

## ABSTRACT

### THE ROLE OF SERUM CYSTATIN C AS A PREDICTOR OF MAJOR ADVERSE CARDIOVASCULAR EVENTS (MACE) DURING HOSPITALIZATION IN ST-ELEVATION MYOCARDIAL INFARCTION (STEMI) SUCCESSFULLY PERFORMED PRIMARY PERCUTANEOUS CORONARY INTERVENTION (PCI)

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**Background** : ST segment elevation myocardial infarction (STEMI) is one of the spectrum of acute coronary syndromes (ACS) which still main cause of death from cardiovascular disease. Although the success rate of PPCI in handling ACS is quite high, the high MACE rate for STEMI patients is still a major problem in many countries with the incidence rate, especially in Indonesia, around 24-26%. Therefore, it is important to predict the occurrence of outcomes so that appropriate management strategies can be implemented. Cystatin C, apart from being a biomarker of decreased kidney function, is also useful in predicting the prognosis of ACS patients. Cystatin C plays an important role in the chronic inflammatory and extracellular matrix degradation that underlies high levels of cystatin C as a risk factor for poor outcome in STEMI patients.

**Objective:** This study aimed to determine the role of serum cystatin C in predicting the occurrence of MACE during hospitalization of STEMI patients who were successfully carried out by Primary PCI.

**Methods:** This study is a prospective cohort of STEMI patients who were successfully carried out by PPCI and observed the occurrence of an outcome in the form of MACE during hospitalization at RSUP Dr. Sardjito. Types of MACE include of cardiovascular death, post-PPCI stroke, cardiogenic shock, malignant arrhythmias and recurrent myocardial infarction. Sampling with consecutive sampling method to get 85 patients. Cystatin C measurements were performed at the time of admission using the particle-enhance turbidimetric immunoassay (PETIA) method. The cut-off value of serum cystatin C for predicting mortality was determined by analysis of the ROC curve. Bivariate and multivariate analyzes were performed to assess whether high serum cystatin C was an independent predictor of MACE occurrence during hospitalization.

**Results** : Of the 85 subjects, major adverse cardiovascular events during hospitalization occurred in 19 subjects (22.3%). The cut-off value of serum cystatin C was 1.225 mg/L, the area under the curve was 0.724. Bivariate analysis showed that serum cystatin C was high 1.225 mg/L with RR 5.04 (95% CI 1.83 - 13.86 p=0.001). Multivariate analysis showed that serum cystatin C 1.225 mg/L was an independent predictor of MACE during hospitalization with an OR 9.26 (95% CI 1.80 - 47.64 p=0.008) which means that it has a nine times greater risk of MACE during hospitalization compared to subjects with normal cystatin.

**Conclusion:** High serum cystatin C levels on admission are an independent predictor of major adverse cardiovascular events during hospitalization in IMA-EST patients who have successfully undergone Primary PCI.

**Keywords:** Serum cystatin C, major adverse cardiovascular events, ST segment elevation myocardial infarction.

## PERAN CYSTATIN C SERUM SEBAGAI PREDIKTOR KEJADIAN KARDIOVASKULAR MAYOR (KKM) SELAMA RAWAT INAP PASIEN INFARK MIOKARD AKUT ELEVASI SEGMENT ST (IMA-EST) YANG BERHASIL DILAKUKAN INTERVENSI KORONER PERKUTAN PRIMER (IKPP)

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**Latar belakang** : Infark miokard akut elevasi segmen ST (IMA-EST) merupakan salah satu spektrum sindrom koroner akut (SKA) yang masih menjadi penyebab kematian utama penyakit kardiovaskular. Meskipun angka keberhasilan IKPP dalam penanganan SKA cukup tinggi, namun tingginya angka KKM pasien IMA-EST masih menjadi masalah utama di berbagai negara dengan angka kejadian khususnya di Indonesia sekitar 24-26%. Oleh karena itu, penting untuk memprediksi terjadinya *outcome* agar dapat melakukan strategi tatalaksana tepat. Cystatin C selain sebagai biomarker penurunan fungsi ginjal juga bermanfaat memprediksi prognosis pasien SKA. Cystatin C memainkan peran penting dalam proses inflamasi kronis dan degradasi matriks ekstraseluler yang mendasari tingginya kadar cystatin C sebagai faktor risiko *outcome* buruk pasien IMA-EST.

**Tujuan**: Penelitian ini bertujuan untuk mengetahui peran cystatin C serum dalam memprediksi terjadinya KKM selama rawat inap pasien IMA-EST yang berhasil dilakukan IKPP

**Metode**: Penelitian ini merupakan penelitian *cohort prospective* terhadap pasien IMA-EST yang berhasil dilakukan IKPP dan diamati terjadinya *outcome* berupa KKM selama rawat inap di RSUP Dr. Sardjito. Jenis KKM yang dinilai berupa kematian kardiovaskular, stroke pasca tindakan, syok kardiogenik, aritmia maligna dan infark miokard berulang. Pengambilan sampel dengan metode *consecutive sampling* untuk mendapatkan 85 pasien. Pengukuran cystatin C dilakukan saat admisi menggunakan metode *particle-enhance turbidimetric immunoassay* (PETIA). Nilai *cut off* cystatin C serum untuk prediksi kematian ditentukan berdasarkan analisis kurva ROC. Analisis bivariat dan multivariat dilakukan untuk menilai apakah cystatin C serum tinggi merupakan prediktor independen terjadinya KKM selama rawat inap.

**Hasil** : Dari 85 subjek, kejadian kardiovaskular mayor selama rawat inap terjadi pada 19 subjek (22,3%). Nilai *cut off* cystatin C serum adalah 1,225 mg/L, *area under curve* sebesar 0,724. Analisis bivariat menunjukkan bahwa cystatin C serum tinggi  $\geq 1,225$  mg/L dengan RR 5,04 (95% CI 1,83 - 13,86 p=0.001). Analisis multivariat menunjukkan bahwa cystatin C serum  $\geq 1,225$  mg/L merupakan prediktor independen terjadinya kematian selama rawat inap dengan OR 9,26 (95% CI 1,80 - 47,64 p=0.008) yang berarti memiliki risiko sembilan kali lebih besar terjadinya KKM selama rawat inap dibandingkan subjek dengan cystatin normal.

**Kesimpulan** : Kadar cystatin C serum tinggi saat masuk rumah sakit merupakan prediktor independen terjadinya kejadian kardiovaskular mayor selama rawat inap pada pasien IMA-EST yang berhasil dilakukan IKPP.

**Kata Kunci** : Cystatin C serum, kejadian kardiovaskular mayor, infark miokard akut elevasi segmen ST.