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Performing diagnostic radial access coronary angiography on uninterrupted direct oral anticoagulant therapy: a prospective analysis

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Transradial access has long been championed as the safer route for those undergoing diagnostic coronary angiography or percutaneous coronary interventions (PCI). Numerous studies have established its overall safety even in the context of an acute ST-elevation myocardial infarction (STEMI).[1 2] However, little data exist on the safety of transradial access in those on direct oral anticoagulants (DOAC). Conventionally, many interrupt these agents prior to coronary intervention irrespective of the access site selected. There is concern, however, that interrupting anticoagulation for those at high risk poses an unacceptable risk of stroke and embolisation. There is equal concern that continued anticoagulation increases bleeding, both access and non-access sites. Several trials have already determined the safety of cardiac catheterisation with continued vitamin K antagonists.[3–6] Currently, there is paucity of randomised data shaping guidelines and practice regarding continued direct oral anticoagulation prior to cardiac catheterisation. The Perioperative Anticoagulant Use for Surgery Evaluation study is an ongoing randomised prospective trial with highly anticipated results. It is designed to address the unanswered question of the safety of interrupting DOAC for atrial fibrillation before elective surgery/procedure. This study includes three parallel cohorts, one for each DOAC. The type of DOAC, renal function and surgery/procedure-related bleeding risk are factored int. The secondary aim is to determine the effect of the preprocedure interruption on residual anticoagulation when measured by the dilute thrombin time for dabigatran and antifactor Xa levels for rivaroxaban and apixaban.[7]

Chongprasertpon and colleagues also address this pressing topic in their publication.[8] This is a prospective study of 49 patients who underwent transradial coronary angiography while on chronic anticoagulant therapy and 49 controls who were not anticoagulated. Among others, they report the CHA_2DS_2-VASc score, HAS-BLED score, periprocedural complications, duration of radial artery compression and major and minor bleeding (classified according to the Thrombolysis in Myocardial Infarction (TIMI) criteria). Of note, those undergoing ad hoc PCI were excluded from this trial. This in itself narrows the applicability of this study's results excluding any intervention especially emergent PCI in the setting of an STEMI. The mean age for the control arm was 61.7±10.8 and for the continued DOAC arm was 66.9±11.3 years. The notable age difference between the two arms could bias the outcomes.

Eighty-six per cent of the control arm underwent coronary angiography through a 5 French sheath and 86% of the uninterrupted DOAC arm through 4 and 5 French sheaths. A total of 3000–5000 units of unfractionated heparin (UFH) were administered in all those in the control group. None of the patients in the DOAC uninterrupted group received UFH. This practice is controversial today. Many transradial operators administer higher doses of UFH to reduce the risk of radial artery occlusion. The SPIRIT of ARTEMIS trial (Multicenter Randomized Evaluation of High Versus Standard Heparin Dose on Incident Radial Arterial Occlusion After Transradial Coronary Angiography) presented compelling data showing that compared with standard doses, high doses of UFH use had a lower radial artery occlusion as detected by Doppler ultrasound. This was not offset by a higher local haematoma, BARC type 3 bleeding (Bleeding Academic Research Consortium) or transfusions. Furthermore, the median haemostasis time

did not differ significantly between both groups (3.5 hours vs 3.7 hours).[9]

In Chongprasertpon's study, radial artery compression was performed with several devices, namely the Safe-Guard Radial Compression Device (Merit Medical) and TR Band Radial Compression Device (Terumo Interventional Systems) used at the discretion of the operator. The mean duration of radial compression for the control group was 235.8±62.8 min and for the DOAC uninterrupted group was 258.4±56.5 min which was not statistically different. Although Chongprasertpon *et al* did not demonstrate a statistically significant difference between the compression duration between the two arms, compression in the continued DOAC group was numerically longer and there was a trend for significance. Additionally, for diagnostic procedures, these times are significantly longer than current standard practices which emphasise reduction of radial artery occlusion (60 min after a diagnostic procedure and 120–180 min after PCI). The Compression of Radial Arteries Without Occlusion I, II and III studies demonstrated that shorter compression times resulted in lower occlusion rates (9.4% with 4 hours of compression, 4.8% with 3 hours, 3.0% with 2 hours and 2.3% with 1.5 hours).[10]

In terms of safety outcomes, no early postprocedural complications occurred in either group, namely TIMI bleeding and strokes/transient ischaemic attacks. Both arms had one access site bleed which was controlled with prolonged compression. These patients had a higher HAS-BLED score. The overall average HAS-BLED score for the continuous DOAC arm was 1.2. Extrapolating safety in higher scores from this trial is impossible.

There are several other limitations to this study. First and foremost is the sample size. A power analysis before or after the study would help ascertain the significance of these results. Given the small numbers, differentiating outcomes for each individual DOAC is not possible. Using four different DOACs further compounds the results. With such a small sample size, focusing on one DOAC may have allowed for a cleaner analysis of safety. In terms of the study design, those who were not on anticoagulation served as the control arm. However, using a control arm comprised those who were on DOAC which is withheld before the angiogram could prove more valuable from a clinical perspective.

It is important to recognise that these are results obtained from a single centre. The number of transradial procedures and expertise of this centre need to be factored in before determining the relevance of the results on a wider scale. The small sample size brings to question whether these were consecutive patients or not. If not, multivariable analysis or paired analysis based on a propensity score may clarify the selection.

Overall, Chongprasertpon *et al* identified a clinically relevant question. However, results from a larger randomised cohort are necessary for a change in practice and guidelines. It is also imperative to design a trial that includes those undergoing PCI to minimise the number of times anticoagulant therapy is interrupted with all the implications of rebound thrombosis, cost and readmissions.

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