Bridging anticogulation in CKD Patients in the community: Walking through the fog. A practical Approach

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Introduction

Chronic oral anticoagulation frequently requires interruption for various reasons and durations. Whether or not to bridge with heparin or other anticoagulants is a common clinical dilemma. The evidence to inform decision making is limited, making current guidelines equivocal and imprecise. Moreover, indications for anticoagulation interruption may be unclear (1).The dilemma is more with patients with advanced kidney impairment as it is now well established that impaired kidney function is associated with increased risks of stroke and of bleeding associated with the use of anticoagulation (2).

Aim of the work

To develop and implement a practical bridging algorithm for advanced CKD patients, easy and safe to be practiced in the community.

Methods

In January 2015 a suggested bridging algorithm launched in the quality and safety meeting of the renal department at University Hospital of Wales. This algorithm based on an audit in which all patients were bridged in hospital and with unfractionated heparin. We started to apply this algorithm for patients in the community using LMWH. This necessitated adding more details and some modifications to the algorithm to be more practical .

Suggested Algorithm*

* Not for patients with MHV or patients who have a high risk for significant bleeding postoperatively

Results

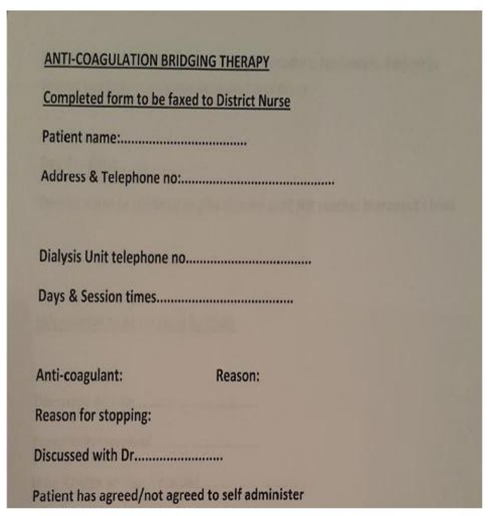
A. We bridged our first eleven cases as a pilot group. Nine patients were on HDF in satellite units and two were pre- dialysis patients .All are on long term anticoagulation with warfarin, six with AF, two PE , one AF and TIA , one DVT and one CVA . Five of them bridged for permecath removal, five for AVF formation and one for fistuloplasty. The principles of the algorithm are as follows: **First :** Descicion making: based on risk stratification for thrombosis (low,moderate and high risk) and risk of bleeding due to the procedure. CHADS2 score used to stratify AF patients while the criteria adopted by American Cardiology College of Physicians (ACCP) used to stratify PE patients. Patients with metallic heart valves or patients who have a high risk for significant bleeding postoperatively were excluded from outpatient bridging. As AF patients` CHADS2 scores were above 2 and PE patients` were less than 12 months all were for eligible for bridging.

Table. Risk Stratification for Perioperative Arterial and Venous Thromboembolism to Guide Whether Bridging Anticoagulation Is Needed

	Clinical Indication for Warfarin Therapy		
Thromboembolic Risk Category	Atrial Fibrillation	Mechanical Heart Valve	Venous Thromboembolism
High risk (annual risk >10%)*	$CHADS_2$ score 5 or 6	Any mechanical mitral valve	Recent (within 3 mo) VTE
	Recent (within 3 mo) stroke/TIA	Older aortic mechanical valve (caged-ball, tilting disk)	High-risk thrombophilia‡
	Rheumatic valvular heart disease	Recent (within 3 mo) stroke or TIA	
Moderate risk (annual risk 5% to 10%)	$CHADS_2$ score 3 or 4	Bileaflet aortic valve prosthesis with ≥1 risk factor†	VTE within 3–12 mo
			Moderate-risk thrombophilia§
			Recurrent VTE
			Active cancer‖
Low risk (annual risk <5%)	$CHADS_2$ score 0–2 (no prior stroke or TIA)	Bileaflet aortic bileaflet without any risk factors†	VTE >12 mo ago

$CHADS_2$ indicates score based on cardiac failure-hypertension-age-diabetes-stroke; VTE, venous thromboembolism; and TIA, transient ischemic attack.
*Additional patients who may be at high risk include those with prior thromboembolism during interruption of warfarin.
†Age ≥75 years, atrial fibrillation, congestive heart failure, hypertension, diabetes mellitus, or stroke or TIA.
‡Deficiency of protein C, protein S, or antithrombin; antiphospholipid syndrome; homozygous factor V Leiden or prothrombin gene mutation.
§Heterozygous factor V Leiden or prothrombin gene mutation.
‖Cancer that is metastatic or treated within the past 6 months.

Second : Essential Communications : vascular access CNS arranged date for procedure and booked it in the day unit , radiology department or theatre. Vascular nurses communicated with district nurses, dialysis unit staff and patients to provide all the informations. For proper communication information sheets designed to be sent to district nurses and patients including INR request for the day before the procedure (see forms below). Sheets included contact details for relevant staff.



ANTI-COAGULATION BRIDGING THERAPY

Completed form to be faxed to District Nurse

Patient name:.....

Address & Telephone no:.....

Dialysis Unit telephone no.....

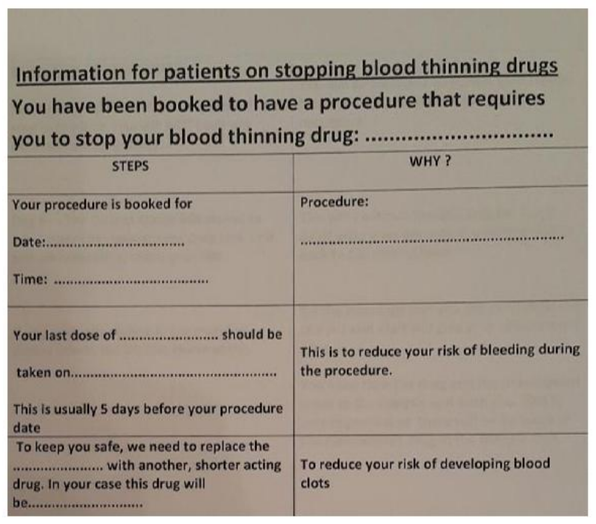
Days & Session times.....

Anti-coagulant: Reason:

Reason for stopping:

Discussed with Dr.....

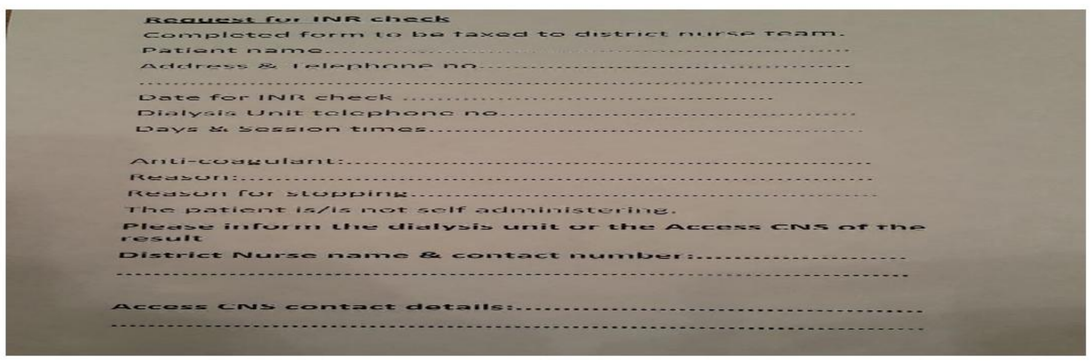
Patient has agreed/not agreed to self administer



Information for patients on stopping blood thinning drugs

You have been booked to have a procedure that requires you to stop your blood thinning drug: .....

STEPS	WHY ?
Your procedure is booked for Date:..... Time:	Procedure: .....
Your last dose of ..... should be taken on..... This is usually 5 days before your procedure date	This is to reduce your risk of bleeding during the procedure.
To keep you safe, we need to replace the ..... with another, shorter acting drug. In your case this drug will be.....	To reduce your risk of developing blood clots



Request for INR check
Completed form to be faxed to district nurse team.
Patient name.....
Address & Telephone no.....
.....
Date for INR check .....
Dialysis Unit telephone no.....
Days & Session times.....

Anti-coagulant:.....
Reason:.....
Reason for stopping.....
The patient is/is not self administering.
Please inform the dialysis unit or the Access CNS of the result
District Nurse name & contact number:.....
.....

Access CNS contact details:.....
.....

Third: LMWH (enoxaparin) prescribed at a therapeutic dose 1mg/kg/day to be given SC. SC route was selected as enoxaparin is dialyzable by HDF .Dialysis units informed to give the dose on Dialysis days while district nurses in the non dialysis days. Diabetic & PE patients self administered LMWH. Doses ranged between 60 -80 mg /day for of 6-8 days .No bleeding events or prolonged post dialysis bleeding recorded.

Fourth: Warfarin stopped 5 days before procedures,INR checked and therapeutic LMWH continued till the day before the procedure. INR rechecked the day before the procedure.

Fifth: No LMWH the morning of the procedure. In high risk patients prophylactic LMWH administered 8-12 hours after procedure. Warfarin started in the evening and therapeutic LMWH restarted the next morning .

Sixth : Stop LMWH when INR is therapeutic.The average number of days to complete bridging was eight days. We saved about eighty eight days of hospital bed occupancy.This enabled beds for other patients.This saved about £ 15,400 (provided that cost of bed per day is £175).

Conclusion

Bridgning can be implemented safely in outpatient cirumstances. It needs proper case selection with good risk evaluation and proper communication with all the health personnel involved in this patient care.

References

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(2) A Pint of Sweat Will Save a Gallon of Blood: A Call for Randomized Trials of Anticoagulation in End Stage Renal Disease . Granger C and Chertow G .Circulation . January 22, 2014

3)(Bridging Anticoagulation. Is it Needed When Warfarin Is Interrupted Around the Time of a Surgery or Procedure?.The BRIDGE Study Investigators. Circulation. 2012;125:e496-e498.)

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