

**PERBANDINGAN GAMBARAN FIBROSIS GINJAL ANTARA PULASAN
HEMAKTOSILIN EOSIN DAN SIRIUS RED PADA TIKUS MODEL *UNILATERAL
URETERAL OBSTRUCTION* YANG DIBERIKAN *LACTOCOCCUS LACTIS D4***



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ABSTRAK

PERBANDINGAN GAMBARAN FIBROSIS GINJAL ANTARA PULASAN HEMAKTOSILIN EOSIN DAN SIRIUS RED PADA TIKUS MODEL *UNILATERAL* *URETERAL OBSTRUCTION* YANG DIBERIKAN *LACTOCOCCUS LACTIS D4*

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Pendahuluan: Fibrosis ginjal merupakan manifestasi akhir penyakit ginjal kronis. *Lactococcus lactis* memiliki mekanisme anti-inflamasi yang diduga berperan dalam terapi ginjal fibrotik. Penelitian sebelumnya menilai efek anti-fibrosis *L. lactis* menggunakan pewarnaan Sirius red, sedangkan studi dengan pewarnaan hematoksilin-eosin (H&E), yang lebih umum tersedia di fasilitas kesehatan, masih terbatas. Perbandingan antara kedua metode pewarnaan tersebut juga jarang dilaporkan.

Tujuan: Mengetahui perbandingan gambaran fibrosis ginjal antara pulasan H&E dan Sirius red pada tikus model *unilateral ureteral obstruction* (UUO) yang diberikan *Lactococcus lactis* D4. Metode: Penelitian ini merupakan studi eksperimental laboratorium dengan desain *post-test only randomized control group* menggunakan tikus jantan Sprague Dawley berusia 6–7 minggu. Fibrosis ginjal diinduksi melalui UUO. Subjek dibagi menjadi tiga kelompok, yaitu kontrol (laparotomi), UUO tanpa terapi, dan UUO dengan pemberian *L. lactis* D4. *Lactococcus lactis* D4 diperoleh dari ekstraksi dadih dan diberikan secara rektal dengan dosis 8×10^9 CFU/mL sebanyak 0,5 mL selama tujuh hari.

Hasil: Persentase fibrosis ginjal pada kelompok kontrol dan UUO lebih tinggi dibandingkan kelompok perlakuan berdasarkan pewarnaan H&E maupun Sirius red. Tidak ditemukan perbedaan antara kedua pewarnaan pada kelompok kontrol dan UUO. Namun, pada kelompok perlakuan terdapat perbedaan bermakna, dengan Sirius red menunjukkan nilai fibrosis lebih rendah.

Kesimpulan: Pemberian *Lactococcus lactis* D4 menurunkan derajat fibrosis ginjal. Perbedaan antara pewarnaan H&E dan Sirius red hanya terlihat pada fibrosis minimal, dengan Sirius red lebih spesifik.

Kata kunci: fibrosis ginjal, obstruksi ureter unilateral, *Lactococcus lactis*, hematoksilin-eosin, Sirius red

ABSTRACT

COMPARISON OF RENAL FIBROSIS BETWEEN HEMATOXYLIN EOSIN AND SIRIUS RED STAINS IN RATS MODEL OF UNILATERAL URETERAL OBSTRUCTION ADMINISTERED WITH LACTOCOCCUS LACTIS D4

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Introduction: Renal fibrosis represents the final common pathway of chronic kidney disease. The anti-inflammatory properties of *Lactococcus lactis* have been suggested to attenuate renal fibrogenesis. Most previous studies evaluating its anti-fibrotic effects used Sirius red staining, whereas studies employing hematoxylin-eosin (H&E), a more widely available stain in clinical practice, remain limited. Comparative data between these two staining methods are also scarce. **Objective:** To compare renal fibrosis assessed by H&E and Sirius red staining in a rat model of unilateral ureteral obstruction (UUO) treated with *Lactococcus lactis* D4.

Methods: This experimental laboratory study employed a post-test-only randomized control group design using 6–7-week-old male Sprague Dawley rats. Renal fibrosis was induced by UUO. Rats were divided into three groups: control (laparotomy only), P1 (UUO), and P2 (UUO plus *L. lactis*). *Lactococcus lactis* D4, isolated from dadih, was administered rectally at a dose of 8×10^9 CFU/mL (0.5 mL) for seven days following UUO induction.

Results: Renal fibrosis percentages assessed by H&E and Sirius red were significantly higher in the control and UUO groups compared to the treated group. No significant differences between staining methods were observed in the control and UUO groups. However, a significant discrepancy between H&E and Sirius red staining was found in the treated group, indicating different sensitivities at minimal fibrosis levels.

Conclusion: *Lactococcus lactis* administration resulted in minimal renal fibrosis. Differences between H&E and Sirius red staining were evident only in mild fibrosis, with Sirius red demonstrating higher specificity.

Keywords: renal fibrosis, unilateral ureteral obstruction, *Lactococcus lactis*, hematoxylin-eosin, Sirius red

