

ABSTRAK

PENGARUH SUPLEMEN KALSITRIOL TERHADAP GAMBARAN HISTOPATOLOGIK GINJAL TIKUS DEWASA OSTEOPOROSIS YANG DIINDUKSI PAKAN FOSFOR TINGGI

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Konsumsi fosfor tinggi menyebabkan hiperfosfatemia, hipokalsemia, osteoporosis, dan nefrosis akut. Hiperfosfatemia dapat menekan produksi kalsitriol. Penelitian ini dilakukan untuk mengkaji pengaruh suplemen kalsitriol terhadap histopatologi ginjal tikus dewasa osteoporosis yang diinduksi fosfor tinggi.

Dua puluh tikus Wistar betina dewasa umur delapan minggu dibagi menjadi empat kelompok (N_k , OS_k , OS, dan OS_{40}). Tikus N_k diberi pakan standar sedangkan tikus OS_k , OS dan OS_{40} diinduksi osteoporosis dengan diberi pakan fosfor tinggi selama delapan minggu. Pasca induksi osteoporosis, tikus N_k dan tikus OS_k dieutanasi, ginjal kanan diambil untuk pemeriksaan histopatologi, sedangkan tikus OS diberi pakan standar, dan tikus OS_{40} diberi pakan standar + kalsitriol 40ng/tikus/hari secara oral selama lima minggu. Pada akhir penelitian, tikus OS dan OS_{40} dieutanasi, ginjal kanan diambil untuk pemeriksaan histopatologi dengan pengecatan *Hematoxylin Eosin*.

Hasil pemeriksaan histopatologi ginjal tikus dewasa kelompok N_k terlihat normal, ginjal tikus kelompok OS_k terjadi nefrosis akut yang ditandai dengan timbunan massa protein dalam glomerulus dan lumen tubulus ginjal, serta atrofi pada epitel tubulus ginjal. Tikus dewasa osteoporosis kelompok OS terlihat lebih sedikit timbunan massa protein dalam glomerulus dan lumen tubulus ginjal, lebih sedikit vakuolisasi dan atrofi pada beberapa epitel tubulus ginjal dibandingkan dengan tikus kelompok OS_k . Ginjal tikus dewasa osteoporosis kelompok OS_{40} terlihat sedikit timbunan massa protein dalam glomerulus, pada lumen tubulus ginjal tidak ada timbunan massa protein, tidak terdapat vakuolisasi dan atrofi pada epitel tubulus ginjal jika dibandingkan dengan tikus dewasa osteoporosis kelompok OS. Berdasarkan hasil penelitian disimpulkan bahwa suplementasi kalsitriol 40ng/tikus/hari pada tikus dewasa osteoporosis yang diinduksi pakan fosfor tinggi selama lima minggu dapat memperbaiki struktur mikroskopik nefrosis akut ginjal hingga mendekati normal.

Kata kunci: Ginjal, osteoporosis, fosfor tinggi, kalsitriol.

ABSTRACT

EFFECTS OF CALCITRIOL SUPPLEMENTATION ON THE HISTOPATHOLOGICAL KIDNEY PICTURE OF OSTEOPOROTIC ADULT RATS WHEN INDUCED WITH A HIGH PHOSPHORUS FEED

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High phosphorus consumption causes hyperphosphatemia, hypocalcemia, osteoporosis, and acute nephrosis. Hyperphosphatemia may suppress calcitriol production. This study was conducted to examine the effect of calcitriol supplementation on the histopathological picture of the kidneys of osteoporotic rats when induced with a high phosphorus feed.

Twenty adult female Wistar rats aged eight weeks were divided into four groups (N_k , OS_k , OS, and OS_{40}). The N_k rats were given a standard feed while the OS_k , OS and OS_{40} rats had osteoporosis induced by a high phosphorus feed for eight weeks. The post-osteoporosis induced, N_k and OS_k rats were euthanized and had their right kidneys removed for histopathological examination, while the OS rats were given a standard feed and the OS_{40} rats were given standard feed plus calcitriol at 40ng/rat/day orally for five weeks. At the end of the study the OS and OS_{40} rats were euthanized and had their right kidneys removed for histopathological examination using Hematoxylin Eosin dye.

The results of the histopathological examination of the kidneys of adult rats of the N_k group appeared normal, whereas the OS_k rat kidneys showed acute nephrosis, which was characterized by a large mass of proteins in the glomeruli and lumen of the renal tubules, and atrophy of the renal tubule epithelium. Osteoporotic adult rats in the OS group showed a smaller mass of protein deposits in the glomeruli and lumen of the renal tubules, less vacuolization and atrophy in some renal tubular epithelium compared to the OS_k group of rats. Examination of the kidneys of the osteoporotic rats of the OS_{40} group revealed a slight pile of protein mass in the glomerulus. In the lumen of the renal tubules there was no mass of protein deposits and no vacuolization nor atrophy in the renal tubular epithelium when compared with the osteoporotic rats of the OS group. Based on the results of the study, it was concluded that 40ng/rat/day of calcitriol supplementation in adult osteoporotic rats, when induced with a high phosphorus feed for five weeks, could restore the microscopic structure of acute renal nephrosis to near normal.

Key words: Renal, osteoporosis, high phosphor, calcitriol.