Interventional cardiology procedures in Poland in 2018. Summary report of the Association of Cardiovascular Interventions of the Polish Cardiac Society (AISN PTK) and Jagiellonian University Medical College

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The ORPKI (*Ogólnopolski Rejestr Procedur Kardiologii Inwazyjnej*) electronic data capture is continuously modified to address the changing landscape of interventional cardiology procedures in Poland, especially the growing number of structural heart disease interventions and changes in practice recommendations such as multivessel percutaneous coronary intervention (PCI) in ST-segment elevation myocardial intervention (STEMI). It is endorsed by Association of Cardiovascular Interventions of the Polish Cardiac Society (*Asocjacja Interwencji Sercowo-Naczyniowych Polskiego Towarzystwa Kardiologicznego* – AISN PTK) and operated by the Jagiellonian University Medical College and includes 163 interventional cardiology centers in Poland (total number the same as in 2017), of which 95 are formally accredited by AISN PTK. Currently there are 613 certified PCI operators in Poland. AISN PTK conducts the PCI and transcatheter aortic valve implantation (TAVI) operators' certification process based on the previously published eligibility criteria. The ORPKI database not only allows the nationwide monitoring of the procedural trends but also documents individual operators' procedural volumes.

According to current analysis of the ORPKI database in comparison to 2017, there was a decrease in the total number of coronary angiographies (CAG) [1]. There were 182 226 CAG (4733 per 1 million inhabitants per year) in 2018, which corresponds to a decrease of 8.1% compared to 2017 (Figure 1). This trend has been observed since 2015, and current numbers correspond to those of the year 2010. In terms of procedural features in 2018 we observed a 2% increase in the use of the radial approach for coronary angiography (86%), also with high, similar to 2017, prevalence among STEMI patients (75%). This trend is reassuring because it adheres to the current recommendations of European Society of Cardiology (ESC) Guidelines and improves patient outcomes. Complications of coronary angiography in 2018 are presented in Table I.

The total number of PCI procedures was 104 283 and was lower by 8.7% (2709 PCIs per 1 million inhabitants per year) than reported to the ORPKI database in 2017 (Figure 1). The majority of the procedures were indicated by the acute coronary syndromes (ACS): 35% acute myo-

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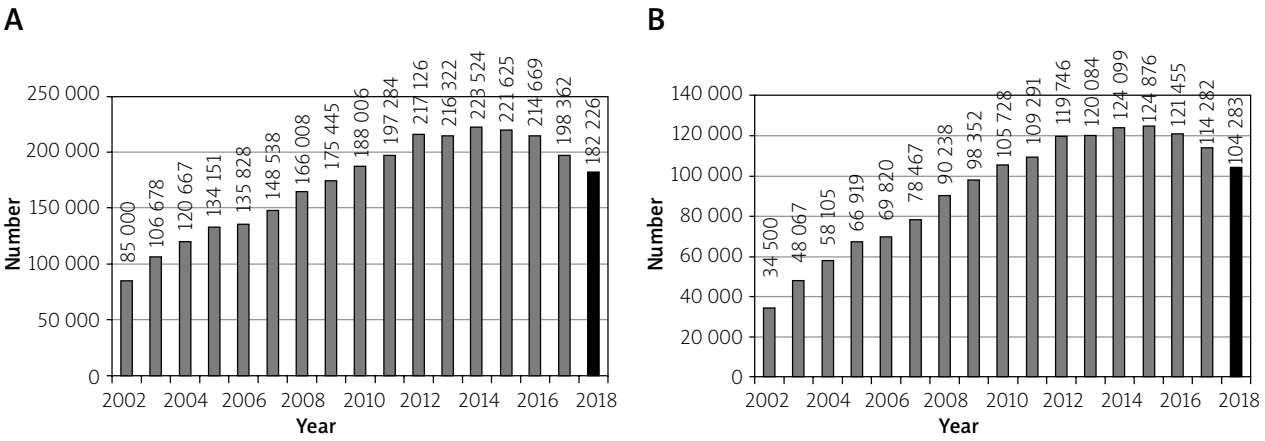

Figure 1. Number of coronary angiography (**A**) and PCI (**B**) procedures in Poland in the years 2002–2018

Table I. Complications of coronary angiography in Poland in 2018

Parameter	Percent	In comparison to 2017
Death	0.04	↓
Stroke	0.01	↔
Major bleeding at access site	0.04	↔
SCA	0.17	↓
Allergic reaction	0.02	↓

SCA – sudden cardiac arrest.

Table II. Complications of PCI in Poland in 2018

Parameter	Percent	In comparison to 2017
Death	0.34	↓
Myocardial infarction	0.11	↔
Major bleeding from access site	0.10	↔
SCA	0.42	↓
Allergic reaction	0.10	↔
Artery perforation	0.20	↑
No reflow	0.55	↔

SCA – sudden cardiac arrest.

Table III. Additional intracoronary assessment in 2018 during angiography and PCI

Parameter	*N*	Change % from 2017
FFR	9076	↑ 12%
IVUS	3652	↑ 44%
OCT	384	↑ 61%

OCT – optical coherence tomography.

cardial infarction (19% STEMI and 20% non-ST-segment elevation myocardial intervention (NSTEMI)), 26% unstable angina (decrease by 4% from 2017) and the remaining 35% for stable angina. The number of primary PCIs per 1 million inhabitants per year is currently 524. There were 67 070 PCIs for ACS, including 20 219 primary PCIs for STEMI, 20 666 for NSTEMI, and 26 185 for unstable angina.

Current generation drug-eluting stents were used in 99% of cases. Only 102 bioresorbable stents were implanted (0.1% of all PCIs). Aspiration thrombectomy was used in only 2477 cases, which corresponds to a 21% decrease in comparison to 2017. A substantial increase in use of guideline-recommended ticagrelor as an adjunct pharmacotherapy was observed both for STEMI (prehospital: 17%, in-hospital: additional 17%) and NSTEMI (prehospital: 0%, in-hospital: 15%) with the use of prasugrel < 1%. PCI complications during PCI are presented in Table II – the values remain stable throughout the years of observations.

In 2018 there was a significant increase in the use of modern imaging and diagnostic techniques such as intravascular ultrasound (IVUS) and fractional flow reserve (FFR). In our opinion the intravascular imaging and physiological assessment of stenosis severity are still underused, but the trend observed in 2018 is reassuring. There is growing awareness of the utility of intravascular imaging for the optimization of PCI especially in anatomically complex lesions (Table III). Optical coherence tomography is still not reimbursed in Poland.

Concerning structural heart disease and vascular procedures, there were 1261 TAVI in 22 centers, 400 left atrial appendage occlusion (LAAO) and 148 MitraClips in 2018, which corresponds to a moderate increase in comparison to 2017. Given the expanding indications for TAVI and confirmed benefits of mitral valve repair with MitraClip, our conclusion is that these procedures are not available to a substantial number of patients with clear indications. It should be noted that transcatheter vas-

cular interventions are performed by vascular surgeons and interventional radiologists and are not reported to the ORPKI database.

In conclusion, the number of coronary diagnostic and therapeutic procedures reported to ORPKI 2018 is lower than in the previous years. On the other hand, we observed increased adoption of the guideline recommended intravascular imaging and physiology assessment, radial approach, new-generation drug-eluting stent (DES) and use of modern antiplatelet drugs. Also the number of structural heart disease interventions slightly increased, but their availability is still suboptimal. Optimization of cathlab structure and location with efficient reimbursement plays a crucial role in the maintenance of Polish interventional cardiology [2, 3]. Also there is a need for increased reporting of the procedures to the ORPKI database. As highlighted before, we always compare against previous data published by ORPKI bearing in mind that some underreporting takes place and seems constant throughout the duration of the registry sine 2004 [4, 5].

This publication presents an analysis of individual procedural data from 163 interventional cardiology centers in Poland that have voluntarily joined the ORPKI database. To account for possible underreporting observed in 2018 AISN PTK makes every effort to correct for the missing data and provide reliable information on interventional cardiology in Poland.

Conflict of interest

The authors declare no conflict of interest.

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