

## **ABSTRAK**

### **PENGARUH ESTROGEN TERHADAP GAMBARAN HISTOPATOLOGIS GINJAL TIKUS OVARIKТОMI PASCA KONSUMSI FOSFOR TINGGI**

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Tingginya asupan fosfor dapat menyebabkan penurunan *bone mineral density* dan peningkatan resorpsi tulang oleh osteoklas yang berperan dalam osteoporosis. Estrogen diketahui dapat meningkatkan aktivitas osteoblas tulang dan mengurangi risiko patah tulang pada wanita pascamenopause maupun tikus ovariektomi, oleh sebab itu penelitian ini bertujuan untuk mengetahui pengaruh estrogen terhadap histopatologis ginjal tikus ovariektomi pasca konsumsi fosfor tinggi.

Sepuluh ekor tikus *Wistar* betina umur 8 minggu dibagi dua kelompok, yaitu tikus ovariektomi yang diberi pakan fosfortinggi kemudian dilanjutkan pakan standar (TS), dan tikus ovariektomi yang diberi pakan fosfor tinggi kemudian dilanjutkan pakan standar dan suplementasi estrogen *conjugated* 25µg/tikus/hari (TE). Satu minggu pasca adaptasi lingkungan, dilakukan induksi osteoporosis dengan ovariektomi pada tikus TS dan TE. Satu hari pasca ovariektomi, kelompok tikus TS dan TE diberi pakan fosfor tinggi selama tujuh minggu. Setelah tujuh minggu, kelompok tikus TS diberi pakan standar, sedangkan kelompok tikus TE diberi pakan standar dan suplemen estrogen *conjugated* 25µg/tikus/hari secara oral selama lima minggu. Pada akhir perlakuan, seluruh tikus dietanasi, kemudian ginjal kiri diambil dan difiksasi dengan formalin 10% untuk pemeriksaan histopatologis dengan pewarnaan HE.

Hasil pemeriksaan histopatologis ginjal tikus TS menunjukkan adanya nefrosis ringan, yaitu terjadi hipertrofi ringan pada glomerulus, epitel tubulus mengalami atrofi dan vakuolisasi sehingga menunjukkan penyebaran bentuk tubular *cyst*, adanya sedikit endapan massa protein di ruang kapsul Bowman, serta terjadi atrofi epitel kapsul Bowman. Histopatologis ginjal tikus TE menunjukkan glomerulus dan epitel tubulus mendekati normal, ruang kapsul Bowman bersih namun beberapa tubulus masih ada endapan protein. Kesimpulan, pemberian estrogen *conjugated* 25µg/tikus/hari selama lima minggu pada tikus ovariektomi pasca konsumsi fosfor tinggi dapat memperbaiki struktur ginjal sehingga mendekati normal.

Kata kunci : Estrogen, fosfor tinggi, ginjal, osteoporosis, tikus ovariektomi

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### **THE EFFECT OF ESTROGEN ON HISTOPATHOLOGICAL VIEW OF KIDNEY IN OVARIETOMY RATS WITH HIGH PHOSPHORUS**

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High phosphorus intake can cause the decrease of bone mineral density and the increase of bone resorption by osteoclasts that play a role in osteoporosis. Estrogen is able to increase bone osteoblast activity and reduce the risk of fractures in postmenopausal women and ovariectomized rat, therefore, this research was aimed to study the effect of estrogen on kidney histopathological figure of ovariectomized rats after taking high phosphorus diet.

Ten female Wistar rats at 8 weeks of age, were divided into two groups, ovariectomized rats fed high phosphorus diet then followed by standard diet (TS), and ovariectomized rats fed high phosphorus diet then followed by standard diet with 25µg/rat/day conjugated estrogen supplementation (TE). One week after environmental adaptation, osteoporosis was induced with ovariectomy in TS and TE rats. One day after ovariectomy, TS and TE rats were given high phosphorus diet for seven weeks. After seven weeks, TS rats were given standard diet, while TE rats were given standard diet and 25µg/rat/day conjugated estrogen supplementation orally, for five weeks. At the end of the treatment, all rats were euthanized, then the left kidney was taken and fixed with 10% formalin for histopathological examination with HE staining.

Histopathological examination of TS rats was showed mild nephrosis, mild hypertrophy of glomerulus, tubular epithelium had atrophy and vacuolization, thus showing the spread of tubular cyst form, the presence of protein mass in the Bowman capsule space, and atrophy of Bowman's capsule epithelium. Kidney histopathological figure of TE rats was showed glomerular and tubular epithelium close to normal, Bowman's capsule space was clean but several tubules still had protein mass deposits. Conclusion, administration of 25µg/rat/day conjugated estrogen for five weeks in ovariectomized rats after fed high phosphorus diet can improve kidney structure close to normal.

**Keywords:** Estrogen, high phosphorus, kidney, osteoporosis, ovariectomy rat