

ABSTRAK**MEKANISME PENCEGAHAN INFLAMASI SALURAN NAFAS YANG TERPAJAN UAP METIL METAKRILAT DENGAN PEMBERIAN 1,8-SINEOL****Sianiwati Goenharto**

Tujuan: Untuk menjelaskan mekanisme pencegahan inflamasi saluran nafas yang terpajan uap MMA dengan pemberian inhalasi 1,8-sineol, dengan menganalisis jumlah sel epitel yang mengekspresikan SOD, CAT dan MDA, serta jumlah sel makrofag yang mengekspresikan NF- κ B, IL-8, IL-10 serta jumlah neutrofil. **Metode:** Tiga puluh ekor mencit, dibagi 5 kelompok yaitu kelompok kontrol normal (K0), kelompok kontrol negatif (K1) dan kelompok perlakuan yang diberi 1,8-sineol 5 mg, 10 mg dan 15 mg (P1, P2 dan P3). Setelah perlakuan mencit diterminasi dan jaringan saluran nafas (paru) diambil. Pengamatan ekspresi SOD, CAT, MDA, NF- κ B, IL-8, dan IL-10 dilakukan dengan pemeriksaan imunohistokimia, sedangkan pengamatan inflamasi jaringan dilakukan pada preparat HE dengan menghitung banyaknya neutrofil. Selain itu dilakukan uji in silico menggunakan program *Molegro Virtual Docker 5.5*. **Hasil:** Penelitian in silico menunjukkan bahwa *Moldoc score* 1,8-sineol (-49,1236) lebih rendah dari ligan diklofenak/ COX-2 (-106,8010), demikian juga *Moldoc score* 1,8-sineol (-42,7930) lebih rendah dari ligan TLR-2/ CAS_673 (-56,5640). Paparan MMA meningkatkan ekspresi SOD, MDA, IL-8, jumlah neutrofil dan menurunkan IL-10 secara bermakna ($p < 0,05$), tetapi ekspresi CAT tidak berbeda bermakna. Pemberian 1,8-sineol 5 mg, 10 mg dan 15 mg mampu menurunkan SOD, CAT, MDA. Hanya pada dosis 15 mg, pemberian 1,8-sineol mampu menurunkan ekspresi NF- κ B dan IL-8 sehingga menjadi tidak berbeda dengan kelompok kontrol normal. Dosis 10 mg dan 15 mg meningkatkan ekspresi IL-10. Pada pemberian 1,8-sineol 5 mg, 10 mg dan 15 mg sudah terjadi penurunan jumlah neutrofil, meskipun masih didapatkan perbedaan yang bermakna baik dengan K0 maupun K1 ($p < 0,05$). **Kesimpulan:** 1,8-sineol mempunyai potensi anti inflamasi secara in silico dan dapat mencegah inflamasi dengan meregulasi ekspresi SOD, CAT, menurunkan MDA, IL-8 serta meningkatkan IL-10 pada jaringan saluran nafas mencit yang terpajan uap MMA.

Keywords: MMA, 1,8-sineol, inflamasi, in silico

ABSTRACT**PREVENTION MECHANISM OF AIRWAY INFLAMMATION THAT WAS EXPOSED TO METHYL METHYLLATE BY 1,8-CINEOLE INHALATION***Sianiwati Goenharto*

Objective: To explain the 1,8-cineole prevention mechanism of airway inflammation exposed to MMA vapor, by analyzing the expression of SOD, CAT, MDA, NF- κ B, IL-8, IL-10 and neutrophil counts. **Methods:** Thirty mice (BALB/c) were divided into 5 groups: the normal control group (K0), negative control group (K1) and the treatment group were given 5 mg, 10 mg and 15 mg 1,8-cineole (P1, P2 and P3). Observation was done on lung tissue and measurement of SOD, CAT, MDA, NF- κ B, IL-8, and IL-10 expression was carried out by immunohistochemical examination. Observation of tissue inflammation was carried out by calculating the number of neutrophils. In addition, *in silico* tests were carried out using the Molegro Virtual Docker 5.5 program. **Result:** *In silico* study showed that Moldock score of 1,8-cineole (-49,1236) was lower than diclofenac / COX-2 ligand (-106.8010), as well as Moldock score of 1,8-cineole (-42.7930) was lower than TLR-2 / CAS_673 (-56,5640) ligand. MMA exposure significantly increased SOD, MDA, IL-8, neutrophil counts and decreased IL-10 ($p < 0.05$), but CAT expression was not significantly different. Administration of 1,8-cineole 5 mg, 10 mg and 15 mg can reduce SOD, CAT, MDA. Only at a dose of 15 mg, 1,8-cineole was able to reduce the expression of NF- κ B and IL-8 so that it did not differ from K0 group. At doses of 10 mg and 15 mg, there was an increase in IL-10 expression. Administration of 1,8-cineole 5 mg, 10 mg and 15 mg has decreased the number of neutrophils, although significant differences were still found with K0 and K1 ($p < 0.05$). **Conclusion:** *In silico*, 1,8-cineole has been predicted to have anti-inflammatory potential. 1,8-Cineole can prevent airway inflammation by regulating the expression of SOD, CAT, decreasing MDA, IL-8 and increasing IL-10 of mice exposed to MMA vapor.

Keywords: MMA, 1,8-cineole, inflammation, *in silico*