ORIGINAL ARTICLE

Optimal duration of dual antiplatelet therapy followed by monotherapy in diabetic patients after percutaneous coronary intervention with drug-eluting stent implantation: a Bayesian network meta-analysis

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KEY WORDS

diabetes, drug-eluting stent, dual antiplatelet therapy, network meta-analysis, percutaneous coronary intervention

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ABSTRACT

INTRODUCTION The standard 12-month dual antiplatelet therapy (DAPT) following percutaneous coronary intervention (PCI) with drug-eluting stent (DES) implantation that is recommended for the general population may not be suitable for patients with diabetes.

OBJECTIVES The study aimed to evaluate the efficacy and safety of short-term (≤3 months), medium-term (6 months), standard-term (12 months), and extended-term (>12 months) DAPT in diabetic patients with DES implantation and to compare the outcomes of DAPT discontinuation followed by monotherapy with aspirin versus a $P2Y_{12}$ receptor inhibitor.

PATIENTS AND METHODS Randomized controlled trials published up to October 10, 2020 were searched in the PubMed, Web of Science, Embase, Cochrane Library, and ClinicalTrials.gov databases. A Bayesian network meta-analysis with a random-effects model was performed. A total of 18 randomized trials involving 20 536 patients with diabetes were included.

RESULTS The network analysis showed that short-term DAPT was the most optimal in terms of reducing the primary endpoint and was superior to extended-term DAPT (odds ratio [OR], 0.48; 95% CI, 0.25–0.85). Standard-term DAPT was also associated with a reduced primary endpoint in comparison with extended-term DAPT (OR, 0.56; 95% CI, 0.32–0.90). There was no noticeable difference with respect to the primary endpoint between short-term DAPT followed by monotherapy with aspirin and a $P2Y_{12}$ inhibitor. No significant differences were observed in secondary endpoints, including all-cause mortality, cardiac mortality, myocardial infarction, stroke, target vessel revascularization, definite or probable stent thrombosis, and major bleeding event.

CONCLUSIONS Short-term DAPT, as compared with extended-term therapy, was associated with a reduced primary endpoint in patients with diabetes after PCI with DES implantation.

INTRODUCTION Patients with diabetes mellitus are at a high risk for severe coronary artery disease, and the incidence of postoperative adverse clinical events in this group is higher than in the general population.[1,2] Dual antiplatelet therapy (DAPT) involves administration of aspirin and a $P2Y_{12}$ receptor inhibitor, and it is the standard treatment used to prevent stent thrombosis and reduce ischemic events after percutaneous coronary intervention (PCI) with drug-eluting stent (DES) implantation.[3,4] Hemorrhage is the most common adverse effect associated with DAPT; therefore, it is important to determine the optimal duration of DAPT to achieve

WHAT'S NEW?

This network meta-analysis included 18 studies comparing 4 different durations of dual antiplatelet therapy (DAPT) to establish the optimal duration of treatment in diabetic patients with previous implantation of a drug-eluting stent. We found that short-term DAPT (≤3 months) was associated with the best treatment response and lowest risk of complications. The findings of this study suggest that short-term DAPT is the most beneficial for patients with diabetes who had undergone percutaneous coronary intervention with drug-eluting stent implantation.

maximum protection against ischemia without the risk of bleeding.[5] Standard DAPT following DES implantation involves administration of aspirin and clopidogrel for 6 to 12 months. Diabetic patients typically take hypoglycemic and hypolipidemic drugs that could cause platelet inhibition, such as statins, which are also metabolized in the liver by the same cytochrome P450 isoenzyme 3A4 pathway as clopidogrel. In light of impaired glucose metabolism and the risk of glucose fluctuation in patients with diabetes, current clinical practice guidelines do not recommend the standard DAPT regimen in this population.[6]

Furthermore, there is no consensus on the duration of DAPT in diabetic patients.[7,8] Multiple randomized clinical trials (RCTs) and observational studies reported contradictory results regarding the optimal length of DAPT in patients with this disease.[9-11] A previous meta-analysis showed no significant difference between extended- and short-term DAPT regimens with regard to adverse clinical outcomes among patients with diabetes mellitus, except that the latter resulted in increased bleeding.[12,13] However, the importance of pre-existing diabetes in determining the optimal duration of DAPT remains unclear. It has not been established whether discontinuation of DAPT and switching to monotherapy with aspirin or a $P2Y_{12}$ inhibitor would increase safety and efficacy outcomes, and currently no head-to-head RCTs are being conducted to verify this aspect.[14]

Therefore, we performed this trial-level network meta-analysis (NMA) of studies that employed various DAPT durations with the aims to identify the optimal length of treatment with DAPT and to find out whether discontinuation of this therapy followed by appropriate monotherapy is beneficial for patients with diabetes.

PATIENTS AND METHODS

The study protocol was registered in the International Prospective Register of Systematic Reviews (PROSPERO; CRD42021231387).

Search strategy and data sources

An electronic search was conducted systematically for articles published from inception up to October 10, 2020 and indexed in PubMed, Embase, Web of Science, ClinicalTrials.gov, and the Cochrane Library databases. References of related articles were also searched to maximize data integrity. The following search terms were used: *dual antiplatelet therapy*, *drug-eluting stent*, *percutaneous coronary intervention*, and *randomized controlled trial*. The detailed search strategy is provided in Supplementary material, *Table S1*.

Inclusion and exclusion criteria

Retrieved articles were screened based on the following predefined inclusion criteria: 1) studies were clinical RCTs; 2) participants were adults with diabetes mellitus who received DAPT after PCI with DES; 3) multiple durations of DAPT were tested, that is, short-term (≤3 months), medium-term (6 months), standard-term (12 months), and extended-term (>12 months) regimens; 4) outcomes reported were primary endpoint, all-cause mortality, cardiac mortality, myocardial infarction (MI), stroke, target vessel revascularization (TVR), stent thrombosis, and bleeding events; and 5) studies included a follow-up of at least 12 months.

The following studies were excluded from analysis: 1) pharmacokinetic or pharmacodynamic studies, meta-analyses, observational studies, case studies, or editorials; 2) studies involving patients who did not have diabetes mellitus; 3) studies that did not set adverse events as a clinical endpoint; and 4) studies involving identical or duplicate trials.

Data extraction and quality evaluation

Two independent investigators (KA and PG) assessed the published articles, adjudicated the data, and reviewed the methodological quality of each eligible study. Any disagreement during the data extraction process was resolved by discussion with a third researcher (SHW). Data on the trial name, year of publication, sample size, treatment and control groups, outcomes, clinical events reported in the diabetes group, and follow-up period were obtained. Risk of bias among the trials was assessed with the revised Cochrane Risk of Bias tool,[15] which consists of preliminary considerations, signaling questions, and 5 domains (bias arising from the randomization process, bias due to deviations from intended interventions, bias due to missing outcome data, bias in measurement of the outcome, bias in selection of the reported result), and the overall risk of bias. Articles were categorized as having low or high risk of bias, or as raising some concerns.

Statistical analysis

We performed a Bayesian NMA with a random-effects model using the Markov chain Monte Carlo method. The GeMTC package was run in R (R Foundation for Statistical Computing, Vienna, Austria) to generate the Bayesian NMA model using the JAGS software. Odds ratios (ORs) and 95% CIs were calculated for the effects of different durations of DAPT to produce summary statistics. Based on noninformative uniform and normal prior distributions,[16] the initial values were set for 4 different chains, and 100 000 interactions with

50 000 burn-in samples were produced to obtain the model parameters from the posterior distributions, with one thinning rate adopted for each chain. Convergence was assessed using trace plots and the Brooks–Gelman–Rubin method to check if the error was smaller than 5% of the standard deviation of the effect estimates and between-study variance.[17] The estimates of the Bayesian NMA were reported as rank probabilities to identify the relative rankings of DAPT duration based on the surface under the cumulative ranking curve (SUCRA), ranging from 0% (statistically certain to be the worst treatment) to 100% (statistically certain to be the best treatment).[18-20]

Heterogeneity was examined with the Cochran *Q* statistic and quantified with the inconsistency statistic (I^2), which was classified as low, moderate, or high for I^2 values under 25%, between 25% and 50%, and over 50%, respectively.[21] A *P* value of less than 0.05 was considered to indicate statistical significance.

Inconsistency was analyzed using the GeMTC package in R, comparing the deviance residuals and deviance information criterion statistics in fitted consistency and inconsistency models to identify any loops in the treatment network where inconsistency existed.[22] The node-splitting approach was also used to assess the inconsistency of the model, in which direct or indirect evidence was separately contrasted for a particular comparison. To validate the robustness of the findings, sensitivity analyses were conducted for the stratification of monotherapy after short-term DAPT (with exclusion of trials with a high risks of bias) and the type of $P2Y_{12}$ inhibitor; trials with a large number of patients that may have limited the generalizability of the achieved results were excluded. The 95% CI value not exceeding 1 was considered statistically significant. All statistical analyses were performed using R 3.6.3 and Stata 14.2 (Stata Corporation, College Station, Texas, United States).

Outcome variables Primary and secondary endpoints were considered. We incorporated definitions of the primary endpoint as applied in each trial. Secondary endpoints were the individual components of the primary endpoint and comprised all-cause mortality, cardiac mortality, MI, stroke, TVR, definite or probable stent thrombosis, and major bleeding. Stent thrombosis was defined according to the criteria of the Academic Research Consortium.[23] Other outcomes are defined in Supplementary material, *Tables S2* and *S3*.

Ethics This network meta-analysis did not require approval by the ethics committee or an appropriate institutional review board.

RESULTS

Search results and study characteristics

Of 3506 retrieved articles, 652 were excluded after removing duplicates and 2830 after reviewing the title and abstract. Additionally, 6 studies were excluded because they contained unpublished data, were observational trials, or could not be grouped appropriately[24-29] (FIGURE 1). Ultimately, 18 trials were included with a total of 20 536 diabetic patients randomly assigned to receive either short-term (≤3 months), medium-term (6 months), standard-term (12 months), or extended-term (>12 months) DAPT regimens.[10,11,30-45] Outcomes of short-term DAPT followed by aspirin monotherapy in comparison with a $P2Y_{12}$ inhibitor monotherapy were also compared. Characteristics of the RCTs included in the NMA are shown in TABLE 1. Detailed inclusion and exclusion criteria of trials are presented in Supplementary material, *Table S4*.

Quality of evidence Detailed evaluation of the risk of bias is summarized in Supplementary material, *Figure S1*. The overall assessment of the results showed that the heterogeneity varied from low to moderate for cardiac mortality (I^2 = 0%), stroke (I^2 = 0%), TVR (I^2 = 6.27%), major bleeding (I^2 = 0%), primary endpoint (I^2 = 28.75%), all-cause mortality (I^2 = 28.19%), and MI (I^2 = 25.51%). High heterogeneity was detected in comparisons of stent thrombosis (definite or probable) (I^2 = 64.76%), although the 95% CIs showed that this result was not significant. Feasible pairwise comparisons with heterogeneity estimates were generated and are shown in Supplementary material, *Table S5*.

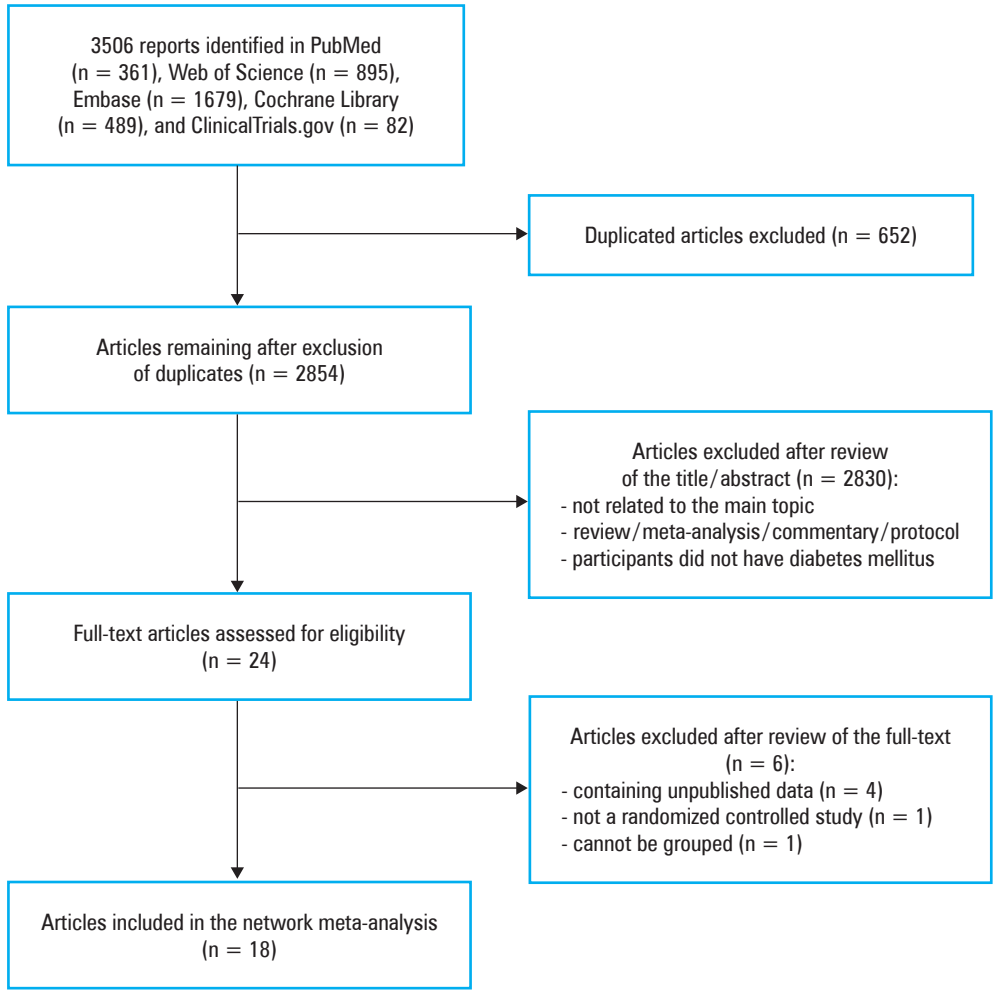
The fit of the consistency model was similar to or better than that of the inconsistency model (Supplementary material, *Table S6*). Inconsistency between the direct and indirect estimates of the node-splitting analysis did not show significant differences in each comparison (Supplementary material, *Table S7*). The convergence diagnosis model could be used to effectively predict the data. We evaluated the convergence of iterations by visual inspection of the chains to establish homogenous parameter estimates and to comply with the Brooks–Gelman–Rubin diagnostic standard (Supplementary material, *Figure S2*).

Network meta-analysis

Efficacy and safety Network plots for different outcomes were generated to illustrate the geometries clarifying which treatments were compared directly or indirectly in the included studies.[46] The network evidence plot of the primary endpoint is shown in FIGURE 2, and that of short-term DAPT followed by a $P2Y_{12}$ inhibitor or aspirin monotherapy and secondary endpoints is shown in Supplementary material, *Figure S3*. Results pertaining to NMA of the primary endpoint using the random-effects model are summarized in TABLE 2. Results of the NMA of other clinical events are shown in Supplementary material, *Table S8*.

Primary endpoint Short- and standard-term DAPT and were associated with a lower risk of primary endpoint (OR, 0.48; 95% CI, 0.25–0.85 and OR, 0.56; 95% CI, 0.32–0.9, respectively) than extended-term DAPT, whereas medium-term

FIGURE 1 Study flow diagram



DAPT showed no significant difference (OR, 0.62; 95% CI, 0.33–1.06). Furthermore, short--term DAPT followed by aspirin monotherapy did not significantly differ from short-term DAPT followed by a $P2Y_{12}$ inhibitor monotherapy in terms of the primary endpoint (OR, 1.12; 95% CI, 0.66–1.84). According to the accumulative rankings by SUCRA, we found that the best possible treatment with an improved primary endpoint was short-term DAPT, while the effect was consistent with medium- and standard-term DAPT. The worst treatment was extended-term DAPT.

Secondary outcomes All-cause mortality was similar for all 4 durations of DAPT. No noticeable difference was also observed in terms of cardiac mortality, MI, or stroke. Similarly, the number of cases of definite or probable stent thrombosis with standard-term DAPT was not significantly different from that with extended-, medium-, and short-term DAPT. A similar trend was also observed for TVR. Major bleeding incidence also did not significantly differ between different DAPT regimens.

Ranking probabilities The ranking probabilities for all treatments included are shown in FIGURE 3 (detailed ranking results for other outcomes are summarized in Supplementary material, *Table S9* and *Figure S4*). For the treatment effect of improving the primary endpoint, short- and standard--term DAPT ranked first, with the highest probability (72.18% and 63.55%, respectively), whereas medium- and extended-term DAPT ranked last (62.84% and 95.32%, respectively). For the effect of reducing all-cause mortality, medium--term DAPT ranked first, with the highest probability (37.59%), whereas extended-term DAPT ranked last (53.43%). Regarding the lower incidence of cardiac mortality and MI, short-term DAPT ranked first, with the highest probability (42.98% and 64.05%, respectively), whereas midterm DAPT ranked last (52.57% and 54.27%, respectively). In the analysis of stroke and TVR, medium-term (76.61%) and standard-term DAPT (44.92%) had the highest probability of achieving a good prognosis, respectively, whereas short--term and medium-term DAPT had the lowest probability (46.15% and 43.52%, respectively). Short-term DAPT was the most appropriate treatment strategy, ranking first in the effect of delaying the progression of definite or probable stent thrombosis (52.67%), whereas medium--term DAPT ranked last (81.18%). The latter was the most favorable treatment in terms of postponing major bleeding events in patients with diabetes (59.08%), whereas extended-term DAPT achieved the worst outcome (89.32%).

TABLE 1 Characteristics of included trials

Trial	Year	Sample size	DAPT groups	Endpoints for diabetes	Follow-up, mo, mean
REAL/ZEST-LATE[10]	2010	704	12-month vs 36-month	Primary endpoint, death from any cause, MI, stroke, definite ST, repeat revascularization, TIMI major bleeding	19.7
RESET[11]	2012	292	3-month vs 12-month	Primary endpoint, death from cardiovascular cause, MI, TVR, definite or probable ST, major or minor bleeding	12
EXCELLENT[30]	2012	550	6-month vs 12-month	Primary endpoint, all-cause death, cardiac death, MI, death/MI, cerebrovascular accident, target-lesion revascularization, TVR, any revascularization, ST, any bleeding, TIMI major bleeding, MACCE	12
OPTIMIZE[31]	2013	1103	3-month vs 12-month	Primary endpoint, definite/probable ST	12
ARCTIC--Interruption[32]	2014	420	12-month vs 30-month	Primary endpoint	17
DAPT[33]	2014	3391	12-month vs 30-month	Definite ST, probable ST, cardiac death, vascular death, noncardiovascular death, MI, stroke, BARC type 2, 3, or 5 bleeding, GUSTO severe or moderate bleeding	17
DES LATE[34]	2014	1418	12-month vs 36-month	Primary endpoint	36
ISAR-SAFE[35]	2015	979	6-month vs 12-month	Primary endpoint	15
ITALIC[36]	2015	685	6-month vs 24-month	Primary endpoint, all-cause death, cardiac death, MI, TVR, minimal bleeding, minor bleeding	24
OPTIDUAL[37]	2015	435	12-month vs 48-month	All-cause mortality, cardiac mortality, MI, stroke, TVR, definite or probable ST, TIMI major bleeding	48
SECURITY[38]	2016	429	6-month vs 12-month	Primary endpoint, all-cause mortality, cardiac mortality, MI, definite or probable ST, TVR, stroke, BARC type 3 or 5 bleeding	24
I-LOVE-IT 2[39]	2016	414	6-month vs 12-month	Primary endpoint, TLF, cardiac death, MI, TLR, all-cause death, BARC type 3 or 5 bleeding	12
IVUS-XPL[40]	2016	506	6-month vs 12-month	Primary endpoint	12
GLOBAL LEADERS[41]	2018	4038	1-month vs 12-month	Primary endpoint, BARC type 3 or 5 bleeding	24
STOPDAPT-2[42]	2019	1159	1-month vs 12-month	Primary endpoint	12
SMART-CHOICE[43]	2019	1122	3-month vs 12-month	Primary endpoint, BARC type 2, 3, or 5 bleeding	12
REDUCE[44]	2019	298	3-month vs 12-month	Primary endpoint	24
TWILIGHT[45]	2020	2620	3-month vs 12-month	BARC type 2, 3, or 5 bleeding, TIMI major or minor bleeding, GUSTO moderate or severe bleeding, ISTH major bleeding, all-cause death, cardiovascular death, MI, stroke, definite or probable ST, NACE	15

Abbreviations: BARC, Bleeding Academic Research Consortium; DAPT, dual antiplatelet therapy; GUSTO, Global Utilization of Streptokinase and TPA for Occluded Arteries; ISTH, International Society on Thrombosis and Hemostasis; MACCE, major adverse cardiovascular and cerebrovascular events; MI, myocardial infarction; NACE, net adverse clinical events; ST, stent thrombosis; TIMI, Thrombolysis in Myocardial Infarction; TLF, target lesion failure; TLR, target lesion revascularization; TVR, target vessel revascularization

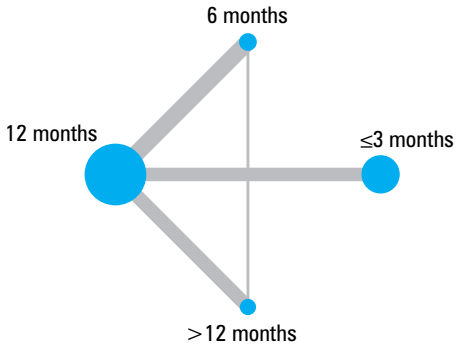


FIGURE 2 Network evidence plot for the primary endpoint

TABLE 2 Estimate results according to the network meta-analysis of the primary endpoint

Short-term DAPT			
0.77 (0.46–1.32)	Midterm DAPT		
0.85 (0.62–1.19)	1.1 (0.73–1.66)	Standard-term DAPT	
0.48 (0.25–0.85)[a]	0.62 (0.33–1.06)	0.56 (0.32–0.9)[a]	Extended-term DAPT

Data are presented as odds ratio (95% CI).

a $P < 0.05$

Abbreviations: see TABLE 1

Sensitivity analyses Sensitivity analyses did not indicate any influence of the estimates in terms of the primary endpoint, all-cause mortality, cardiac mortality, and MI (*Tables S10* and *S11*). Regarding the effect of improving the primary endpoint, all-cause mortality, cardiac mortality, MI, and definite or probable stent thrombosis, short-term DAPT followed by a $P2Y_{12}$ inhibitor monotherapy still ranked first, with the highest probability. One-month DAPT followed by a $P2Y_{12}$ inhibitor monotherapy (50.2%) was potentially associated with better primary endpoint

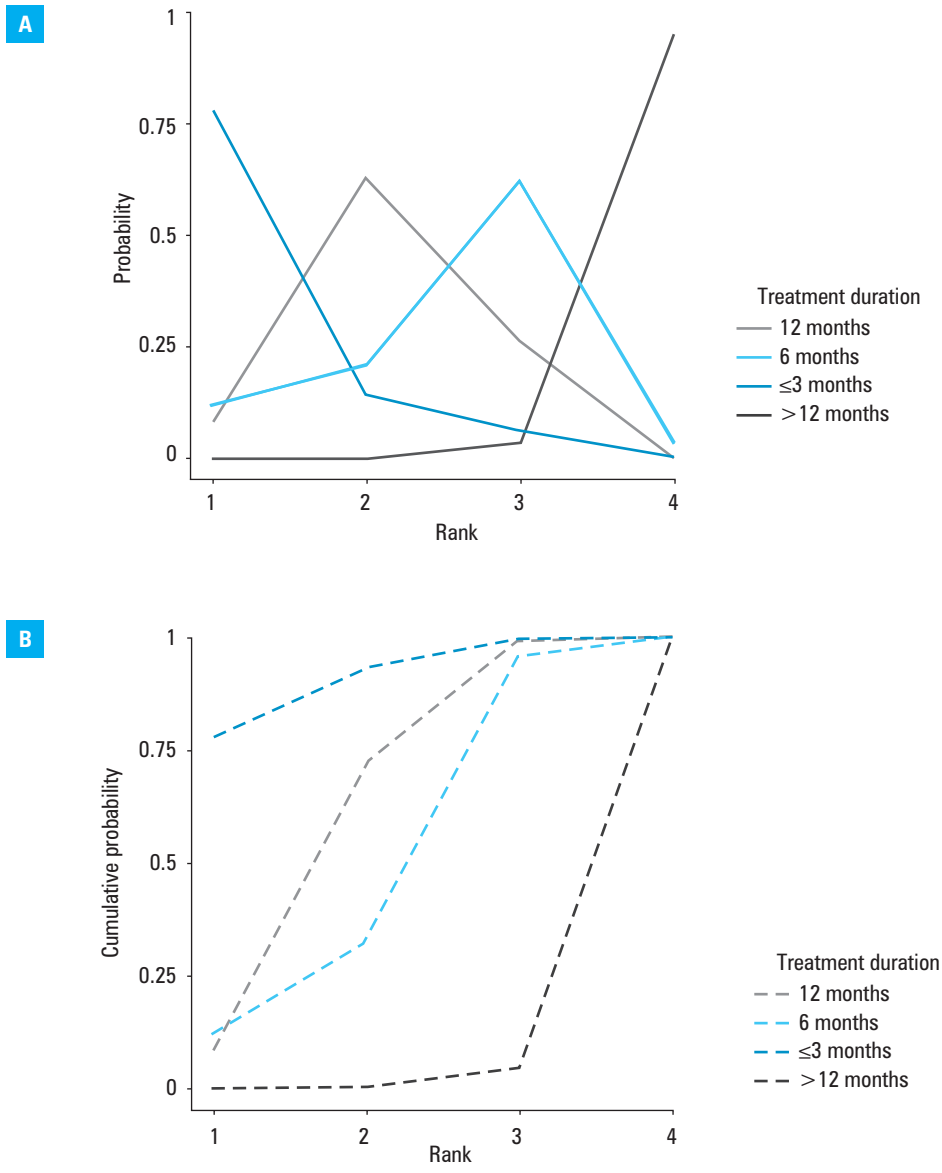


FIGURE 3 Ranking (**A**) and cumulative ranking (**B**) curves of the primary endpoint

than other durations of DAPT. Although the effect was not consistent between medium- and extended-term DAPT in terms of stroke, sensitivity analyses did not indicate any significant difference.

DISCUSSION In this NMA, which included 18 randomized trials involving 20 536 individuals, we comprehensively summarized and analyzed the comparative efficacy and safety of various durations of DAPT for diabetic patients who have undergone PCI with DES. The results showed that short-term DAPT had the highest cumulative probability of ranking first in improving the primary endpoint. Analysis of primary endpoint data showed that short- and standard-term DAPT were significantly better than extended-term DAPT. In addition, short-term DAPT followed by a $P2Y_{12}$ inhibitor monotherapy had a potential advantage over short-term DAPT followed by aspirin monotherapy in terms of reducing the primary endpoint. There was no obvious statistical difference in secondary outcomes between the treatment regimens. With regard to cardiac mortality, MI, and definite or probable stent thrombosis, short-term DAPT had the greatest probability of ranking first (lowest incidence of cardiac mortality, MI, and definite or probable stent thrombosis), and medium-term DAPT had the greatest probability of ranking last. In the evaluation of all-cause mortality, stroke, and major bleeding among patients with diabetes, we found that medium-term DAPT had the highest probability of achieving a good prognosis, whereas standard-term DAPT had the highest probability in terms of TVR. These results were consistent with the outcomes of the sensitivity analysis regarding the primary endpoint, all-cause mortality, cardiac mortality, myocardial infarction, and definite or probable stent thrombosis. Our findings suggest the prognostic significance of optimal DAPT duration in diabetic patients who have undergone PCI with DES.

Our current study indicated that short-term DAPT was associated with better primary endpoint and that there was no difference with respect to stent thrombosis or major bleeding events between short- and extended-term DAPT.

This finding is in contrast with the traditional notion that patients with diabetes, as a high-risk population, should receive DAPT for a prolonged period to reduce the risk of revascularization and to achieve better prognosis. Our results were consistent with those of RCTs indicating that diabetic patients do not gain extra benefit from prolonged DAPT.[31,38] On the other hand, a large-scale trial favored extended-term DAPT owing to the lower rates of MI.[33] Furthermore, an observational study showed that diabetic patients who received prolonged DAPT had a lower risk of death or MI.[9] This finding could be explained by several factors, as mentioned below. Firstly, although diabetic patients are reported to response poorly to clopidogrel,[47] our previous meta-analysis showed that statins did not influence platelet activation and aggregation in individuals receiving clopidogrel.[43] Furthermore, with refinements in DES technologies and the application of new degradable stents, it has become possible to shorten the duration of DAPT rather than reduce the risk of thrombosis at the expense of increasing the risk of bleeding in high-risk diabetic patients.[48]

A number of recent clinical trials, including STOPDAPT-2 (ShorT and OPtimal duration of Dual AntiPlatelet Therapy-2),[42] TWILIGHT (Ticagrelor With Aspirin or Alone in High-Risk Patients After Coronary Intervention),[45] SMART-CHOICE (SMart Angioplasty Research Team: Comparison between a $P2Y_{12}$ antagonist monotherapy and dual antiplatelet therapy in patients undergoing implantation of coronary drug-eluting stents)[43] have explored the efficacy and safety of long-term monotherapy with $P2Y_{12}$ inhibitors following short-term DAPT (≤3 months) after PCI among the general population. Such reports make clinicians consider the possibility of discontinuing aspirin when DAPT is converted to monotherapy. The results of the abovementioned studies, which were based on the comparison of a $P2Y_{12}$ inhibitor monotherapy and long-term DAPT (12–15 months), do not provide a direct answer as to whether monotherapy with aspirin or a $P2Y_{12}$ receptor inhibitor is better for PCI patients who were previously on DAPT. A recent NMA, which included 17 RCTs with a total of 54 625 patients, also reported no significant differences in the incidence of all-cause death, MI, stent thrombosis, stroke, or bleeding events between individuals treated with aspirin and a $P2Y_{12}$ inhibitor (clopidogrel) when short-term DAPT (<6 months) was converted to monotherapy among the general population.[49] Our present results, focused on the population of diabetic patients, revealed a similar trend; namely, that the efficacy and safety of long-term monotherapy with $P2Y_{12}$ inhibitors are not better than those of aspirin, considering the composite primary endpoint.

The results of our study are consistent with those of a recent NMA which suggested that DAPT of less than 6 months may be considered in most patients after PCI with DES[7]; similarly, another NMA reported that in the general population, DAPT lasting up to 6 months followed by monotherapy with a $P2Y_{12}$ inhibitor reduces major bleeding events, whereas extended-term DAPT reduces MI at the expense of higher bleeding risk.[8] We also found that even among high-risk diabetic patients, short-term DAPT remained the best choice to improve the composite primary endpoint.

Although traditional meta-analysis studies have been conducted in patients with diabetes, there is currently no NMA that compares DAPT of various durations. We hope that our NMA would fill this gap and provide directions for future clinical research in this population.

While previous NMA studies have been mostly focused on the general population, our NMA is the first to target diabetic patients. In addition, we classified the duration of DAPT into 4 categories, with standard-term DAPT of 12 months as a reference. This classification allowed us to better understand the clinical significance of short-term DAPT in diabetic patients. Network meta-analyses often yield substantially accurate summary results by combining direct and indirect comparisons.[50]

There are some limitations of this study. Firstly, the NMA source data were based on the collection of published clinical studies, which are bound to include confounding factors. Despite the use of a random-effects model, heterogeneity of the included studies persisted and it could not be fully explained by a single related factor. The relatively small number of trials and categories of P2Y12 inhibitors may have contributed to the heterogeneity, as could the different therapeutic durations of DAPT and follow-up periods. In addition, data of diabetic patients with both low- and high-risk clinical profiles were included, and this also could have influenced the heterogeneity. Although all studies included in this NMA are officially published RCTs, the consistency and translational potential of the data should still be considered while interpretating the results. Secondly, we performed a quantitative NMA based mostly on trial-level data, which could have led to inaccurate results owing to the lack of original individual patient data. Finally, we analyzed some outcomes with pooled definitions which may have resulted in heterogeneity.

Conclusions We found that short-term DAPT, as compared with extended-term DAPT, was associated with a reduced primary endpoint in diabetic patients after PCI with DES implantation. Although the optimal duration should be decided based on the individual risk-to-benefit ratio considering ischemic and bleeding events, this study suggested that short-term DAPT followed by monotherapy with $P2Y_{12}$ inhibitors may be the best strategy for most diabetic patients after previous PCI with DES implantation.

SUPPLEMENTARY MATERIAL

Supplementary material is available at www.mp.pl/paim.

ARTICLE INFORMATION

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CONTRIBUTION STATEMENT KA and PG selected the relevant studies and assessed the data. KA, PG, SQ, WZ, WC, and JS contributed to the methodological framework. KA wrote the manuscript. SW revised the manuscript. All authors read and approved the final version of the manuscript.

CONFLICT OF INTEREST None declared.

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