Studi deteksi 8-hidroksi-2'-deoksiguanosin dan 1-hidroksipiren dalam urin sebagai biomarker risiko kanker akibat paparan polycyclic aromatic hydrocarbon dari asap kebakaran hutan di Dumai = Study of urinary 8-hydroxy-2'-deoxyguanosin and 1-hydroxypyrene detection as biomarkers of cancer risk due to polycyclic aromatic hydrocarbon exposure from woodsmoke of forest fire In Dumai

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Abstrak

Kebakaran hutan dan lahan menghasilkan asap yang diketahui mengandung Polycyclic Aromatic Hydrocarbon (PAH). Efek adanya kerusakan oksidatif pada DNA akibat paparan asap kebakaran hutan dan lahan terhadap risiko kanker diselidiki melalui deteksi biomarker 8-Hidroksi-2’-Deoksiguanosin (8-OHdG) dan 1-Hidroksipiren (1- OHP), metabolit utama piren, sebagai indikator paparan PAH dalam urin. Analisis biomarker paparan PAH dalam urin 24 jam dilakukan secara acak dalam suatu populasi di Kota Dumai, Provinsi Riau. Kandungan 8-OHdG dalam sampel urin dianalisis menggunakan HPLC detektor UV dengan fasa gerak buffer natrium fosfat 0,1 M pH 6,7 dan metanol (85:15, v/v). Sementara, kandungan 1-OHP dalam urin dideteksi menggunakan HPLC detektor flourosens dengan eluen metanol dan air (60:40, v/v). Analisis kedua senyawa tersebut dilakukan dengan kromatografi fasa terbalik mode isokratik. Hasil pengujian menunjukan bahwa 8-OHdG terdeteksi pada seluruh sampel dalam rentang konsentrasi 25,29 g/L hingga 2,16 mg/L urin (n = 11), lebih tinggi dibandingkan dengan konsentrasi 8-OHdG dalam urin individu sehat (1,42 g/L – 4,25 g/L). 1-OHP dalam urin juga terdeteksi dalam empat dari lima sampel yang diuji, menandakan bahwa terdapat potensi besar kerusakan oksidatif DNA akibat paparan PAH.....orest fires generate woodsmoke that contain Polycyclic Aromatic Hydrocarbon (PAH). The effect of DNA oxidative damage due to woodsmoke exposure on cancer risk can be investigated through the detection of urinary 8-Hydroxy-2’-Deoxyguanosin (8-OHdG) and 1-Hydroxypyrene, main metabolite of pyrene, as indicators of PAH exposure. Analysis biomarkers of PAH exposure in 24 hours urine was performed within a population randomized in Dumai City, Riau Province. The 8-OHdG levels in urine samples were analyzed by using HPLC with UV detector using sodium phosphate buffer 0.1 M pH 6.7 and methanol (85:15, v/v) as mobile phase. Meanwhile, 1-OHP levels in urine was detected by using a HPLC with fluorosens detector using methanol and water (60:40, v/v) eluent. Analysis of both compounds was performed by reverse phase chromatography with isoratic mode. The results showed that 8-OHdG was detected in all samples with concentration range of 25.29 g/L to 2.16 mg/L urine (n = 11), higher than urinary 8-OHdG of health person (1,42 g/L – 4,25 g/L). Urinary 1- OHP was also detected in four of five samples. It indicates that there was a high potential of DNA damage caused by PAH exposure