-posttest design in 40 male couples chosen through consecutive sampling method from March-April 2021 in Halim Fertility Center, Stella Maris Women's and Children's Hospital, Medan, Indonesia. As much as 5 mL blood sample would be drawn from each patient for PRP and each of them were asked to collect a semen sample to be assessed using the WHO 2010 criteria and to assess the sperm DNA fragmentation index. Semen was processed by using the swim up method, incubated for 45 minutes, and reprocessed, leaving only 0.3 mL of sample. The sample was incubated with 0.2 mL of PRP for an hour and then re-assessed for sperm concentration, motility, morphology, and DNA fragmentation index.

Results: The results showed that sperm concentration was found higher after processing (28.40 ± 17.66 million/mL vs 35.74 ± 21.37 million/mL), motility and progressive motility were higher after processing ($37.90 \pm 15.43\%$ vs $97.40 \pm 1.17\%$; $0.30 \pm 0.65\%$ vs $23.92 \pm 14.75\%$), morphology was better after processing ($2.65 \pm 0.66\%$ vs $4.55 \pm 0.99\%$), and the percentage of sperm with good fertilization ability was higher after processing (65% vs 97.5%). The results were found significant ($p=0.000$).

Conclusion: Incubating the semen sample with PRP for an hour may yield better sperm quality.

Keywords: Sperm; platelet-rich plasma; DNA fragmentation index; infertility