

ABSTRACT

Background: Infertility affects approximately 8–12% of couples worldwide, with male factors contributing to nearly 50% of cases. Sperm morphology examination is a critical parameter in evaluating male fertility and is conventionally performed using the Papanicolaou staining method based on World Health Organization (WHO) strict criteria. However, laboratories still use alternative staining methods such as Diff-Quik and Safranin–Crystal Violet in routine practice.

Objective: This study aimed to compare spermatozoa morphology assessment results obtained using Papanicolaou, Diff-Quik, and Safranin–Crystal Violet staining methods.

Methods: This analytical observational study used a comparative approach and included 17 semen samples from PKU Muhammadiyah Gamping Hospital. Each sample was prepared into three smears and stained using Papanicolaou, Diff-Quik dan Safranin-Kristal Violet. The study analyzed the data using the Friedman test followed by the Wilcoxon post-hoc test.

Results: The analysis revealed significant differences among the staining methods ($p < 0.05$). Diff-Quik produced lower percentages of normal morphology and higher proportions of head defects, while neck and tail defects appeared lower. In contrast, Safranin–Crystal Violet yielded results closer to Papanicolaou, particularly in normal morphology and tail defects ($p > 0.05$), although staining consistency varied.

Conclusion: Diff-Quik tends to shift morphology assessment results compared to Papanicolaou, whereas Safranin–Crystal Violet produces results closer to the standard method but remains limited by staining inconsistency.

Keywords: sperm morphology examination, Papanicolaou, Diff-Quik, Safranin–Crystal Violet

ABSTRAK

Latar Belakang: Infertilitas memengaruhi sekitar 8–12% pasangan secara global, dengan faktor pria berkontribusi sekitar 50%. Penilaian morfologi sperma merupakan parameter penting dalam evaluasi fertilitas dan secara standar dilakukan menggunakan metode Papanicolaou berdasarkan *Strict Criteria* dari WHO. Praktik laboratorium dilapangan masih menggunakan metode alternatif seperti Diff-Quik dan Safranin–Kristal Violet.

Tujuan: Mengetahui perbedaan hasil pemeriksaan morfologi spermatozoa pada metode pewarnaan Papanicolaou, Diff-Quik, dan Safranin–Kristal Violet.

Metode: Penelitian observasional analitik dengan pendekatan komparatif dilakukan pada 17 sampel semen di RS PKU Muhammadiyah Gamping. Setiap sampel dibuat tiga apusan dan diwarnai menggunakan Papanicolaou, Diff-Quik dan Safranin-Kristal Violet. Analisis data menggunakan uji Friedman dan uji lanjut Wilcoxon.

Hasil: Terdapat perbedaan signifikan antar metode ($p < 0,05$). Diff-Quik menunjukkan morfologi normal lebih rendah dan cacat kepala lebih tinggi, sedangkan cacat leher dan ekor lebih rendah. Safranin–Kristal Violet menunjukkan hasil yang mendekati Papanicolaou pada morfologi normal dan cacat ekor ($p > 0,05$), tetapi kualitas pewarnaan tidak selalu konsisten.

Kesimpulan: Diff-Quik menunjukkan pergeseran hasil dibandingkan Papanicolaou, sedangkan Safranin–Kristal Violet lebih mendekati metode standar tetapi masih memiliki keterbatasan teknis.

Kata kunci: pemeriksaan morfologi spermatozoa, Papanicolaou, Diff-Quik, Safranin–Kristal Violet