Demographics and Outcomes of Percutaneous Coronary Intervention in Thailand: Data from Thai Percutaneous Coronary Intervention Registry

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Background: *Percutaneous coronary intervention (PCI) has been and continues to be standard treatment in patients with coronary artery disease. The data for demographic and outcomes in Thailand are limited.*
Objective: *To study data and characteristics relating to patients, the procedure, and outcomes of percutaneous coronary intervention in the Thai population.*
Material and Method: *The Thai Percutaneous Coronary Intervention Registry (TPCIR) was established in 2006, consisting of 27 hospitals in Thailand that perform the PCI procedure. All patients who underwent PCI between May 2006 and October 2006 in participating hospitals were asked to participate in this registry. Data was recorded in case record form and then entered into the web-based registry. Key variables include demographic data, risk factors, indications for PCI, outcomes, and complications.*
Results: *Four thousand one hundred fifty six patients were enrolled; 69.2% were male. Average age of PCI patients was 62.7 years. Indications for PCI were ST segment elevation myocardial infarction (14%), Non-ST segment elevation acute coronary syndrome (37.3%), and stable coronary artery disease (48.7%). PCI was successfully performed in 92.5% of lesions or 89.6% of cases with in-hospital complications reported in 12% of cases.*
Conclusion: *This was the first nationwide multi-center study of PCI in Thailand. The overall PCI procedure success rate was 92.5%.*

Keywords: *Percutaneous coronary intervention, Thailand, Coronary artery disease, Acute coronary syndrome*

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Prevalence of coronary artery disease (CAD) continues to increase in both developing countries and Western countries and prevalence rates are projected to increase further, at least through the year 2030[1]. However, improvements in cardiovascular medications and procedures have caused mortality rates from cardiovascular disease to decrease[2]. In addition to cardiovascular medications, a significant numbers of patients have to be treated with revascularization either by percutaneous coronary intervention (PCI) or by coronary artery bypass graft (CABG) surgery[3]. PCI may be performed in high risk acute coronary syndrome (ACS) patients or in those with stable CAD who are highly symptomatic or are considered high risk based on non-invasive investigations, such as exercise stress test or stress imaging[4].

PCI should be performed by an experienced operator in a well-organized and fully equipped medical center[5]. Quality control procedures should be established and regular quality checks of the cardiac catheterization unit must be conducted to ensure that PCI procedures are appropriately performed and that complication rates are within acceptable range[6]. Over the years, rapidly technological advancement together

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with well-designed clinical trials have evolved PCI from plain old balloon angioplasty (POBA) to the era of bare metal stent (BMS) and drug eluting stent (DES) [7]. Multicenter PCI registries have been established in both Western population[6,8] and Asian patient populations[9,10]. PCI registries are beneficial for sharing PCI data between centers in the same region and between regions. PCI registry data reflects real world practice and outcomes. This data can facilitate improvement in the quality of care that PCI patients receive and can help in the development of future PCI-related protocol[11].

The objectives of this study were to describe baseline patient characteristics from the Thai PCI registry and to report outcomes and complications of patients who underwent PCI.

Material and Method

Study population

Thai PCI registry was conducted in 4,156 patients who underwent PCI between May 2006 and October 2006 in any one of the 27 Thai Percutaneous Coronary Intervention Registry (TPCIR) member hospitals in Thailand. Patients were excluded if they did not want to participate in the study. Patient data was entered onto a case record form (CRF) by nurses or trained personnel and was verified by the principle investigator(s) of each participating site. Data from CRFs was entered into the web-based system in the double-entry fashion. CRFs were mailed to central data management twice per month where research coordinators reviewed CRF data and made query back to study site when they had questions. This study was approved by the Institutional Review Board of each of the 27 participating hospitals. Informed consent was obtained from all subjects prior to participation.

Definitions

Myocardial infarction was defined as clinical symptoms and positive cardiac markers (troponin-T or troponin-I above upper normal limit or creatine kinase MB (CK-MB) more than two times upper normal limit).

ST segment elevation myocardial infarction (STEMI) was defined as myocardial infarction plus ST segment elevation of at least 2 mm in two consecutive leads or new left bundle branch block (LBBB) or new development of pathological Q wave in at least two consecutive leads.

Successful PCI was defined as normal coronary flow or Thrombolysis in Myocardial Infarction (TIMI) grade 3 flow with residual stenosis of no more than 50%.

In-hospital adverse events were stroke (new neurological deficit after PCI lasted more than 24 hours), total death, cardiovascular death (sudden death or death related to pump failure), myocardial infarction, urgent CABG, unplanned PCI, bleeding complication, entry site complication, life threatening ventricular arrhythmia, cardiac tamponade, cardiogenic shock, renal failure, heart failure.

Data collection

The following data are collected in each PCI patient:

1) Demographic data
2) Cardiovascular risk factors
3) Indications for PCI
4) Finding from coronary angiography (CAG)
5) Details of PCI procedures and type of stents
6) Outcome of PCI
7) In-hospital adverse events were stroke (new neurological deficit after PCI lasted more than 24 hours), total death, cardiovascular death (sudden death or death related to pump failure), myocardial infarction, urgent CABG, unplanned PCI, bleeding complication, entry site complication, life threatening ventricular arrhythmia, cardiac tamponade, cardiogenic shock, renal failure, heart failure.

Statistical analysis

Continuous data were expressed as mean and standard deviation and categorical data were expressed as count and percentages. All analyses were performed using SPSS Statistics version 20 (SPSS, Inc., Chicago, IL, USA).

Results

Four thousand one hundred fifty six patients were enrolled and 2,877 (69.2%) were male. Average age of PCI patients was 62.7 years. Public and private breakdown of participating hospitals was 80% and 20% respectively. Patients' demographic and baseline characteristics are shown in Table 1. Gender and age distribution of participants are shown in Fig. 1. Indications for PCI were STEMI in 581 patients (14%), non-ST segment elevation acute coronary syndrome (NSTEACS) in 1,551 (37.3%), and stable CAD in 2024 (48.7%) (Fig. 2). Eighty percent of patients had angina. Non-invasive testing was performed prior to PCI in 41.6% of patients with stable CAD. Results of CAG showed distribution of patients with one-vessel,

Table 1. Demographic and baseline characteristics

Variables	Clinical presentation			
	STEMI (n = 581)	NSTEACS (n = 1,551)	Stable CAD (n = 2,024)	Total (n = 4,156)
Male gender	437 (75.2)	1,016 (65.5)	1,424 (70.4)	2,877 (69.2)
Mean age (years)	60.9±12.7	63.8±11.2	62.5±10.8	62.7±11.3
Payment for PCI				
Self-pay	155 (26.7)	329 (21.2)	421 (20.8)	905 (21.8)
Civil service	200 (34.4)	701 (45.2)	1,026 (50.7)	1,927 (46.4)
Company paid	9 (1.5)	8 (0.5)	20 (1.0)	37 (0.9)
Social security	29 (5.0)	62 (4.0)	82 (4.1)	173 (4.2)
Universal	161 (27.7)	400 (25.8)	422 (20.8)	983 (23.7)
Private insurance	27 (4.6)	51 (3.3)	53 (2.6)	131 (3.2)
Hospital type				
Government	409 (70.4)	1,246 (80.3)	1,662 (82.1)	3,317 (79.8)
Private hospital	172 (29.6)	305 (19.7)	362 (17.9)	839 (20.2)
BMI (kg/m^2)	24.5 (3.9)	24.8 (3.9)	25.3 (3.9)	25.0 (3.9)
Normal (18.5 to 22.99)	189 (32.5)	444 (28.6)	482 (23.8)	1,115 (26.8)
Underweight (<18.5)	18 (3.1)	59 (3.8)	66 (3.3)	143 (3.4)
Overweight (23.0 to 24.99)	138 (23.8)	357 (23.0)	445 (22.0)	940 (22.6)
Obese (≥25)	236 (40.6)	691 (44.6)	1,031 (50.9)	1,958 (47.1)
Previous MI (>7 days)	62 (10.7)	543 (35.0)	603 (29.8)	1,208 (29.1)
Previous PCI	39 (6.7)	311 (20.1)	678 (33.5)	1,028 (24.7)
Previous CABG	5 (0.9)	79 (5.1)	77 (3.8)	161 (3.9)
Previous CVA/TIA	30 (5.2)	82 (5.3)	108 (5.3)	220 (5.3)
Chronic renal failure	35 (6.0)	132 (8.5)	109 (5.4)	276 (6.6)
Dialysis	10 (1.7)	63 (4.1)	53 (2.6)	126 (3.0)
Peripheral arterial disease	7 (1.2)	50 (3.2)	76 (3.8)	133 (3.2)
Family history of CAD	65 (11.2)	128 (8.3)	243 (12.0)	436 (10.5)
Hypertension	296 (50.9)	1,092 (70.4)	1,482 (73.2)	2,870 (69.1)
Dyslipidemia	299 (51.5)	1,214 (78.3)	1,590 (78.6)	3,103 (74.7)
History of smoking	304 (52.3)	604 (38.9)	815 (40.3)	1,723 (41.5)
Smoking status				
Current	189 (32.5)	207 (13.3)	187 (9.2)	583 (14.0)
Previous	115 (19.8)	397 (25.6)	628 (31.0)	1,140 (27.4)
Diabetes mellitus	187 (32.2)	591 (38.1)	780 (38.5)	1,558 (37.5)

STEMI = ST segment elevation myocardial infarction; NSTEACS = non-ST segment elevation acute coronary syndrome; CAD = coronary artery disease; BMI = body mass index; MI = myocardial infarction; PCI = percutaneous coronary intervention; CABG = coronary artery bypass graft; CVA = cerebrovascular accident; TIA = transient ischemic attack
Data are presented as mean ± SD or number (%)

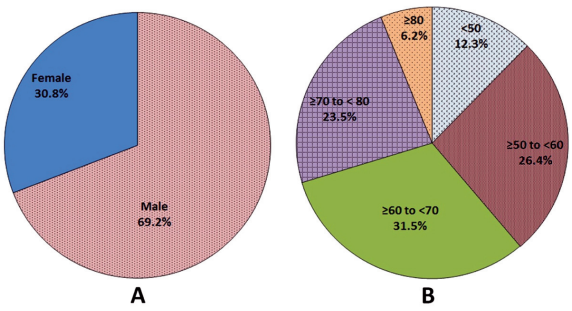

Fig. 1 (A) Subject gender, (B) subject age distribution.

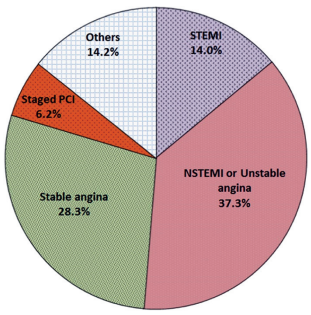

Fig. 2 Indications for PCI.

Table 2. Clinical information from patients with STEMI, NSTEACS, and stable CAD

Variables	Clinical presentation			
	STEMI (n = 581)	NSTEACS (n = 1,551)	Stable CAD (n = 2,024)	Total (n = 4,156)
Angina	544 (93.6)	1,451 (93.6)	1,329 (65.7)	3,324 (80.0)
CCS class of angina (among patients with history of angina)				
Class I	11 (2.0)	65 (4.5)	168 (12.6)	244 (7.3)
Class II	29 (5.3)	349 (24.1)	819 (61.6)	1,197 (36.0)
Class III	98 (18.0)	621 (42.8)	274 (20.6)	993 (29.9)
Class IV	406 (74.6)	416 (28.7)	68 (5.1)	890 (26.8)
Non-invasive test	32 (5.5)	320 (20.6)	841 (41.6)	1,193 (28.7)
Test result (among patients with non-invasive test)				
Positive	22 (68.8)	278 (86.9)	750 (37.1)	1,050 (88.0)
Negative	8 (25.0)	13 (4.1)	34 (1.7)	55 (4.6)
Equivocal	1 (3.1)	23 (7.2)	51 (2.5)	75 (6.3)
Unknown	1 (3.1)	6 (1.9)	6 (0.3)	13 (1.1)
Heart failure within 2 weeks	112 (19.3)	278 (17.9)	166 (8.2)	556 (13.4)
NYHA class (among patients with heart failure)				
Class I	9 (8.0)	3 (1.1)	14 (8.4)	26 (4.7)
Class II	17 (15.0)	91 (32.7)	55 (33.1)	163 (29.3)
Class III	18 (15.9)	99 (35.6)	50 (30.1)	167 (30.0)
Class IV	69 (61.1)	85 (30.6)	47 (28.3)	201 (36.1)
Cardiogenic shock	174 (29.9)	53 (3.4)	30 (1.5)	257 (6.2)
Extent of coronary disease				
1-vessel	234 (40.3)	558 (36.0)	652 (32.2)	1,444 (34.7)
2-vessel	188 (32.4)	522 (33.7)	689 (34.0)	1,399 (33.7)
3-vessel	155 (26.7)	467 (30.1)	679 (33.5)	1,301 (31.3)
Only left main stenosis	4 (0.7)	4 (0.3)	4 (0.2)	12 (0.3)
Left main stenosis >50%	31 (5.3)	74 (4.8)	82 (4.1)	187 (4.5)
LVEF (%)	48.3±13.2	55.0±15.6	58.0±15.0	55.8±15.3

STEMI = ST segment elevation myocardial infarction; NSTEACS = non-ST segment elevation acute coronary syndrome; CAD = coronary artery disease; CCS = Canadian Cardiovascular Society; NYHA = New York Heart Association; LVEF = left ventricular ejection fraction

Data are presented as mean ± SD or number (%)

two-vessel, and three-vessel disease to be almost equal (35%, 34%, and 31% respectively) (Table 2).

In patients with STEMI, PCI was performed as the primary treatment in 61% of cases. Electrocardiogram (ECG) showed ST segment elevation in anterior wall in 45% and inferior wall in 46%. Thrombolytic treatment was given prior to PCI in 21%. Streptokinase was the thrombolytic agent given in the vast majority of cases (94%) (Table 3). Most patients were given dual antiplatelets prior to PCI. Glycoprotein 2B3A inhibitors were used in 14.3% of patients during the PCI procedure (Table 4).

PCI procedure characteristics are shown in Table 5. A majority of cases were performed under elective condition with femoral artery most often used as the access site. The procedure was performed with single lesion in 65% of patients (Table 5, Fig. 3).

PCI was performed in 6,122 lesions. PCI for stent placement was performed in 5,174 lesions (84.5%); 3,246 of which (62.7%) was DES. PCI procedure was successfully performed in 5661 lesions (92.5%) of cases. At patient level, PCI was successful in 3,724 out of 4,156 cases (89.6%) if the meaning is successful procedure in all lesions with in-hospital complications reported in 12%. Details relating to complications are shown in Table 6. Post procedural myocardial infarction was reported in 4%.

Discussion

This nationwide multicenter study was conducted over a six-month period in Thailand. PCI was performed in 4,156 cases at the 27 TPCIR hospitals in Thailand. Patients with stable CAD was found in 48.7% of cases followed by NSTEACS and STEMI.

The procedural success rate was 92.5% with in-hospital complications occurring in 12% of patients including cardiac death (2.1%), myocardial infarction (4.1%), stroke (0.3%), urgent CABG (0.8%), unplanned PCI (0.3%), and stent thrombosis (0.3%).

Table 3. Types of treatment and ECG in of patients with STEMI (n = 581)

Variables	Number (%)
Type of PCI in STEMI	
Primary	353 (60.8)
Facilitated	1 (0.2)
Rescue	39 (6.7)
Other	188 (32.4)
Transferred to PCI center	327 (56.3)
EKG	
Elevation	574 (98.8)
- Anterior	258 (44.9)
- Inferior	264 (46.0)
- Antero-lateral	69 (12.0)
ST depression	28 (4.8)
LBBB	6 (1.0)
Thrombolytic before procedure (minutes)	119.0±20.5
Type of thrombolytic	
Streptokinase	112 (94.1)
t-PA	6 (5.0)
TNK	1 (0.8)

PCI = percutaneous coronary intervention; STEMI = ST segment elevation myocardial infarction; LBBB = left bundle branch block; t-PA = tissue plasminogen activator; TNK = tenecteplase; ECG = electrocardiogram
Data are presented as mean ± SD or number (%)

Demographic data and cardiovascular risk factors are similar between this study and data reported by a PCI registry from the United States[6]. Our study had a greater proportion of patients with stable CAD and a lower number of patients with NSTEACS. Antithrombotics were used less in our patients than in the US registry. Complication rates and number of diseases arteries were similar between the two studies. Rate of successful PCI was higher in the US, as compared to the PCI success rate reported in this study.

The Asia-Pacific Evaluation of Cardiovascular Therapies (ASPECT) collaboration collected PCI data from Hong Kong, Malaysia, Singapore, Melbourne, and Southern Australia[9]. Compared to ASPECT data, our study had a lower proportion of males with a similar age group and cardiovascular risk factors. Our study had a higher proportion of patients with stable CAD, lower procedural success rate and lower use of dual antiplatelet agents.

Data from the TPCIR helps to monitor PCI practices and outcomes in Thailand. The Heart Association of Thailand endorsed this project with the vision that this registry is important to keep the PCI practice up to the current standard and to make sure that all patients received appropriate care.

The number of PCI procedures has continued to increase over the last 20 years[6,8]. There have been many advances stent materials and PCI techniques, including the development of many new antithrombotic drugs[3,7]. After the report of better outcome from fractional flow reserve (FFR) guided PCI, the use of FFR has increased and may affect the number of PCI

Table 4. Antithrombotic medications used prior to, and in catheterization lab (does not include intra coronary medications)

Cardiac medication	Within 24 hours prior to cath lab				In the cath lab			
	STEMI (n = 581)	NSTEACS (n = 1,551)	Stable CAD (n = 2,024)	Total (n = 4,156)	STEMI (n = 581)	NSTEACS (n = 1,551)	Stable CAD (n = 2,024)	Total (n = 4,156)
Aspirin	537 (92.4)	1,412 (91.0)	1,729 (85.4)	3,678 (88.5)	36 (6.2)	178 (11.5)	234 (11.6)	448 (10.8)
Clopidogrel	424 (73.0)	1,076 (69.4)	1,336 (66.0)	2,836 (68.2)	125 (21.5)	470 (30.3)	576 (28.5)	1,171 (28.2)
Ticlopidine	9 (1.5)	119 (7.7)	176 (8.7)	304 (7.3)	2 (0.3)	5 (0.3)	3 (0.1)	10 (0.2)
Abciximab	0 (0.0)	2 (0.1)	0 (0.0)	2 (0.5)	40 (6.9)	43 (2.8)	35 (1.7)	118 (2.8)
Eptifibatide	10 (1.7)	5 (0.3)	2 (0.1)	17 (0.4)	215 (37.0)	148 (9.5)	115 (5.7)	478 (11.5)
Tirofiban	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.1)	1 (0.5)	2 (0.0)
Heparin	42 (7.2)	28 (1.8)	13 (0.6)	83 (2.0)	464 (79.9)	1,257 (81.0)	1,671 (82.6)	3,392 (81.6)
LMWH	134 (23.1)	283 (18.2)	73 (3.6)	490 (11.8)	76 (13.1)	299 (19.3)	519 (25.6)	894 (21.5)
Other	85 (14.6)	145 (9.3)	119 (5.9)	349 (8.4)	120 (20.7)	177 (11.4)	245 (12.1)	542 (13.0)

STEMI = ST segment elevation myocardial infarction; NSTEACS = non-ST segment elevation acute coronary syndrome; CAD = coronary artery disease; LMWH = low molecular weight heparin
Numbers are expressed as number (%)

Table 5. Procedure characteristics

Variables	Clinical presentation			
	STEMI (n = 581)	NSTEACS (n = 1,551)	Stable CAD (n = 2,024)	Total (n = 4,156)
Clinical setting for PCI				
Elective	99 (17.0)	1,232 (79.4)	1,954 (96.5)	3,285 (79.0)
Urgent	70 (12.0)	282 (18.2)	57 (2.8)	409 (9.8)
Emergent	412 (70.9)	37 (2.4)	13 (0.6)	462 (11.1)
Ad hoc PCI (same setting as diagnostic CAG)	560 (96.4)	1,351 (87.1)	1,497 (74.0)	3,408 (82.0)
Access site				
Femoral	548 (94.3)	1,401 (90.3)	1,809 (89.4)	3,758 (90.4)
Brachial	0 (0.0)	2 (0.1)	2 (0.1)	4 (0.1)
Radial	33 (5.7)	146 (9.4)	213 (10.5)	392 (9.4)
Other	0 (0.0)	2 (0.1)	0 (0.0)	2 (0.0)
Number of attempted lesions during procedure				
1	453 (78.0)	975 (62.9)	1,264 (62.5)	2,692 (64.8)
2	108 (18.6)	422 (27.2)	545 (26.9)	1,075 (25.9)
3	14 (2.4)	116 (7.5)	166 (8.2)	296 (7.1)
4	6 (1.0)	30 (1.9)	39 (1.9)	75 (1.8)
5	0 (0.0)	7 (0.5)	9 (0.4)	16 (0.4)
6	0 (0.0)	1 (0.1)	1 (0.0)	2 (0.0)
IABP used	134 (23.1)	53 (3.4)	34 (1.7)	221 (5.3)
Timing of IABP placement				
Pre-procedure	46 (7.9)	27 (1.7)	15 (0.7)	88 (2.1)
During or after	88 (15.1)	27 (1.7)	19 (0.9)	134 (3.2)
Vascular closure device	20 (3.4)	55 (3.5)	69 (3.4)	144 (3.5)

STEMI = ST segment elevation myocardial infarction; NSTEACS = non-ST segment elevation acute coronary syndrome; CAD = coronary artery disease; PCI = percutaneous coronary intervention; CAG = coronary angiogram; IABP = intra-aortic balloon counterpulsation

Data are presented as number (%)

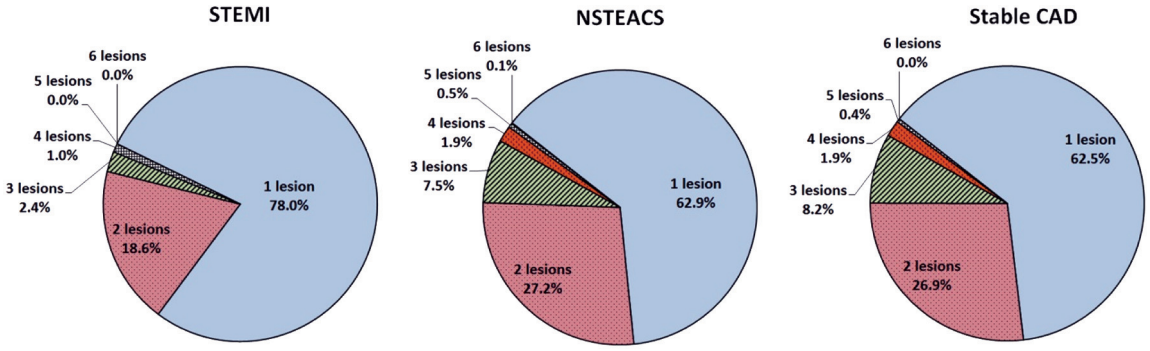

Fig. 3 Number of attempted lesions in STEMI, NSTEACS, and stable CAD.

procedures performed in the future[12]. PCI has been proven to have benefits in symptom relief in patients with stable CAD[13] and showed mortality benefit in patients with high risk ACS[14,15]. In patients with stable CAD, PCI does not have mortality benefit unless the affected vessel supplied a large portion of myocardium[16]. In our registry, the majority of PCI was performed in stable CAD instead of in the setting of ACS, and non-invasive test was rarely performed prior to PCI. This raised the questions whether or not indications to performed PCI should be more carefully examined or audited. Standard guidelines for PCI have been published by the American College of Cardiology[5] and the European Society of Cardiology[3].

Table 6. In-hospital adverse events

Variables	Clinical presentation			
	STEMI (n = 581)	NSTEACS (n = 1,551)	Stable CAD (n = 2,024)	Total (n = 4,156)
Myocardial infarction	0 (0.0)	65 (4.2)	107 (5.3)	172 (4.1)
CABG	12 (2.1)	8 (0.5)	12 (0.6)	32 (0.8)
Entry site complication	24 (4.1)	23 (1.5)	30 (1.5)	77 (1.9)
Non-entry site bleeding complication	28 (4.8)	10 (0.6)	11 (0.5)	49 (1.2)
Bleeding complication requiring transfusion	15 (2.6)	7 (0.5)	7 (0.3)	29 (0.7)
Bleeding site				
GI	21 (3.6)	5 (0.3)	5 (0.2)	31 (0.7)
Abdominal wall	1 (0.2)	1 (0.1)	1 (0.0)	2 (0.0)
Retroperitoneum	1 (0.2)	1 (0.1)	1 (0.0)	3 (0.1)
Other	6 (1.0)	4 (0.3)	4 (0.2)	14 (0.3)
Stroke	5 (0.9)	4 (0.3)	2 (0.1)	11 (0.3)
Ischemic	2 (40.0)	3 (75.0)	1 (50.0)	6 (54.5)
Hemorrhagic	3 (60.0)	1 (25.0)	1 (50.0)	5 (45.5)
In-stent thrombosis	3 (0.5)	5 (0.3)	3 (0.1)	11 (0.3)
Unplanned PCI	8 (1.4)	4 (0.3)	2 (0.1)	14 (0.3)
VT/VF requiring treatment	55 (9.5)	18 (1.2)	15 (0.7)	88 (2.1)
Tamponade	1 (0.2)	4 (0.3)	3 (0.1)	8 (0.2)
Cardiogenic shock	82 (14.1)	29 (1.9)	20 (1.0)	131 (3.2)
Heart failure	60 (10.3)	27 (1.7)	19 (0.9)	106 (2.6)
Renal failure	54 (9.3)	21 (1.4)	13 (0.6)	88 (2.1)
Death	74 (12.7)	33 (2.1)	12 (0.6)	119 (2.9)
Cause of death				
- Cardiac death	60 (10.3)	21 (1.4)	7 (0.3)	88 (2.1)
- Non-cardiac death	14 (2.4)	12 (0.8)	5 (0.2)	31 (0.7)
Death in cath lab	6 (1.0)	0 (0.0)	1 (0.0)	7 (0.2)
Total adverse outcomes	165 (28.4)	164 (10.6)	178 (8.8)	507 (12.2)

STEMI = ST segment elevation myocardial infarction; NSTEACS = non-ST segment elevation acute coronary syndrome; CAD = coronary artery disease; CABG = coronary artery bypass graft; GI = gastrointestinal; PCI = percutaneous coronary intervention
Data are presented as number (%)

Appropriate use of the procedure has been promoted to prevent overuse or misuse of the procedure[4]. However, many experts have expressed concern regarding how to apply these appropriate-use criteria in real-world practice[17]. In an attempt to mitigate this concern, several criteria revisions have been proposed. As a result of these efforts to standardize PCI protocols, the outcomes of PCI are improving and complication rates are decreasing even in the elderly[18].

There are several inherent limitations. First, the data we evaluated in this study was collected many years ago. Publication of this report as delayed, however, due to problems related to cleaning and validating the data. As such, the comparison of data evaluated in this study with more recent or current registry may be difficult. In addition, PCI data from the TPCIR may not accurately represent PCI data of the whole country. Of the 27 hospitals that participated in the registry, a majority are university-based and medium to large hospitals with a significant majority located in Bangkok. Therefore, subsequent registry of PCI in this modern era, involving larger numbers of PCI facilities, with specific objectives to address the problems arises from this first registry, i.e., the indications and appropriateness of the uses of PCI, resource utilization, risk-adjusted success rate, and complication rate, should be carried out.

What is already known on this topic?

PCI is a standard treatment in patients with CAD.

What this study adds?

Rates of success and related complication in PCI reflect the standard of practice, with rates potentially varying from region to region.

TPCIR Group

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Potential conflicts of interest

None.

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ลักษณะของผู้ป่วยและผลลัพธ์ของการทำหัตถการขยายหลอดเลือดหัวใจ: ข้อมูลจากการลงทะเบียนผู้ป่วยที่รับการทำหัตถการขยายหลอดเลือดหัวใจในประเทศไทย

รุ่งโรจน์ กฤตยพงษ์, สรณ บุญใบชัยพฤกษ์, ทรงศักดิ์ เกียรติชูสกุล, ชุมพล เปี่ยมสมบูรณ์, ชุณหเกษม โชตินัยวัตรกุล, ระพีพล กุญชร ณ อยุธยา, สุพจน์ ศรีมหาโชตะ, วศิน พุทธารี, ประวิชช์ ตันประเสริฐ, ดำรัส ตรีสุโกศล, สำหรับคณะวิจัย TPCIR

ภูมิหลัง: *การรักษาหลอดเลือดหัวใจตีบด้วยการใส่สายสวนแล้วขยายด้วยบอลลูน หรือ ขดลวด (percutaneous coronary intervention: PCI) ถือเป็นการรักษามาตรฐานอย่างหนึ่งของผู้ป่วยโรคหลอดเลือดหัวใจตีบ (coronary artery disease)*
วัตถุประสงค์: *เพื่อการศึกษาลักษณะของผู้ป่วยที่ได้รับการทำ PCI และผลของการทำ PCI*
วัสดุและวิธีการ: *การลงทะเบียนของสหสถาบันของ PCI จัดทำขึ้นในโรงพยาบาล 27 แห่ง ในประเทศไทย (Thai PCI Registry หรือ TPCIR) ที่สามารถทำ PCI ได้ใน พ.ศ. 2549 ข้อมูลถูกบันทึกลง แบบบันทึกข้อมูลแล้วบันทึกในระบบฐานข้อมูลอีกครั้งหนึ่ง ข้อมูลที่บันทึก ได้แก่ ข้อมูลพื้นฐานของผู้ป่วย ปัจจัยเสี่ยงของโรคหลอดเลือดหัวใจตีบ ข้อบ่งชี้ในการทำ PCI รายละเอียดของโรคและหัตถการผลของการทำ PCI และการเกิดภาวะแทรกซ้อน*
ผลการศึกษา: *มีผู้ป่วยทั้งสิ้น 4,156 ราย 69.2% เป็นชาย อายุเฉลี่ย 62.7 ปี ขอบ่งชี้ในการทำ PCI เป็นกล้ามเนื้อหัวใจขาดเลือดฉับพลันชนิด ST segment ยกขึ้น 14% ชนิด ST segment ไม่ยกขึ้น 37.3% และเป็นหลอดเลือดหัวใจตีบที่มีอาการคงที่ 48.7% PCI ทำสำเร็จ 92.5% มีภาวะแทรกซ้อนเกิดขึ้นโรงพยาบาล 12%*
สรุป: *การศึกษานี้เป็นการศึกษาแรกที่รวบรวมผู้ป่วยที่ได้รับการทำ PCI การทำหัตถการประสบความสำเร็จ 92.5%*