Studi Deteksi DNA Adduct (8-OHdG) sebagai Biomarker Risiko Kanker akibat Paparan Akrilamida dan Cu (II) secara In Vivo pada Tikus Galur Sprague dawley dan In Vitro Pada 2-Deoksiguanosin = DNA Adduct Detection Study (8-OHdG) as Cancer Risk Biomarkers due to In Vivo Exposure to Acrylamide and Cu (II) in Mice Sprague Dawley and In Vitro At 2 '-Deoxiguanosine

Chendy Permatasari Wibowo, author

Abstrak

Penelitian ini dilakukan untuk menganalisis pembentukan DNA Adduct 8-OHdG akibat kerusakan oksidatif DNA yang disebabkan oleh paparan akrilamida (1 mg/kg BB) dan Cu (II) (10 mg/kg BB). Studi in vivo dilakukan dengan menggunakan kelompok tikus (Rattus norvegicus) galur Sprague Dawley yang diberi paparan selama 28 hari dan dilakukan pengambilan sampel urin setiap 7 hari. Studi in vitro dilakukan dengan mereaksikan 2-„deoksiguanosin pH 7,4 dengan akrilamida, Cu (II), H2O2 melalui reaksi Fenton-like pada suhu 37 °C. Analisis 8-OHdG dilakukan dengan instrumentasi LC-MS/MS ionisasi positif, fasa terbalik, dengan gradien elusi campuran ammonium asetat 20mM dan asetonitril. Hasil studi in vivo menunjukkan bahwa paparan akrilamida, Cu, dan gabungan akrilamida + Cu (II) mengakibatkan adanya kerusakan DNA yang dapat menimbulkan risiko kanker. Kelompok paparan gabungan akrilamida + Cu (II) menunjukkan kadar yang paling tinggi, hal ini menunjukkan adanya kesinergisan antara akrilamida dan Cu (II) pada pembentukan kadar 8-OHdG. Pengujian kadar 8-OHdG secara berkala menunjukkan kadar 8-OHdG yang semakin meningkat seiring dengan lamanya waktu paparan. Hasil studi in vitro menunjukkan bahwa akrilamida tidak menginduksi pembentukan 8-OHdG secara langsung, melainkan perlu adanya proses metabolisme terlebih dahulu.

.....This study was conducted to analyze the formation of 8-OHdG DNA Adduct due to oxidative DNA damage caused by exposure to acrylamide (1 mg / kg BB) and Cu (II) (10 mg / kg BW). In vivo studies were carried out using a group of Sprague Dawley rats (Rattus norvegicus) that were exposed for 28 days of exposure and urine samples were taken every 7 days. In vitro studies were carried out by reacting 2-oksdeoxiguanosine pH 7.4 with acrylamide, Cu (II), H2O2 through Fenton-like reaction at 37 ° C. The 8-OHdG analysis was performed with positive ionization LC-MS / MS instrumentation, reversed phase system, with a mixture of elution gradient of ammonium acetate 20mM and acetonitrile. The results of in vivo studies showed that acrylamide, Cu, and acrylamide combined Cu (II) exposure caused DNA damage that could cause cancer risk. The exposure group of acrylamide combined Cu (II) combined showed the highest levels, this indicates a synergy between acrylamide and Cu (II) in the formation of 8-OHdG levels. Periodic analysis of 8-OHdG levels shows that 8-OHdG levels are increasing along with the length of time of exposure. In vitro testing shows that acrylamide does not directly induce the formation of 8-OHdG, but rather requires a metabolic process first.