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A Bridge Too Far? Risks and Benefits of Perioperative Bridging Therapy

Jordan Buchholz

University of North Dakota

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Abstract

The long-term use of oral anticoagulants is common among high-risk patient populations for the prevention of thromboembolic events such as stroke, pulmonary embolism, etc. It is estimated that 15-20% of chronically anticoagulated patients will undergo a surgery or procedure that will require anticoagulation interruption annually. During this interruption period, “bridging” anticoagulant therapy is often utilized with unfractionated heparin or low-molecular weight heparin to ensure adequate anticoagulation is achieved. However, there has been an ongoing debate whether or not the benefits of perioperative anticoagulant bridging therapy outweigh its risks. This literature review focuses on whether or not forgoing anticoagulant bridging therapy increases the risk of peri/postoperative thromboembolic events. It also focuses on the whether or not initiating bridging therapy places patients at a higher risk for postoperative bleeding. Finally, it focuses on the current recommendations and whether or not utilization of individualized risk assessment tools increases efficacy and safety in regards to determining appropriate bridging therapy. The results of this literature review concludes that if risk patients there is sufficient evidence to support that non-bridging therapy is non-inferior to bridging therapy in the prevention of peri/postoperative thromboembolic events. There is also evidence to support that anticoagulant bridging therapy may place low risk patients at a significantly higher risk for peri/postoperative bleeding events. Finally, there appears to be sufficient evidence to support the use of individualized risk assessment tools to help guide clinicians in their decisions regarding anticoagulant bridging therapy.

Research Question

The long-term use of oral anticoagulants is common among high-risk patient populations for the prevention of thromboembolic events such as stroke, pulmonary embolism, etc. It is estimated that 15-20% of chronically anticoagulated patients will undergo a surgery or procedure that will require anticoagulation interruption annually. During this interruption period, “bridging” anticoagulant therapy is often utilized with unfractionated heparin or low-molecular weight heparin to ensure adequate anticoagulation is achieved. However, there has been an ongoing debate whether or not the benefits of perioperative anticoagulant bridging therapy outweigh its risks. This literature review focuses on whether or not forgoing anticoagulant bridging therapy increases the risk of peri/postoperative thromboembolic events. It also focuses on the whether or not initiating bridging therapy places patients at a higher risk for postoperative bleeding. Finally, it focuses on the current recommendations and whether or not utilization of individualized risk assessment tools increases efficacy and safety in regards to determining appropriate bridging therapy. The results of this literature review concludes that if risk patients there is sufficient evidence to support that non-bridging therapy is non-inferior to bridging therapy in the prevention of peri/postoperative thromboembolic events. There is also evidence to support that anticoagulant bridging therapy may place low risk patients at a significantly higher risk for peri/postoperative bleeding events. Finally, there appears to be sufficient evidence to support the use of individualized risk assessment tools to help guide clinicians in their decisions regarding anticoagulant bridging therapy.

Introduction

Oral anticoagulants are commonly used long-term in patients with atrial fibrillation, a history of a mechanical heart valve, or a recent history of thromboembolic events. It is estimated that 15-20% of chronically anticoagulated patients will undergo an elective or emergent surgery or procedure that will require anticoagulation interruption annually (Garwood et al., 2017). During this interruption period, “bridging” anticoagulant therapy is often utilized with unfractionated heparin or low-molecular weight heparin to ensure adequate anticoagulation is achieved and to reduce the risk of a thromboembolic event perioperatively (Ayoub et al., 2016). Current debate whether thromboembolic events caused by perioperative anticoagulant interruption posts a larger risk for patients than intra/postoperative bridging for those who initiate bridging therapy (Disuketi et al., 2015).

Statement of the Problem

There is currently a lack of updated evidence-based guidelines and recommendations in regards to indications for perioperative bridging therapy.

The most recent antithrombotic guidelines come from the American College of Chest Physicians (ACCP) in 2012.

Current guidelines are a low-level recommendation (Level 2C).

To date, there remains to be an anticoagulant bridging therapy that is universally accepted which tailors an individual’s thromboembolic risk factors (Peng et al., 2009).

There is a need for additional high-level studies, and evidence-based guidelines to help guide clinicians.

Research Question

Does forgoing perioperative anticoagulant bridging therapy in patients who are chronically anticoagulated place them at a higher risk for a postoperative thromboembolic event vs those patients who initiate bridging therapy?

Does initiating perioperative anticoagulant bridging therapy in patients who are chronically anticoagulated place them at a higher risk for a major in intrapostoperative bleeding event vs those patients who forgo bridging at 0.47% vs 0.95% in the daperin group (risk difference, 0.1 percentage points, 95% CI, 0.02-0.24; P = 0.81).

Should patients undergoing perioperative anticoagulant interruption be assessed using individualized risk assessment tools vs standardized bridging protocols to determine the need for anticoagulant bridging therapy?

Literature Review

Anticoagulant Bridging Therapy: Thromboembolic Risks

Douketis et al. (2016) found that the placebo group had superior outcomes in reducing bleeding risks as compared to the bridging group. These results indicate that the placebo group had superior risks for postoperative bleeding. It is estimated that 15-20% of chronically anticoagulated patients who are chronically anticoagulated place them at a higher risk for a postoperative thromboembolic event vs those patients who initiate bridging therapy.

A study by Douketis et al. (2016) found from their BRIDGE trial that the occurrence of major bleeding was significantly lower than the risk associated with no bridging (23.3% vs 19.4%, P = 0.587) and thromboembolic events (4.1% vs 0.3%, P = 0.004).

Douketis et al. (2016) performed a risk stratification analysis of bleeding and thromboembolic events between the bridged and non-bridged groups at 30 days or up to 3 months. They identified in all-cause mortality (OR, 1.29; 95% CI, 0.15-11.52; P = 0.82), cerebral vascular accident (OR, 0.93; 95% CI, 0.34-2.51; P = 0.88), or thromboembolic events (OR, 0.72; 95% CI, 0.72-2.80; P = 0.64) between the heparin bridging group and the non-bridging group at 30 days and up to 3 months. The results demonstrate no significant adverse effects in thromboembolic events with the non-bridging group as compared to the HBA group.

Anticoagulant Bridging Therapy: Bleeding Risks

Douketis et al. (2016) found the occurrence of major bleeding events in the placebo group at 37 days post follow-up was 1.3% (12 of 918) compared to 0.95% (9 of 915) in the daperin group. These results indicate that the placebo group had superior outcomes in reducing bleeding risks as compared to the bridging group (relative risk, 0.41; 95% CI, 0.20 to 0.78; P = 0.005 for superiority).

Douketis et al. (2016) showed an increase in major bleeding events at one month post follow-up in the bridging group as compared to the non-bridging group (OR, 0.72; 95% CI, 0.20-2.51; P = 0.81). However, in the 2-month and 3-month follow-ups there was no difference in bleeding events between the two groups (HR 0.93, 95% CI, 0.70-1.23; P = 0.99).