Korelasi Kadar Timbal dalam Darah dan Kadar 25(OH)D terhadap Kadar hs-Troponin T pada Pekerjaa Terpajan Timbal = The Correlation of Blood Lead Level and 25(OH)D Level on hs-Troponin T Among Lead Exposed Workers

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Abstrak

Latar belakang
Pajanan timbal dapat menjadi stress oksidatif yang memicu peningkatan kadar Troponin T. Di sisi lain, vitamin D mungkin berperan sebagai antioksidan dan cardioprotector dalam menghambat gangguan kardiovaskular. Namun pajanan timbal juga mempengaruhi konversi 25(OH)D sehingga menyebabkan defisiensi vitamin D. Penelitian analisis pendahuluan ini bertujuan untuk menilai korelasi kadar timbal darah (KTD) dan kadar 25(OH)D terhadap kadar hs-Troponin T pada pekerja yang terpajan timbal.
Metode
Penelitian ini menggunakan desain potong lintang yang meneliti 90 pekerja laki-laki terpajan timbal di lingkungan kerja maupun rumah. Sampel darah vena dikumpulkan dari semua subyek penelitian untuk mengukur KTD dengan metode ICP-MS, sedangkan kadar 25(OH)D dan kadar hs-Troponin T menggunakan metode ECLIA di laboratorium. Data hasil penelitian dianalisis dengan uji Spearman untuk menilai korelasi KTD dengan kadar 25(OH)D, KTD dengan hs-Troponin T, dan kadar 25(OH)D dengan kadar hs-Troponin T.
Hasil
Nilai median(min-maks) KTD subyek adalah 7,11(1,17-58,83) µ g/dL, kadar 25(OH)D 22(8- 52) ng/mL, dan kadar hs-Troponin T 4,12(1,5-71,32) pg/mL. Kami menemukan korelasi yang signifikan antara KTD dengan 25(OH)D (r = 0.21, p = 0.046). Tidak terdapat korelasi antara KTD dengan hs-Troponin T (r = 0.07, p = 0,468) dan 25(OH)D dengan hs-Troponin T (r=0.11, p=0,290).
Diskusi
Kemungkinan terjadi pajanan timbal kronik pada subyek, sehingga KTD terkesan rendah. Pajanan timbal kronik dapat menurunkan kadar vitamin D, namun vitamin D melindungi kardiovaskular dari inflamasi akibat pajanan timbal.
Kesimpulan
KTD berkorelasi dengan kadar 25(OH)D, namun tidak berkorelasi dengan hs-Troponin T. Perlu investigasi lebih lanjut untuk menilai hubungan KTD dengan biomarker kardiovaskular pada kelompok pekerja yang terpajan timbal lainnya.
.....Background
Lead exposure can cause oxidative stress which triggers an increase in Troponin T levels. On the other hand, vitamin D may play a role as an antioxidant and cardio-protector in preventing cardiovascular disorders. However, lead exposure also affects the conversion of 25(OH)D to vitamin D which causes vitamin D deficiency. This preliminary analysis study aims to assess the correlation between blood lead levels (BLL) and 25(OH)D levels on hs-Troponin T levels among lead exposed workers.
Method

This cross-sectional study examined 90 male workers who were exposed to lead in their occupation and environment. Venous blood samples were collected from all research subjects to measure adverse events using the ICP-MS method, while 25(OH)D levels and hs-Troponin T levels used the ECLIA method in the laboratory. The data were analyzed by Spearman test to find out the correlation between BLL and 25(OH)D levels, BLL with hs-Troponin T, and 25(OH)D levels and hs-Troponin T levels.

Results

The median(min-max) of subject's BLL was 7,11(1,17-58,83) µ g/dL, while 25(OH)D levels 22(8-52) ng/mL and hs-Troponin T levels 4,12(1,5-71,32) pg/mL. We found a significant correlation between BLL and 25(OH)D ($r=0.21$, $p=0.046$). There was no correlation neither between BLL and hs-Troponin T ($r=0.07$, $p=0.468$) nor 25(OH)D and hs-Troponin T ($r=0.11$, $p=0.290$).

Discussion

The subjects might be exposed to lead chronically, so the BLL seem low. Chronic lead exposure among the subjects decreased 25(OH)D levels, but still protected the cardiac inflammation by lead exposure.

Conclusion

BLL correlates with 25(OH)D levels, but does not correlate with hs-Troponin T. Further investigation is needed to assess the relationship of BLL with cardiovascular biomarkers in other groups of lead exposed workers.