

HUBUNGAN VARIASI GEN *GLUTATHIONE S-TRANSFERASE M1* DENGAN KADAR KROMIUM DARAH: SEBUAH STUDI PADA PEKERJA BATIK KECAMATAN LENDAH KULON PROGO

ABSTRAK

Latar belakang: Kromium merupakan logam berat yang banyak dijumpai di alam maupun sebagai hasil proses industri. Cr(III) merupakan komponen *Glucose Tolerance Factor*, sementara Cr(VI) merupakan karsinogen dan terdapat pada fiksator pewarna batik. Metabolisme kromium dibantu enzim *Glutathione S-Transferase* yang dikode oleh gen *GST*, dengan salah satu subfamili yaitu *GSTM1*. Beberapa subjek dalam populasi memiliki delesi *GSTM1* sehingga metabolisme kromium terganggu. Akumulasi kromium darah dapat memicu penyakit seperti kanker paru, ulserasi saluran pernafasan, dan dermatitis kontak.

Tujuan: Mengetahui hubungan delesi gen *GSTM1* dengan kadar kromium darah pada pekerja batik Kecamatan Lendah, Kulon Progo.

Metode: Penelitian ini merupakan penelitian *cross sectional* dengan data sekunder. Subjek yang diteliti merupakan pekerja batik Kecamatan Lendah, Kulon Progo, dengan jumlah sampel sebanyak 39. Uji *Fisher's Exact Test* dilakukan untuk mengetahui hubungan delesi *GSTM1* dengan kadar kromium darah pekerja batik. Perbedaan rerata dan median kadar kromium darah pada kelompok delesi *GSTM1* diuji dengan *Mann Whitney* dan uji median. Perbedaan rerata kadar kromium darah pada kelompok karakteristik subjek menggunakan *Kruskall Wallis* dan *Mann Whitney*.

Hasil: Sebanyak 7 (17,95%) dari 39 subjek mengalami delesi *GSTM1*. Kadar kromium darah tinggi pada 35 pekerja batik dan normal pada 4 pekerja batik. Enam subjek mengalami delesi *GSTM1* dan kadar kromium darah tinggi. Tidak terdapat perbedaan rata-rata kadar kromium darah pada kelompok usia, lama kerja, IMT, dan jenis kelamin ($P = 0,262; 0,984; 0,164; 0,053$). Tidak terdapat hubungan antara delesi *GSTM1* dengan kadar kromium darah ($p = 0,563$). Tidak ada perbedaan rerata kadar kromium antara kelompok delesi maupun *wild-type GSTM1* ($p = 0,067$).

Kesimpulan: Tidak terdapat hubungan antara delesi gen *GSTM1* dengan kadar kromium darah pada pekerja batik Kecamatan Lendah, Kulon Progo. Kadar kromium darah tinggi pada 35 subjek (89,74%).

Kata Kunci: *GSTM1*, delesi *GSTM1*, glutathione, kromium, metabolisme kromium, toksisitas kromium.

THE CORRELATION BETWEEN *GSTM1* VARIATION AND BLOOD CHROMIUM LEVELS AMONG BATIK WORKERS IN LENDAH DISTRICT, KULON PROGO REGENCY

ABSTRACT

Background: Chromium is a heavy metal that present in nature and as a result of industrial processes. Cr (III) is a component of Glucose Tolerance Factor, while Cr (VI) is carcinogen and found in batik dye fixators. Chromium metabolism is influenced by *Glutathione S-transferase (GST)* which is encoded by the *GST* gene, and one of their subfamilies are *GSTM1*. Some subjects in the population have deletions in *GSTM1* and cause the disturbance of chromium metabolism. Chromium accumulation can trigger some diseases such as lung cancer, respiratory tract ulceration, and contact dermatitis.

Objective: Determine correlation between *GSTM1* deletions and blood chromium levels among batik workers in Lendah, Kulon Progo.

Method: This research was a cross sectional study using secondary data. 39 samples were taken from batik workers in Lendah District, Kulon Progo. Fisher's Exact Test was performed to determine the relationship between *GSTM1* deletions with blood chromium levels in batik workers. Differentiation of mean and median blood chromium levels in *GSTM1* variation group were tested by Mann Whitney and median test. Difference in mean blood chromium levels of each subject characteristics was tested by Kruskall Wallis and Mann Whitney.

Result: 7 (17,95%) subjects had deletions in *GSTM1*. Blood chromium levels were high in 35 batik workers and normal in 4 batik workers. Among 7 subjects who had deletions in *GSTM1*, 6 subjects had high blood chromium levels. No difference of mean blood chromium levels in every group (age, length of work, BMI and gender) ($p=0,262; 0,984; 0,164; 0,053$). No correlation between *GSTM1* deletions with blood chromium levels in batik workers ($p = 0,563$). No difference of mean blood chromium levels between deletions and wild-type groups ($p = 0,067$).

Conclusion: No correlation between *GSTM1* deletions and blood chromium levels among batik workers in Lendah district, Kulon Progo. 35 subjects had high blood chromium levels (89,74%).

Keywords: *GSTM1*, *GSTM1* deletions, glutathione, chromium, chromium metabolism, chromium toxicity.