

**Pengaruh Asam Lemak Omega-3 terhadap *Collagen Type I Turnover*
pada Pasien Pasca Infark Miokard Akut Elevasi Segmen ST
yang Menjalani Intervensi Koroner Perkutan Primer**

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ABSTRAK

Latar Belakang: Pasca infark miokard akut elevasi segmen ST (IMA-EST), deposisi kolagen pada matriks ekstraseluler (ECM) yang berlebihan memicu remodeling ventrikel yang mengakibatkan disfungsi sistolik dan diastolik. Peningkatan *collagen type I turnover* pada ECM terus terjadi meskipun pasien telah mendapatkan intervensi koroner perkutan primer (IKPP). Omega-3 diketahui memiliki potensi dalam mencegah fibrosis jantung. Belum banyak diteliti peranan Omega-3 pada pasien IMA-EST yang menjalani IKPP.

Metode: Penelitian *open label, randomized pre-post test trial*, melibatkan pasien pasca IMA-EST yang menjalani IKPP yang berhasil, diberikan Omega-3 dosis tinggi (n= 15) atau tidak (n= 15) selama 6 minggu sebagai tambahan medikamentosa standar. *Collagen Type I Turnover* dinilai dengan kadar serum *Carboxy-terminal Propeptide of Procollagen Type I* (PICP) dan *Carboxy-terminal Telopeptide of Collagen Type I* (ICTP) dengan metode ELISA.

Hasil: Total 30 subjek partisipasi (15 kelompok kontrol dan 15 kelompok Omega-3) dengan rerata usia $54,4 \pm 11$ tahun, onset $15,3 \pm 10$ jam, dan didominasi infark anterior (66,7%). Tidak terdapat perbedaan karakteristik klinis dasar pada kedua kelompok. Omega-3 secara signifikan menurunkan kadar PICP serum ($-5,7 \pm 8,0$ ng/ml vs kontrol $+4,0 \pm 14,2$ ng/ml, $p=0,024$). Tidak didapatkan perubahan bermakna kadar ICTP pada kelompok Omega-3 (median 50,9 pg/ml menjadi 52,9 pg/ml, $p=0,245$), sedangkan terjadi kenaikan bermakna kadar ICTP pada kelompok kontrol (median 42,5 pg/ml menjadi 64,9 pg/ml, $p=0,009$). Tidak didapatkan efek samping terkait pemberian Omega-3 dosis tinggi pada studi ini.

Kesimpulan: Omega-3 dapat menghambat *Collagen Type I Turnover* yang terjadi pada pasien pasca IMA-EST yang menjalani IKPP.

Kata kunci: *Omega-3, collagen turnover, biomarker kolagen, infark miokard akut*

Effect of Omega-3 Fatty Acids on Collagen Type I Turnover in Patients after ST Elevation Myocardial Infarction Treated with Primary Percutaneous Coronary Intervention

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ABSTRACT

Background: Following ST Elevation Myocardial Infarction (STEMI), excessive collagen deposition in extracellular matrix (ECM) contributes to ventricular remodelling and development of systolic and diastolic dysfunction. Persistent increase of collagen type I turnover on ECM still found even in patients successfully treated with primary percutaneous coronary intervention (PCI). Omega-3 fatty acids have emerged as a new option to prevent cardiac fibrosis. Study on Omega-3 effects in STEMI patients treated with primary PCI remain limited.

Methods: In an open label, randomized pre-post test trial, including 30 STEMI patients successfully treated with primary PCI were randomly assigned to 6 weeks of high-dose omega-3 fatty acids (n=15) or none (n=15) in addition to optimal standard of care. Collagen Type I Turnover was evaluated using serum levels of Carboxy-terminal Propeptide of Procollagen Type I (PICP) and Carboxy-terminal Telopeptide of Collagen Type I (ICTP) using ELISA method.

Results: A total of 30 subjects participants (15 control group and 15 Omega-3 group) mean aged $54,4 \pm 11$ years, STEMI onset $15,3 \pm 10$ hours, and predominantly anterior infarction (66,7%). There were no differences in baseline clinical characteristics between the two groups. Omega-3 significantly decreases level of serum PICP ($-5,7 \pm 8,0$ ng/ml vs control group $+4,0 \pm 14,2$ ng/ml, $p=0,024$). There were only modest changes of serum ICTP level in Omega-3 group (median 50,9 pg/ml to 52,9 pg/ml, $p=0,245$), meanwhile it significantly increased in control group (median 42,5 pg/ml to 64,9 pg/ml, $p=0,009$). There were no adverse events associated with highdose omega-3 fatty acids therapy in this study.

Conclusions: Omega-3 may attenuate collagen type I turnover in STEMI patients treated with primary PCI.

Keywords: *Omega-3, collagen turnover, collagen biomarker, acute myocardial infarction*