Antiplatelet therapy within 30 days of percutaneous coronary intervention with stent implantation

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Percutaneous coronary intervention with stent implantation (PCI-S) has revolutionised the management of patients with coronary artery disease at high risk of myocardial infarction and stroke.[1] Dual antiplatelet therapy (aspirin with clopidogrel, prasugrel or ticagrelor) is superior to aspirin alone for preventing atherothrombotic events, including stent thrombosis, in patients undergoing PCI-S,[2] and is recommended by Australian guidelines.[3]

We analysed de-identified, linked Pharmaceutical Benefits Scheme (PBS) and Medicare Benefits Schedule (MBS) data for a 10% random sample of Medicare beneficiaries provided by the Australian Department of Health, to quantify rates of antiplatelet drug dispensing within 30 days of PCI-S. We included all patients with MBS claims for PCI-S (items 38306, 38312, 38318) between 1 January 2013 and 30 September 2014. MBS data on PCI-S procedures are available only for private patients, who account for about 45% of PCI-S procedures in Australia.[4] The medicines of interest for our analysis were clopidogrel and clopidogrel/aspirin (Anatomical Therapeutic Chemical [ATC] codes B01AC04 and B01AC30), ticagrelor (ATC code B01AC24), and prasugrel (ATC code B01AC22). Aspirin alone was not examined because over-the-counter use is not captured in PBS claims data. We assessed the association of several factors with antiplatelet medication dispensing within 30 days of PCI-S, expressed as odds ratios, by logistic regression modelling. The New South Wales Population and Health Services Research Ethics Committee approved the study (Cancer Institute NSW reference, 2013/11/494).

Of 2869 patients who underwent PCI-S during the study period, 2592 (90%) were dispensed antiplatelet drugs within 30 days of

Characteristics of patients undergoing percutaneous coronary intervention with stent implantation (PCI-S) in Australia, and their association with dual antiplatelet therapy within 30 days of PCI-S

	Number of patients		Odds ratio (95% confidence interval)	
	Underwent PCI-S	Antiplatelet therapy within 30 days	Univariate models	Multivariate model
Total number of patients undergoing PCI-S	2869	2592 (90%)		
Age (years)				
18–54	351 (12%)	307 (87%)	1	1
55–64	711 (25%)	640 (90%)	1.29 (0.87–1.93)	1.26 (0.83–1.91)
65–74	965 (34%)	879 (91%)	1.47 (0.99–2.16)	1.17 (0.76–1.81)
75–84	660 (23%)	605 (92%)	**1.58 (1.04–2.40)**	1.09 (0.66–1.81)
85 or more	182 (6%)	161 (88%)	1.10 (0.63–1.91)	0.83 (0.66–1.60)
Sex				
Women	670 (23%)	604 (90%)	1	1
Men	2199 (77%)	1988 (90%)	0.97 (0.73–1.30)	0.86 (0.63–1.18)
State where PCI-S was undertaken				
New South Wales/Australian Capital Territory	1121 (39%)	986 (88%)	1	1
Victoria/Tasmania	752 (26%)	694 (92%)	**1.64 (1.19–2.26)**	**1.56 (1.12–2.17)**
South Australia/Northern Territory	147 (5%)	129 (88%)	0.98 (0.58–1.66)	0.94 (0.55–1.60)
Queensland	549 (19%)	504 (92%)	**1.53 (1.08–2.19)**	**1.47 (1.02–2.13)**
Western Australia	300 (10%)	279 (93%)	**1.82 (1.13–2.94)**	**2.14 (1.28–3.59)**
PBS patient category*				
General	1453 (51%)	1293 (89%)	1	1
Concessional	1404 (49%)	1299 (93%)	**1.53 (1.18–1.98)**	**1.63 (1.18–2.26)**
Previous PCI-S				
Preceding 12 months	234 (8%)	199 (85%)	1	1
None	2635 (92%)	2393 (91%)	**1.74 (1.19–2.55)**	1.41 (0.93–2.13)

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	Number of patients		Odds ratio (95% confidence interval)	
	Underwent PCI-S	Antiplatelet therapy within 30 days	Univariate models	Multivariate model
Previous antiplatelet therapy				
Preceding 6 months	1135 (40%)	995 (88%)	1	1
None	1734 (60%)	1597 (92%)	**1.64 (1.28–2.10)**	**1.96 (1.45–2.64)**
Anticoagulant therapy within 30 days of PCI-S				
No	84 (3%)	77 (92%)	1	1
Yes	2785 (97%)	2515 (90%)	1.18 (0.54–2.59)	1.04 (0.47–2.33)
Proton pump inhibitor therapy within 30 days of PCI-S				
No	1002 (35%)	931 (93%)	1	1
Yes	1867 (65%)	1661 (89%)	**1.63 (1.23–2.16)**	**1.42 (1.05–1.92)**
Comorbid conditions (six months before PCI-S)†				
None	196 (7%)	169 (86%)	1	1
1	180 (6%)	165 (92%)	1.76 (0.90–3.42)	1.47 (0.72–3.01)
2	259 (9%)	234 (90%)	1.50 (0.84–2.67)	1.34 (0.71–2.56)
3	389 (14%)	356 (92%)	**1.72 (1.00–2.96)**	1.54 (0.84–2.82)
4	452 (16%)	395 (87%)	1.11 (0.68–1.81)	1.01 (0.57–1.79)
5 or more	1393 (49%)	1273 (91%)	**1.70 (1.08–2.65)**	1.56 (0.88–2.75)

PBS = Pharmaceutical Benefits Scheme. * Patients were classified as concessional beneficiaries if all PBS dispensing was concessional during year preceding and the three months following the PCI-S procedure. † Based on RxRisk comorbidity indices.[5] ◆

the procedure. Dispensing was more frequent for concessional PBS beneficiaries, patients who had not undergone PCI-S in the preceding year, patients not dispensed antiplatelet drugs during the preceding six months, and patients dispensed proton pump inhibitors within 30 days of the procedure. Antiplatelet therapy was also more frequent among patients from Victoria or Tasmania, Queensland, and Western Australia than for those from NSW or the Australian Capital Territory (Box).

Our findings indicate that 10% of patients undergoing PCI-S did not receive guideline-recommended dual antiplatelet therapy within 30 days of their procedure. Cost may have been a barrier, as antiplatelet therapy was less frequent among general than concessional PBS beneficiaries; the maximum out-of-pocket cost for any single PBS item in 2013 was $5.90 for concessional beneficiaries, but $36.10 for general beneficiaries, and general beneficiaries may have already experienced significant out-of-pocket costs for both health insurance and their procedure.

In most states, the Public Hospitals Pharmaceutical Reform Agreement[6] ensures that PBS-subsidised medications can be dispensed to patients when they are discharged from hospital. NSW and the ACT, however, do not participate in this agreement; patients are discharged from public hospitals with unsubsidised medicines sufficient for only 2–7 days, after which they must visit a community doctor for prescribing of PBS-subsidised medications. This inconvenience may contribute to the lower 30-day dispensing rate in these jurisdictions.

We were unable to evaluate the long term clinical effect of antiplatelet therapy as the analysed datasets do not include information about hospital admissions.

The number of PCI-S procedures in Australia increased from 24 500 MBS claims in 2013 to 29 000 in 2018 (http://medicarestatistics.humanservices.gov.au/statistics/mbs_item.jsp), and the number of patients at risk of early stent thrombosis may also have grown. Why some patients undergoing PCI-S are not receiving dual antiplatelet therapy directly after their procedure should be further investigated.

Competing interests: No relevant disclosures. ■

Received 27 August 2019, accepted 18 November 2019

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