# Hubungan Kadar 25(OH)D Serum dengan Rasio Pyridinoline Crosslinks/Kreatinin Urin pada Pekerja Terpajan Timbel = Correlation of Serum 25(OH)D Levels with Urinary Pyridinoline Crosslinks/Creatinine Ratio in Lead Exposed Workers

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Abstrak

Beban penyakit akibat pajanan timbel terus meningkat. Timbel mengganggu hidroksilasi 25(OH)D dan transportasi kalsium sehingga aktivitas osteoklastik dan resorpsi tulang meningkat. Pyridinoline crosslinks (PYD) sebagai indikator kerusakan tulang lebih dini dari pencitraan. Penelitian ini merupakan penelitian sekunder dari penelitian primer yang berjudul Korelasi Kadar Serum 25(OH)D dengan Penanda Biologis Kardiovaskular pada Pekerja Terpajan Timbel. Penelitian berdesain potong lintang ini dilakukan untuk mengetahui hubungan kadar 25(OH)D serum dengan rasio PYD/kreatinin urin pada pekerja terpajan timbel. Penelitian berlokasi di Kabupaten Tegal, Kabupaten Tangerang, Kota Surabaya, dan Kabupaten Bogor. Subjek adalah bagian dari seluruh pekerja terpajan timbel yang terdaftar sebagai responden dalam penelitian primer dan memenuhi kriteria, didapatkan total 104 subjek. Instrumen yang digunakan adalah formulir karakteristik subjek, pemeriksaan fisik, Global Physical Activity Questionnaire, Semi-Quantitative Food Frequency Questionnaire, hasil pemeriksaan fungsi ginjal dan hepar, kadar timbel dalam darah, kadar 25(OH)D serum, dan sampel urin pagi. Median kadar timbel dalam darah 6,3 (1,2-35,5) µg/dL, indeks pajanan timbel kronik 35,3 (1,2-535,8) tahun µg/dL, kadar 25(OH)D serum 22 (8-52) ng/mL, dan rasio PYD/kreatinin urin 5,3 (3,6-28,1).10<sup>-6</sup>. Sebagian besar (86,5%) subjek memiliki kadar 25(OH)D serum yang tidak adekuat. Studi menunjukkan terdapat hubungan negatif yang signifikan antara kadar 25(OH)D serum dengan rasio PYD/kreatinin urin pada pekerja terpajan timbel ($r = -0,39$, $p < 0,001$), dan terdapat hubungan positif yang signifikan antara indeks pajanan timbel kronik dengan rasio PYD/kreatinin urin ($r = 0,21$, $p = 0,036$).

.....The burden of disease due to lead exposure continues to increase. Lead interferes with 25(OH)D hydroxylation and calcium transport, increasing osteoclastic activity and bone resorption. Pyridinoline crosslinks (PYD) as an indicator of bone damage that can be seen earlier than imaging. This study is a secondary study of the primary study entitled Correlation of Serum 25(OH)D Levels with Cardiovascular Biological Markers in Workers Exposed to Lead. This cross-sectional study was conducted to determine the correlation between serum 25(OH)D levels and the urinary PYD/creatinine ratio in workers exposed to lead. The study was located in Tegal Regency, Tangerang Regency, Surabaya City, and Bogor Regency. The subjects were part of all lead-exposed workers who were registered as respondents in the primary study and met the criteria, resulting in a total of 104 subjects. The instruments used were subject characteristic form, physical examinations, Global Physical Activity Questionnaire, Semi-Quantitative Food Frequency Questionnaire, kidney and liver function test results, blood lead levels, serum 25(OH)D levels, and morning urine samples. Median blood lead levels were 6.3 (1.2-35.5) µg/dL, chronic lead exposure index 35,3 (1,2-535,8) years µg/dL, serum 25(OH)D levels were 22 (8-52) ng/mL, and urinary PYD/creatinine ratio was 5.3 (3.6-28.1).10<sup>-6</sup>. Among the most population (86.5% of subjects) had inadequate serum 25(OH)D  the study showed a significant negative correlation between serum 25(OH)D levels and urinary

PYD/creatinine ratio in workers exposed to lead ($r = -0.39$, $p < 0.001$). There was also a significant positive correlation between chronic lead exposure index and the urinary PYD/creatinine ratio ($r = 0.21$, $p = 0.036$).