Original Article

Impact of the SYNTAX Score on Risk Stratification after Percutaneous Coronary Intervention in Non-Selected Patients

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ABSTRACT

Background: The SYNTAX score was developed as an angiographic tool to grade the complexity of coronary artery disease in patients with three-vessel and/or left main disease. The role of this score in predicting clinical outcomes after percutaneous coronary intervention (PCI) in non-selected patients treated in the daily clinical practice of a referral centre was evaluated. **Methods:** Analysis of patients undergoing PCI from March to September of 2009, and at the 12-month follow-up. Patients were divided into tertiles according to the SYNTAX score. The primary endpoint included major adverse cardiac events (MACE) – death, non-fatal acute myocardial infarction, and target-vessel revascularisation. The ability of the SYNTAX score to predict MACE was assessed by the receiver operator characteristic (ROC) curve. **Results:** Two hundred and thirty four patients with a mean SYNTAX score of 11.6 ± 6.2 points were included. Tertile I had a SYNTAX score ≤ 9 (average 5.9); tertile II, > 9 and ≤ 13 (average 10.8); and tertile III, > 13 (average 18.3). During the clinical follow-up of 7.2 ± 4.9 months, the incidence of MACE was greater in tertile III than in tertiles I and II (2.5% vs. 6.4% vs. 14.1%; P = 0.0075). The ROC curve showed an area under the curve of 0.667 (P = 0.012), indicating a moderate ability to anticipate the occurrence of MACE in this population. **Conclusions:** The SYNTAX score proved to be useful in predicting the occurrence of MACE after PCI in patients treated in clinical practice.

DESCRIPTORS: Coronary artery disease. Angioplasty. Stents. Drug-eluting stents. Prognosis.

RESUMO

Impacto da Utilização do Acesso Radial na Ocorrência de Sangramento Grave entre Idosos Submetidos a Intervenção Coronária Percutânea

Introdução: O escore SYNTAX foi desenvolvido como ferramenta para graduar a complexidade angiográfica da doença arterial coronária em pacientes com acometimento de três vasos e/ou com lesão de tronco. Avaliamos seu papel em predizer desfechos clínicos após intervenção coronária percutânea (ICP) em pacientes não-selecionados, tratados na prática diária de um hospital de referência. **Métodos:** Análise de pacientes submetidos a ICP entre março e setembro de 2009 e acompanhados por até 12 meses. Os pacientes foram divididos em tercis de acordo com o escore SYNTAX. O desfecho primário foi composto de eventos cardíacos adversos maiores (ECAM) – óbito, infarto agudo do miocárdio não-fatal e revascularização do vaso-alvo. O desempenho do escore SYNTAX em predizer ECAM foi avaliado pela curva ROC (*Receiver Operator Characteristic)*. **Resultados:** Foram incluídos 234 pacientes com escore SYNTAX médio de 11,6 ± 6,2 pontos. O tercil I apresentou escore SYNTAX ≤ 9 (média de 5,9); o tercil II, > 9 e ≤ 13 (média de 10,8); e o tercil III, > 13 (média de 18,3). No seguimento clínico de 7,2 ± 4,9 meses, a incidência de ECAM foi maior no tercil III em comparação com os tercis I e II (2,5% vs. 6,4% vs. 14,1%; P = 0,0075). A curva ROC mostrou área sob a curva de 0,667 (P = 0,012), indicando moderada capacidade de prever a ocorrência de ECAM nessa população. **Conclusões:** O escore SYNTAX mostrou ser útil em prever a ocorrência de ECAM em pacientes pós-ICP tratados na prática clínica diária.

DESCRITORES: Doença das coronárias. Angioplastia. Stents. Stents farmacológicos. Prognóstico.

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The SYNTAX score was developed as an angiographic tool to grade the complexity of coronary artery disease (CAD), and it has been used to determine the prognosis of patients with triarterial CAD and/or those with lesions in the left main coronary artery; this score aids decision-making regarding the best revascularisation strategy, whether percutaneous or surgical.[1–4] Recent data also indicate the usefulness of the SYNTAX score to predict the development of periprocedural myocardial infarction in patients undergoing elective percutaneous coronary intervention (PCI).[5]

The SYNTAX study, which first described the score, compared late clinical outcomes in patients with multivessel disease treated with PCI and paclitaxel-eluting stents versus coronary artery bypass graft (CABG) surgery.[2] The unfavourable PCI results in patients with higher anatomic complexity confirmed the limitation of interventionist techniques in such cases.

Even with advances in PCI techniques and the availability of new devices, such as second-generation of drug-eluting stents, currently, the percutaneous treatment of CAD remains limited to cases of low to moderate anatomic complexity. Presently, in Brazil, drug-eluting stents are not available in the public health system, and the public health system does not reimburse the institution when more than two stents are implanted in the same procedure.

In the present study, the SYNTAX score was applied to a non-selected patient population treated with PCI in a tertiary centre within the public health system in the state of São Paulo; its performance as a prognostic tool was evaluated immediately in-hospital and for medium-term evolution.

METHODS

This was a retrospective study performed in a single centre using a database with prospectively-collected data, which evaluated the SYNTAX angiographic score regarding in-hospital and medium-term clinical outcomes of patients undergoing PCI attended to in daily clinical practice.

Patients treated with drug-eluting and bare-metal stents between March and September 2009, either electively or due to acute coronary syndrome, were included. All interventions were performed according to the indications established in the current guidelines[6] following standard techniques, and all patients signed an informed consent before the procedure.

Patients who had all arterial territories treated in a single procedure and those who underwent staged procedures, provided they were performed within 30 days of the index procedure, were included. Patients who underwent previous PCI with stent implantation or CABG surgery were excluded. Patients who were not followed-up in the institution after PCI were also excluded.

Information on the clinical characteristics, procedures and adverse events was obtained from records in the data bank and medical records.

Pre-procedure coronary angiographies of all patients included in this study were analysed, and the SYNTAX score was calculated by two interventional cardiologists using instructions and programs available at the official SYNTAX score website (www.syntaxscore.com). Patients were divided into tertiles according to the SYNTAX score and were evaluated regarding the development of in-hospital and late adverse events.

Major adverse cardiac events (MACE – outcomes such as cardiac death, non-fatal acute myocardial infarction, and new revascularisation of the target-vessel by clinical indication) in late follow-up were considered the primary outcome. All deaths were considered to be from cardiac cause unless another cause had been established. Confirmation of acute myocardial infarction was achieved by evidence of elevated serum markers of myocardial necrosis (> three times the upper limit for creatine kinase-MB fraction) associated with symptoms or electrocardiographic evidence of myocardial ischemia. Q-wave infarctions were defined by new pathologic Q waves on electrocardiogram (two or more contiguous derivations) or new left bundle branch block in addition to the biomarker changes. Revascularisation of the target-vessel was defined as new revascularisation of the treated coronary artery. Chronic renal disease was defined as the presence of a creatinine clearance < 60 mL/min before the procedure.

Secondary outcomes included the success of the procedure, isolated death rates, non-fatal myocardial infarction, and revascularisation of the target-vessel, in addition to definitive or probable stent thrombosis (according to the definition of the Academic Research Consortium – ARC).[7]

Categorical variables were expressed as absolute frequencies and percentages, and continuous variables were expressed as the mean and standard deviation. Data were compared according to the tertiles of the SYNTAX score and by using the chi-squared test or Fisher's exact test for categorical variables, or ANOVA for continuous variables. P-values < 0.05 were considered statistically significant. The capacity of the SYNTAX score to discriminate patients with MACE was evaluated by the receiver operating characteristic (ROC) curve. The SAS and XLSTAT 2011 statistical programs were used.

RESULTS

In the period evaluated, 234 patients undergoing PCI fulfilled inclusion criteria. The mean age of the population was 59.8 ± 9.7 years, and 71.4% of the patients were males. Two hundred ninety-seven vessels were treated with the implantation of 339 stents (mean of 1.44 ± 0.32 stents per patient and 1.14 ± 0.11 stents