Is a Heart Team enough? The role of an interdisciplinary preoperative patient health check in the final qualification for elective cardiac surgery: Pre-Surgery Check Team study

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DOI: 10.33963/KP.a2023.0146

Received:
April 25, 2023

Accepted:
June 26, 2023

Early publication date:
July 2, 2023

INTRODUCTION

Patients with severe symptomatic cardiac disease are often candidates for open-chest cardiac surgery [1, 2]. Due to demographic aging and increasing number of comorbidities, cardiac surgery may be associated with high morbidity, mortality, and prolonged postoperative hospital stay [3–4]. The loss of functional capacity observed during the waiting period has an additional negative impact on postoperative complications and health-related quality of life after surgery [5]. Prehabilitation aims to prepare patients for cardiac surgery by increasing their functional capacity and physiological reserve [6]. Moreover, the proposed Pre Surgery Check Team (PreScheck Team) involving a cardiothoracic surgeon, a cardiologist, an anesthesiologist, a physiotherapist, a psychologist, and often a pulmonologist, may be a very useful step in proper qualification for cardiac surgery.

This study aimed to assess the impact of PreScheck Team's multidisciplinary preoperative assessment on the final decision about qualification for all elective cardiac surgery procedures.

METHODS

This is a single-center prospective observational study conducted in the Department of Cardiovascular Surgery and Transplantology, John Paul II Hospital in Kraków, Poland, from October 1, 2022 to March 31, 2023. The inclusion criteria were (1) qualification for elective cardiac surgery by a local Heart Team; (2) age above 18 years. The exclusion criteria were (1) qualification for emergent/urgent cardiac surgery; and (2) time to surgery less than a month. Participants were subsequently reassessed in person at the already functioning prehabilitation center and examined extensively during their 2-hour clinical appointments 1–3 months before their planned cardiac surgery. Supplementary material, *Figure S1* shows the operation scheme of the local prehabilitation center with the proposed PreScheck Team examination. The baseline medical assessments involved demographic data, BMI, full medical history, results of diagnostic tests, Clinical Frailty Scale (CFS) score, and Nutritional Risk Score (NRS 2002).

Statistical analysis

Statistics were done using STATISTICA v 13.3 software. Categorical variables were expressed as numbers (%) and if the assumption for the χ^2 test was not fulfilled, Fisher's exact test was applied. A *P*-value less than 0.05 was considered significant. Continuous variables were expressed as means (and standard deviation) when normally distributed and compared using Student's t-test. The Kolmogorov-Smirnov test was used to test normality.

RESULTS AND DISCUSSION

All 451 consecutive patients (322 male), aged 29–86, mean 66.28 (9.4) years, were examined at our prehabilitation center in 6 months from

Table 1. Demographic and clinical characteristics of the study population

Characteristics	Measure
Age >65 years, n (%)	276 (61.2)
CFS score ≥5, n (%)	52 (1.53)
BMI, kg/cm^2, mean (SD)	28.47 (4.56)
≥35, n (%)	41 (9.09)
≥30, n (%)	81 (17.86)
LVEF, %	
Mean (SD)	54 (10.4)
≤35, n (%)	45 (7.76)
Arterial hypertension, n (%)	286 (63.41)
COPD/asthma, n (%)	66 (14.63)
Spirometry result, n (%)	29 (6.43)
Diabetes and IGT, n (%)	193 (42.79)
HbA1c result, n (%)	56 (12.42)
CKD ≥ stage 3a, n (%)	46 (10.2)
Anemia, n (%)	49 (10.86)
Paroxysmal/chronic AF, n (%)	92 (20.4)
Atherosclerosis od carotic arteries/PAD, n (%)	39 (8.87)
Previous stroke, n (%)	32 (7.1)
Active smoking, n (%)	49 (10.86)
Planned cardiac surgery procedure, n (%)	
CABG	202 (44.8)
AVR	182 (40.35)
Bental de Bono procedure	35 (7.76)
MVR/MV plasty	76 (16.85)
TV plasty	21 (4.66)
Combined surgery	84 (18.63)
Other	38 (8.43)

Abbreviations: AF, atrial fibrillation; AVR, aortic valve replacement; BMI, body mass index; CABG, coronary artery bypass grafting; CKD, chronic kidney disease; CSF, Clinical Frailty Score; COPD, chronic obstructive pulmonary disease; IGT, impaired glucose tolerance; LVEF, left ventricular ejection fraction; MVR, mitral valve replacement; PAD, peripheral arteries diseases; TV, tricuspid valve

October 2022 and enrolled in the PreScheck analysis. Demographic and clinical data are summarized in Table 1. Additional PreScheck tests were ordered in patients with missing results: chest X-ray (62.53%), spirometry (22.39%), carotid ultrasound (4.66%), and polysomnography (7.32%). The following specialist consultations were needed to finalize the clinical assessment: pulmonary (19.96%), dental (10.42%), diabetic (9.53%), and endocrinological (3.33%).

Comprehensive PreScheck Team interdisciplinary assessment resulted in additional requalification in 84 (18.63%) patients. All 84 patients were reassessed by a Heart Team, regardless of the reason for disqualification. Of these 84 already qualified by a Heart Team for cardiac surgery, 34 patients (40.48%) were disqualified from any intervention and assigned to the optimal medical therapy group, 28 (33.33%) to the transcatheter aortic valve implantation (TAVI) group, 22 (26.19%) to the percutaneous coronary intervention (PCI) group, 4 (4.76%) to the transcatheter mitral valve repair (TMVR) group. In 4 patients (4.76%), combined PCI and TAVI was recommended. A decision about permanent disqualification of a patient from any procedure was always taken jointly by the PreScheck Team and the Heart Team.

The main reason for permanent disqualification from cardiac surgery was an extremely high individual operational risk in 58 patients (69.05%) associated predominantly with advanced age, high CFS score, pulmonary status, and morbid obesity. Technical surgical aspects (chest malformation, no venous or arterial material for CABG) were the reason for disqualification in 4 patients (9.52%). After in-depth discussions with these patients and family members about very high surgical risk and questionable benefits, 18 patients (21.43%) decided to withdraw consent for surgery.

After PreScheck Team assessment, two groups of patients were formed from the population of patients initially qualified by Heart Teams: patients finally listed for cardiac surgery (367 patients) and disqualified from surgery (84 patients). Statistical analysis was performed and revealed no significant differences in relation to BMI, left ventricular ejection fraction (LVEF) and comorbidities between the two groups. In the group disqualified from cardiac surgery, there was a tendency toward older age (73.48 vs. 64.63 years) and higher CSF score (CFS ≥ 5 in 44.05% vs. 4.09%). The comparison between the groups was summarized in Supplementary material, *Table S1*.

Enhanced Recovery After Surgery (ERAS) is a multidisciplinary care initiative to promote recovery after surgery throughout the entire perioperative period [7]. The standard of Enhanced Recovery After Cardiac Surgery (ERACS) has been suggested to change the traditional mode of care [8]. Prehabilitation was until now defined as a process of improving patient functional status before surgery [9], but it may be also an integral component of the preoperative strategy [8]. This multimodal concept is usually based on three fundaments: improvement of physical condition, nutritional optimization, and cognitive intervention [9]. Prehabilitation has the potential to improve surgical outcomes in patients undergoing cardiothoracic surgery [10, 11]. There have been few trials investigating the impact of prehabilitation in cardiac surgery patients. Most trials focused on preoperative inspiratory muscle training in patients undergoing elective surgery and found a reduction in postoperative pulmonary complications and reduced length of stay [5, 10, 11].

The PreScheck Team program implemented in our prehabilitation center is dedicated to all patients qualified for elective cardiac surgery and consists of 3 components: (1) detailed interdisciplinary medical assessment; (2) physical assessment and rehabilitation training; (3) deep psychological assessment.

Decision-making in both valvular disease and chronic coronary syndromes involves accurate diagnosis, timing of intervention, risk assessment, and selection of the most suitable type of intervention. The current European Society of Cardiology (ESC) guidelines emphasize the importance of the multidisciplinary Heart Team as a key component of contemporary patient care [1, 2]. In our hospital, the Heart

Team consults around 5000 cases a year, e.g. 4750 consultations were performed in 2022, and 2875 patients were qualified for cardiac surgery. Since 2021, all patient referrals have been submitted electronically, which greatly facilitates the work of cooperating centers. This allows the Heart Team to view online all imaging tests, but unfortunately, gives only very limited access to clinical data and no option to talk to the patient.

The population of patients with cardiovascular disease listed for cardiac surgery has a high prevalence of advanced age, frailty, low cardiac fitness, and severe extracardiac comorbidities that can cause a decline in physiological reserve [3, 4]. Analysis of our data strongly confirms these findings and shows a high percentage of patients above 65 years, CFS ≥5, with arterial hypertension, diabetes, and chronic pulmonary disease. Numerous perioperative algorithms have inadequate diagnostic accuracy, tend to overestimate the baseline risk, and are not commonly used worldwide. EuroSCORE II [12] and the Society of Thoracic Surgeons (STS) score calculator [13] are being still updated to reflect the latest adult cardiac surgery risk models. The only universal algorithm is still the American Society of Anesthesiologists (ASA) Physical Status Classification System [14].

The PreScheck Team concept implemented in our center is actually a hybrid of short-term outpatients preoperative and prehabilitation programs. It allows thorough multidisciplinary assessment by different health specalists. PreScheck Team requalification resulted in an unexpectedly high rate of final disqualification from open-chest cardiac surgery — 18.63% of all patients, who met all qualification requirements in Heart Team's assessment, were finally disqualified from surgery.

E-Heart Team is a great achievement, but the qualification process cannot rely only on the results of diagnostic tests and limited clinical data. The PreScheck Team gives us the possibility to identify all patients that are not going to benefit from surgery and those with potential postoperative problems and to refer those patients for additional tests. The PreScheck Team interdisciplinary approach that we are proposing should be a complementary stage in the qualification process for elective cardiac surgery. This two-step mode of decision-making allows for proper individual risk assessment and selection of type of intervention.

Supplementary material

Supplementary material is available at https://journals.viamedica.pl/kardiologia_polska.

Article information

Conflict of interest: None declared.

Funding: None.

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