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Review

Dual antiplatelet therapy after coronary stent implantation: Individualizing the optimal duration

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ABSTRACT

Dual antiplatelet therapy (DAPT) with a $P2Y_{12}$ receptor antagonist in addition to aspirin is the antiplatelet treatment of choice in patients undergoing percutaneous coronary intervention. Despite DAPT being one of the most widely investigated treatment strategies in the cardiology field, its optimal duration after coronary stenting remains controversial. The balance between the possible benefit of preventing a thrombotic event and the risk of suffering a bleeding complication due to maintenance of therapy is of critical relevance to determine the duration of DAPT in a given patient. Indeed, extended DAPT is associated with a reduction in non-fatal ischemic outcomes, at the cost of increasing the risk of bleeding events. Of note, several factors related to the patient, the procedure, or the device implanted may influence the ischemic and/or bleeding risk profiles of a given patient. Therefore, it is reasonable to recommend that the decision on DAPT duration should be individualized on a case-to-case basis. This review aims to provide a comprehensive overview of the current status of knowledge on duration of DAPT after coronary stenting, focusing on the evidence provided mainly by randomized clinical trials, as well as to discuss the factors that may influence the individual ischemic and bleeding risk profiles for a given patient, and whether the use of risk scores may inform the decision-making process for determining DAPT duration.

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Introduction

Dual antiplatelet therapy (DAPT) with a $P2Y_{12}$ receptor antagonist in addition to aspirin remains the antithrombotic treatment of choice in patients with acute coronary syndromes or undergoing percutaneous coronary intervention (PCI) [1–6]. In spite of the large amount of evidence supporting DAPT as the cornerstone treatment in these settings [7,8], the optimal duration of DAPT in patients receiving coronary stenting is yet to be fully elucidated. In particular, there is a clear trade-off between the benefit obtained with DAPT in preventing recurrent ischemic events and an increased risk of bleeding, which is directly related to treatment length. Of note, both ischemic and bleeding events are known to have a negative impact on prognosis [9–11]. The European Society of Cardiology (ESC) and the American College of Cardiology/American Heart Association (ACC/AHA) have recently revised their recommendations regarding DAPT duration, underscoring the relevance of the subject [12,13].

The optimal duration of DAPT in a given patient is determined by the balance between the individual risks of presenting a recurrent ischemic event or a hemorrhagic complication due to maintained antithrombotic treatment. Therefore, a personalized approach appears to be reasonable when defining the optimal duration of therapy that should theoretically minimize the combined risk of both ischemic and bleeding adverse events. The aim of the present manuscript is to provide a comprehensive overview of the current status of knowledge on duration of DAPT, focusing on the results obtained in randomized clinical trials evaluating different strategies of DAPT duration and the available evidence regarding clinical, procedure- or device-related factors that may help weighing ischemic and bleeding risks and, thus, individualizing DAPT duration.

Optimal duration of DAPT: available evidence

Randomized clinical trials

The results of 14 randomized clinical trials comparing different strategies of DAPT duration in patients undergoing coronary stent implantation (mostly newer-generation stents) have been published to date (Fig. 1). These trials can be divided into two groups according to their hypotheses regarding the primary endpoint: (a)

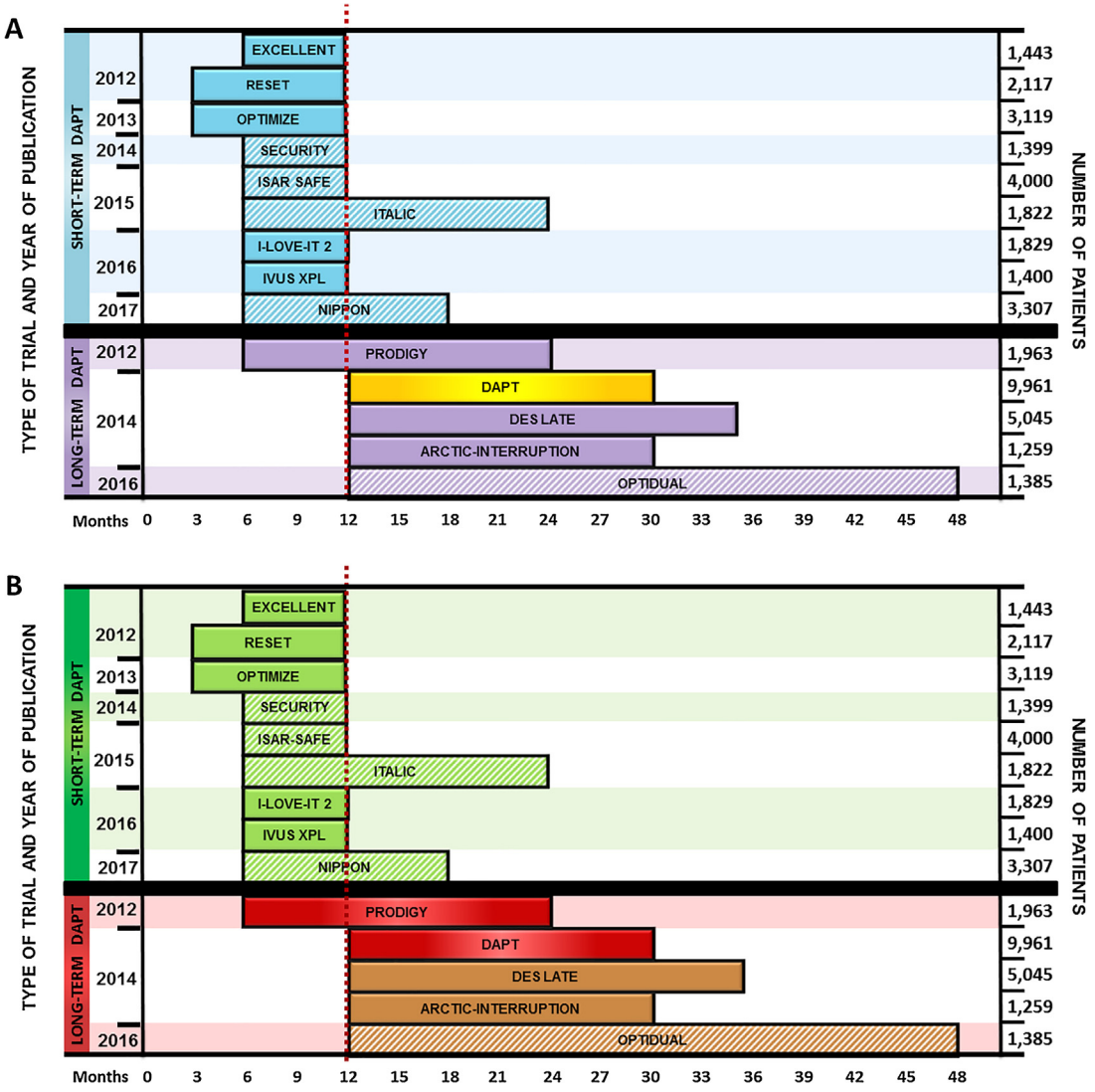

Fig. 1. Trials of DAPT duration after PCI. (A) Results for the primary endpoint. Bars colors indicate whether the hypothesis of the primary endpoint was demonstrated (blue for non-inferiority of short compared to long DAPT duration in short-term trials and orange for superiority of long compared to short DAPT duration in long-term trials) or not (purple for not confirmed superiority of long compared to short DAPT duration in long-term trials). (B) Results for the key safety endpoint of bleeding. Bars colors indicate whether a significant difference in the key safety endpoint of bleeding was observed (red for significant difference in long-term trials) or not (green for short-term trials and brown for long-term trials). White-striped bars indicate that the trial was prematurely stopped before completing the planned enrolment. DAPT, dual antiplatelet therapy.

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