

ABSTRAK

STUDI IMUNOHISTOKIMIA *PROLIFERATING CELL NUCLEAR ANTIGEN* (PCNA) TESTIS SAPI PASUNDAN NORMAL DAN *CRYPTORCHIDISM*

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Sapi pasundan merupakan ternak ruminansia lokal Indonesia yang memiliki peran penting dalam ketahanan pangan dan pelestarian sumber daya genetik. Kelainan perkembangan seperti *cryptorchidism* menyebabkan testis terpapar suhu tubuh yang lebih tinggi sehingga dapat mengganggu spermatogenesis melalui penurunan proliferasi sel germinal. Penelitian ini bertujuan untuk mengevaluasi dan membandingkan ekspresi *Prolifering Cell Nuclear Antigen* (PCNA) sebagai penanda proliferasi sel germinal pada testis normal dan *cryptorchidism*. Penelitian ini menggunakan 4 sampel testis sapi pasundan yang terdiri atas 2 testis normal dan 2 testis *cryptorchidism* yang diproses melalui pembuatan preparat histologi dengan pewarnaan *Hematoxylin–Eosin* (HE) dan imunohistokimia (IHK) menggunakan antibodi PCNA. Analisis dilakukan secara deskriptif kualitatif dan kuantitatif berdasarkan persentase sel positif PCNA pada tubulus seminiferus dengan metode skoring, yaitu skor 0 (tidak ada), skor + (<10%), skor ++ (10–50%), dan skor +++ (51–80%). Hasil penelitian histomorfologi menunjukkan bahwa testis normal memiliki struktur tubulus seminiferus yang tersusun teratur dengan lapisan sel germinal lengkap. Ekspresi PCNA terlokalisasi pada inti sel, terutama pada spermatogonia dan spermatosit primer, dengan distribusi ekspresi yang lebih teratur dan merata pada testis normal dibandingkan *cryptorchidism*. Analisis kuantitatif menunjukkan bahwa persentase sel positif PCNA pada testis normal ($55,9 \pm 4,74$) lebih tinggi dibandingkan *cryptorchidism* ($21,0 \pm 4,85$) dengan perbedaan signifikan ($p < 0,05$), skor rata-rata masing-masing termasuk kategori +++ dan ++. Penelitian ini menyimpulkan bahwa kondisi *cryptorchidism* menyebabkan penurunan proliferasi sel germinal yang berdampak pada terganggunya spermatogenesis, sehingga data ekspresi PCNA dapat digunakan sebagai dasar dalam evaluasi fungsi dan pengelolaan reproduksi ternak jantan sapi pasundan.

Kata kunci: *cryptorchidism*, PCNA, proliferasi, sapi pasundan, testis

ABSTRACT

IMMUNOHISTOCHEMICAL STUDY OF PROLIFERATING CELL NUCLEAR ANTIGEN (PCNA) IN NORMAL AND CRYPTORCHID TESTES OF PASUNDAN CATTLE

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Pasundan cattle are an indigenous Indonesian ruminant breed that play an important role in food security and the conservation of genetic resources. Developmental disorders such as cryptorchidism expose the testes to higher body temperatures, which may impair spermatogenesis through decreased proliferation of germ cells. This study aims to evaluate and compare the expression of Prolifering Cell Nuclear Antigen (PCNA) as a marker of germ cell proliferation in normal and cryptorchid testes. A total of four testicular samples from Pasundan cattle were used, consisting of two normal testes and two cryptorchid testes. Histological preparations were performed using Hematoxylin–Eosin (HE) staining and immunohistochemistry (IHC) with anti-PCNA antibodies. The analysis was conducted descriptively using qualitative and quantitative approaches based on the percentage of PCNA-positive cells in seminiferous tubules. The scoring system was defined as follows: score 0 (no positive cells), score + (<10%), score ++ (10–50%), and score +++ (51–80%). Histomorphological results showed that normal testes had well-organized seminiferous tubules with complete layers of germ cells. PCNA expression was localized in the nuclei, primarily in spermatogonia and primary spermatocytes, with a more uniform and regular distribution in normal testes compared to cryptorchid testes. Quantitative analysis demonstrated that the percentage of PCNA-positive cells in normal testes (55.9 ± 4.74) was higher than in cryptorchid testes (21.0 ± 4.85), with a significant difference ($p < 0.05$). The mean scores were categorized as +++ for normal testes and ++ for cryptorchid testes. In conclusion, cryptorchidism is associated with decreased germ cell proliferation, which may lead to impaired spermatogenesis. Therefore, PCNA expression can be utilized as a basis for evaluating testicular function and reproductive management in male Pasundan cattle.

Keywords: cryptorchidism, PCNA, proliferation, Pasundan cattle, testis