Antithrombotic Therapy in Patients Postcardiac Interventions

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ABSTRACT

Many primary care doctors need to know exactly how to manage antithrombotic medication of patients who have earlier undergone a cardiac intervention or surgery, if they come for a noncardiac problem. This article addresses this important issue.

Keywords: Antithrombotic management, Cardiac interventions, Cardiac surgery.

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INTRODUCTION

Cardiovascular interventions have become common in contemporary medical practice. Patients with various cardiac diseases undergo surgical or percutaneous procedures in tertiary medical care centers. Sometimes these patients may develop common, noncardiac medical or surgical problems which need to be treated by the primary care physicians or surgeons depending on the condition. So, it is important that every physician/surgeon should be familiar with common cardiac conditions and various regimens of antithrombotic therapy used in such situations.

Some common categories of such patients are: antithrombotic therapy in patients with prosthetic heart valves, antithrombotic therapy in patients of CABG, antithrombotic therapy in patients with coronary stents.

Antithrombotic Therapy in Patients with Prosthetic Heart Valves

Prosthetic heart valves are of two types—mechanical and tissue valves. Tissue valves are usually used in elderly patients as most tissue valves have limited life span. Mechanical heart valves are used in younger patients but require lifelong anticoagulation therapy.

Tissue Valves

These valves are made from biological materials usually bovine or porcine. Mitral biological valves have stents. Aortic tissue valves may be stented or stentless. Valves made from human cadavers are called homografts and are mostly used in aortic position. Tissue valves have limited life span and are used in patients more than 65 years of age. Degeneration of tissue valves is slower in older patients. It should not be used in young or adolescent patients as there may be accelerated degeneration.

Advantage of Tissue Valves

These valves do not require long term anticoagulation. Some authorities advocate 3 months of anticoagulation in patients of mitral bioprosthesis. Anticoagulation is not required in patients with stentless aortic valves or aortic homografts. A few surgeons advocate 3 months of anticoagulation in patients with stented aortic valve while others think only aspirin is enough for patients with aortic bioprosthesis.

Disadvantages of Tissue Valves

All tissue valves have finite life. In elderly patients, rate of degeneration is slower. Many patients with tissue valve may require reoperation after 5 to 15 years. Moreover, tissue valves are more expensive than mechanical valves. Reoperation risk has to be explained to patients before implanting tissue valve as many patients may not want second surgery due to fear and/or economic reasons.

Mechanical Valves

These valves are made up metal or synthetic materials. These valves last throughout a patient’s lifetime. Patient has to be on anticoagulant for the rest of his/her life. Oral anticoagulation is preferred. Level of anticoagulation is monitored by prothrombin time (PT) and international normalized ratio (INR) estimation. Target level of therapeutic INR in patients of prosthetic heart valves is between 2.0 and 3.0.

Oral anticoagulant agents are vitamin K antagonists (like warfarin and accecoumarin). So, any food which contains high amount of vitamin K will decrease their effectivity. Vitamin supplements containing vitamin K will have similar effect. Large amount of vitamin K rich food can lead to
thrombotic complication. Foods rich in vitamin K include the following: green leafy vegetables, kiwifruit, grapes, avocado, cheese, soybean oil, egg yolk. These foods are to be avoided by patients taking oral anticoagulants.

Surgical Procedure in Patients on Anticoagulants

Elective Surgery

Patient should be admitted 3 days prior to elective procedure. Oral anticoagulant should be stopped. Intravenous heparin is to be started with estimation of clotting time (CT) before each dose. Usually to start off, injection heparin 5000 units is given every 6 hourly. If CT is more than 10 minutes, interval of dosing is to be increased. Once INR is less than 1.5, elective surgery can be performed. Heparin is stopped 4 to 6 hours prior surgery. Postoperatively, heparin can be restarted depending on the comfort level of the operating surgeon.

Emergency Surgery

Patient should be transfused fresh frozen plasma (FFP) to bring the INR to less than 1.5 and once this is achieved surgery can be performed safely. Postoperative management remains similar to elective surgery. Injection vitamin K should be avoided and FFP should be used liberally. In life-threatening bleeding injection, vitamin K may be used in reduced doses. Once vitamin K is used, patient may become refractory to oral anticoagulant for an unpredictable period of time.

Pregnancy in Patients with Heart Valve

In first and third trimester, patients may be switched to heparin, unfractionated heparin (UFH) or low molecular weight heparin (LMWH). There is added risk to fetus if oral anticoagulation is continued in first trimester. Some clinicians advocate continuation of oral anticoagulation till the time of delivery when patient is switched to heparin. Child birth can be managed in a fashion similar to the protocol for elective surgery noted above.

Antithrombotic Therapy in Patients having undergone CABG

Conventionally, patients are put on aspirin after CABG. Recent meta-analysis suggests dual antiplatelet therapy improves graft patency after CABG. This meta-analysis analyzed five randomized controlled trials and six observational studies involving 25,728 patients. The conclusions of the meta-analysis as follows:

A. Early SVG occlusion rate was reduced with dual antiplatelet therapy (p = 0.02).
B. In hospital, 30-day mortality was lower with aspirin and clopidogrel (p < 0.0001).
C. In a pooled analysis of studies involving off-pump CABG compared to aspirin alone, dual antiplatelet therapy reduced the risk of perioperative myocardial infarction and saphenous vein graft occlusion by 68 (47 to 71%) and 55% (2 to 79%) respectively.

Moreover, patients of CABG are prone to deep venous thrombosis (DVT) and should receive DVT prophylaxis as per institutional protocol. Surgical intervention in patients with antiplatelet therapy is discussed later.

Antithrombotic Therapy in Patients with Coronary Stents

Dual antiplatelet therapy is routine after stents. Whenever a patient who has undergone a coronary angioplasty and stenting or CABG goes for a noncardiac surgery (NCS), the dilemma is whether to stop antiplatelet agents or continue them in the perioperative period. Cessation of antiplatelet therapy in the perioperative period can lead to rebound thrombotic phenomenon which can result in stent or graft thrombosis that may be fatal. At the same time, continuing antiplatelet therapy in the perioperative period may pose a threat of increased risk of bleeding. American College of Cardiology recommends that elective noncardiac surgery should be ideally delayed for at least 12 months in case of DES and 1 month in case of a bare metal stent. There are no available recommendations for patients who have undergone CABG. However, if an emergency surgery has to be performed, there are basically three possible scenarios of temporary withdrawal of oral antiplatelet drugs for planned NCS according to bleeding risk of surgery.

1. Surgery with low bleeding risk, e.g. cataract surgery, oral dental surgery, etc. Interruption of oral antiplatelet therapy is not necessary, irrespective of the ischemic risk profile. Continue both aspirin and clopidogrel.
2. Surgery with intermediate bleeding risk, e.g. GI surgeries, cholecystectomy, appendicectomy, etc. Continue aspirin during perioperative period. Stop clopidogrel 5 days prior to surgery with reintroduction as soon as possible.
3. Surgeries with high bleeding risk, e.g. intracranial surgeries, prostate surgery, aortic surgery, ENT surgeries and surgery in posterior segment of eye. Stop aspirin and clopidogrel 7 days before planned surgery and substitute with alternative antithrombotic therapies. Regular treatment should be resumed as soon as possible after surgery.

Alternative antithrombotic therapy has revolutionized in recent times with introduction of short acting potent anti-
platelet agent tricagrelor. Clopidogrel and aspirin can be stopped and patient can be switched to tricagrelor 90 mg twice daily. This can be stopped two days before planned surgery and patient can be put on LMWH in a dose of 85 to 100 iu subcutaneously 12 hourly. After the surgery is performed LMWH can be restarted as early as 6 hours (range 6-24 hours depending on the type of surgery, risk of bleeding and risk of thrombotic complications and the comfort level of surgeon). Preoperative antiplatelet therapy may be resumed after 48 hours or more when there is no risk of bleeding.

CONCLUSION

Antithrombotic therapy is lifesaving in patients with cardiac interventions. However, in certain clinical conditions, this can be double-edged sword when there is a high risk of bleeding and thrombosis. Attempts to reduce bleeding are associated with increased risk of thrombotic complications. Balancing both ends of spectrum with proper antithrombotic strategy and individualized approach is essential in such tricky situations.

REFERENCES