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Original article

A case-vignette based assessment of patient's perspective on coronary revascularization strategies, the OPINION study

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ABSTRACT

Background and aims: Significant left main (LM) stem disease is potentially life-threatening and mandates revascularization. This study aimed to assess how patients rate the importance of particular features of coronary artery bypass grafting (CABG) and percutaneous coronary intervention (PCI), how this determines their preference for a particular treatment strategy, and whether particular personality characteristics influence this preference.

Methods and results: In total, 1145 patients who visited the outpatient clinic of the Erasmus Medical Center for stable coronary artery disease were asked to complete a case vignette-questionnaire on a hypothetical significant LM stenosis amenable to PCI or CABG. To assess the individual's personality disposition and general distress level, each patient had to complete a set of 3 standardized, validated questionnaires with satisfactory psychometric properties. Overall 89% of patients preferred PCI to CABG. PCI was the preferred strategy despite a higher risk for repeat revascularization and need for more medication. Remarkably, the fact that a risk for repeat revascularization is more common in the PCI group is less important for the patients who opt for PCI. Risk for stroke and bleeding were the most important arguments to opt for PCI over CABG. Type D personality, depression, and anxiety were all associated with a relatively higher preference for CABG as revascularization strategy.

Conclusion: Overall, when given the choice patients seem to have a clear preference for PCI over CABG and consider stroke and bleeding important procedure-related complications. Patients with Type D personality, depression, or anxiety favor CABG.

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Introduction

Significant left main (LM) stem disease is potentially life-threatening and mandates revascularization [1,2]. Whenever feasible, coronary artery bypass grafting (CABG) is considered the standard of care and is granted a class IA recommendation in the 2014 Task Force on Myocardial Revascularization of the

European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS) guidelines for myocardial revascularization [1]. However, percutaneous coronary intervention (PCI) has emerged as a reasonable alternative with landmark device iterations from balloon angioplasty in the 1980s to bare metal stents in the 1990s and drug-eluting stents more recently [3–6]. Moreover, the revolution in adjunctive pharmacological therapies has reduced the incidence of major adverse cardiac and cerebro-vascular events both periprocedural and at longer-term follow up.

The “Synergy between PCI with Taxus and Cardiac Surgery” trial (SYNTAX) has provided the most compelling data to date comparing PCI vs. CABG in coronary artery disease (CAD) in

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general and LM disease in particular [2,7,8]. The recently published “Everolimus-Eluting Stents or Bypass Surgery for Left Main Coronary Artery Disease” (EXCEL) and “Percutaneous coronary angioplasty versus coronary artery bypass grafting in treatment of unprotected left main stenosis” (NOBLE) trials further refined the position of PCI vs. CABG in patients with LM disease [9,10]. As lesion complexity increases, CABG remains the treatment of first choice leaving a window of opportunity for PCI in LM disease with or without multivessel CAD in lower risk subgroups identified by a SYNTAX score <33. According to the ESC/EACTS, the optimal treatment strategy for each individual patient with LM and multivessel CAD should be determined by consensus of the heart team, containing a core minimum of one cardio-thoracic surgeon and one interventional cardiologist [1]. Patients should be informed about the consequences of each treatment strategy.

Neither the importance of the treatment-related consequences, as rated from the *patient's perspective*, nor the patient's preference for CABG or PCI is formally considered in the equation. Until now, to our knowledge, no data exist on the influence of a patient's psychological profile to their treatment preference. To fill in this gap in knowledge, the aim of our study was to assess: (1) how patients rate the importance of particular features of CABG and PCI; (2) how this determines their preference for a particular treatment strategy; and (3) whether particular personality characteristics (Type D, anxiety, depression) influence this preference.

Methods

Patient sample

All patients who visited the outpatient clinic of the Erasmus Medical Center for stable CAD from June 2010 to August 2011 were eligible for this study. Exclusion criteria were: (1) age <18 years; (2) inability to read/write Dutch; and (3) patients who were considered for revascularization at the time of the study to avoid potential anxiety for an upcoming procedure. Eligible patients received a patient information letter and were asked to return the signed informed consent form. The study was conducted after formal institutional review board approval and in accordance with the Declaration of Helsinki and the Medical Research Involving Human Subjects Act.

Case vignette

Participating patients were asked to complete a case vignette-questionnaire on a hypothetical significant LM stenosis amenable to PCI or CABG. A total of 1145 patients were identified in one year and they were asked to participate and complete the case vignette and questionnaires. Of these, 713 responded and 636 patients (55%) consented and returned the completed questionnaires. Using this vignette, patients were asked to rate the importance of treatment strategy-related consequences and relevant potential adverse clinical events on (Table 1) the following 8 items: (1) need for general anesthesia; (2) sternal scar; (3) risk of procedure-related bleeding requiring intervention; (4) risk of stroke; (5) risk of repeat revascularization; (6) recovery and rehabilitation time; (7) duration of procedure-related in-hospital stay; (8) additional medication after the procedure (e.g. dual antiplatelet therapy). The items relate to the pros and cons of both treatment options. Ratings were done on a 5-point psychometric Likert scale from 1 to 5 (1 = totally irrelevant, 2 = not important, 3 = neutral, 4 = important, 5 = paramount relevance for the individual's interpretation). A score >3 suggests an item to be important for the treatment decision. At completion of the vignette each patient was asked for their ultimate preference for either PCI or CABG.

Psychological questionnaires

To assess the individual's personality disposition and general distress level, each patient had to complete a set of 3 standardized, validated questionnaires with satisfactory psychometric properties:

- (1) The Type D Scale (DS14) to measure Type D personality – a dual personality construct defined by the tendency to experience negative affectivity and the tendency to inhibit these negative feelings in social situations [11]; (score ≥ 10 used as cut-off indicative for Type D).
- (2) The Patient Health Questionnaire (PHQ-9), a self-report depression module (PHQ-9 score: 0–5 = mild, 6–9 = moderate, 10–15 = moderately severe, and >15 = severe depression) [12].
- (3) The Generalized Anxiety Disorder Scale (GAD-7), a 7-item instrument to assess the extent of anxiety during the course of the previous 2 weeks [13].

Statistical analysis

Continuous variables are presented as mean \pm standard deviation. All continuous variables were normally distributed. Categorical variables are expressed as counts and percentages. Group differences in terms of respective preferences for PCI and CABG were examined using the Chi-square test for categorical variables and Student's *t*-test for continuous variables. Multivariable logistic regression models were used to adjust for Type D depression and anxiety and the following baseline characteristics: demographic characteristics (age and gender) and clinical characteristics.

Results

The majority of participants were male with a mean age of 66.7 years (Table 2). A history of prior coronary revascularization was common. Two thirds had prior PCI only, 7% prior CABG only, and 10% prior PCI and CABG. A quarter of all patients demonstrated Type D personality, 18% had depression according to the PHQ-9 and 16% had anxiety.

Overall 89% of patients preferred PCI over CABG in reply to the case vignette-questionnaire. Of the 17% of patients with prior CABG (with or without PCI) one-third preferred CABG and two-thirds would choose PCI. In contrast, of the patients with prior PCI 94% would select PCI over CABG. Table 2 depicts baseline characteristics of patients stratified for revascularization preference. Patients who opted for CABG had more often a history of heart failure, peripheral arterial disease, oncological issues, and prior CABG.

Patient perspective on procedural items

Overall, stroke had the highest score on the Likert scale (mean = 4.0). Stroke was thus considered the most important feature to lead a patient's preference for a particular revascularization strategy. Also the risk of bleeding complications and the risk for future repeat revascularization were considered important features (mean scores: 3.50 and 3.60, respectively). The need for general anesthesia was considered less important (mean 3.29). Duration of recovery and in-hospital stay and the need for additional medication overall obtained scores below 3 on the Likert scale illustrating a neutral impact on the patient's perspective. The persistence of a sternal scar was considered of no importance (mean score 2.08) (Table 1). In comparison with patients who preferred CABG, patients who chose PCI gave higher ratings (indicating more importance) to the risk for stroke (4.09 vs. 3.30, $p < 0.001$) and bleeding (3.56 vs. 3.01, $p < 0.001$). In contrast,

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