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Letters

RESEARCH LETTER

Bridging Anticoagulation Before Colonoscopy: Results of a Multispecialty Clinician Survey

Long-term anticoagulant therapy is essential for stroke prevention among patients with atrial fibrillation, but increasing evidence also points to substantial risk for adverse events, especially when anticoagulation is temporarily interrupted.^{1,2} The recently published Effectiveness of Bridging Anticoagulation for Surgery Trial confirmed prior observational evidence that using short-acting anticoagulants periprocedurally increases bleeding risk without any reduction in stroke risk.³ Little is known about how medical specialists coordinate the complex decision of which patients to bridge. To investigate this question, we conducted a regional multispecialty, multi-center survey study regarding bridging practices.

Methods | Between July 29, 2015, and September 8, 2015, we surveyed all primary care physicians (PCPs), cardiologists, and gastroenterologists at the University of Michigan (primary site) and 4 other health care centers (secondary sites) participating in the Blue Cross Blue Shield of Michigan-sponsored Michigan Anticoagulation Quality Improvement Initiative.² Participants were excluded if they reported no involvement in patient care or bridging decisions. Clinicians were presented with 4 hypothetical vignettes of patients with atrial fibrillation who must temporarily discontinue warfarin for an upcoming colonoscopy (Table). The vignettes varied in number of stroke risk factors and were presented in random order to each partici-

pant to minimize assimilation effect bias.⁴ Clinicians were asked to indicate whether they would recommend bridging with low-molecular-weight heparin for each vignette. Clinicians were also asked about their current experience with periprocedural anticoagulation management, as well as who should be responsible for anticoagulation bridging decisions. Multivariable logistic regression models and Wald tests were used to assess adjusted response rate differences between clinician specialties. This study was deemed exempt by the institutional review board at the University of Michigan; consent was implied through participation in the optional survey.

Results | A total of 127 of 262 clinicians (48.5%) at the primary site and 80 of 496 clinicians (16.1%) at the secondary sites completed the survey. Respondents were well distributed across medical specialties and reported high levels of participation in bridging anticoagulation management (72.5% reported at least once per month). For intermediate-risk patients (CHADS₂ [congestive heart failure, hypertension, age ≥75 years, diabetes, prior stroke or transient ischemic attack] score = 3), there was significant variation in the recommendation to use bridging anticoagulation among specialties (Table). Notably, all specialties were more likely to recommend bridging for a patient with a CHADS₂ score of 3 if the patient had a prior ischemic stroke compared with a patient with equal risk but no prior ischemic stroke (73.9% vs 37.2%; *P* < .001).

There was wide consensus across specialties that a non-gastroenterologist should be responsible for making bridging decisions (197 of 207; 95.2%), with large numbers of respon-

Table. Survey Vignettes and Responses^a

Vignette	Stroke Risk Elements	Prior Ischemic Stroke	Site	Use of Bridging Anticoagulation, No. (%)			
				All Respondents (N = 207)	Cardiology (n = 54 [26.1%])	PCP (n = 121 [58.5%])	Gastroenterology (n = 32 [15.5%])
A 66-y-old man with AF and hypertension	CHADS ₂ = 1	No	Primary	7 (5.5)	1 (2.9)	5 (7.6)	2 (7.7)
	CHA ₂ DS ₂ -VASc = 2	No	Secondary	5 (6.3)	0 (0)	4 (7.3)	0 (0)
A 66-y-old man with AF, hypertension, diabetes, and congestive HF	CHADS ₂ = 3	No	Primary	45 (35.4)	7 (20.0)	28 (42.4) ^b	11 (42.3) ^b
	CHA ₂ DS ₂ -VASc = 4	No	Secondary	32 (40.0)	4 (21.1)	26 (47.3) ^b	1 (16.7)
A 66-y-old man with AF, hypertension, and a prior ischemic stroke	CHADS ₂ = 3	Yes	Primary	98 (77.2)	21 (60.0)	53 (80.3) ^b	21 (80.8) ^b
	CHA ₂ DS ₂ -VASc = 4	Yes	Secondary	55 (68.8)	10 (52.6)	42 (76.4) ^b	3 (50.0)
A 66-y-old man with AF, hypertension, diabetes, congestive HF, and a prior ischemic stroke	CHADS ₂ = 5	Yes	Primary	111 (87.4)	27 (77.1)	60 (90.9)	24 (92.3) ^b
	CHA ₂ DS ₂ -VASc = 6	Yes	Secondary	70 (87.5)	15 (78.9)	51 (93.0)	5 (83.3)

Abbreviations: AF, atrial fibrillation; CHADS₂, congestive heart failure, hypertension, age ≥75 years, diabetes, prior stroke or transient ischemic attack; CHA₂DS₂-VASc, congestive heart failure, hypertension, age ≥75 years (doubled), diabetes, stroke/transient ischemic attack/thromboembolism (doubled), vascular disease (prior myocardial infarction, peripheral artery disease, or aortic plaque), age 65 to 75 years, sex category (female); HF, heart failure; PCP, primary care physician.

^a All vignettes describe a warfarin-treated patient with AF who requires temporary interruption for an upcoming colonoscopy. Survey respondents are

asked to report when use of bridging with a short-acting anticoagulant (either heparin or low-molecular-weight heparin) would be recommended. Primary care physicians represent 52.0% and 68.8% of respondents at the primary and secondary sites, respectively. Presented survey responses are adjusted for clinician specialty, year of medical school graduation, self-reported mean number of patients seen per week, and self-reported mean number of periprocedural anticoagulation decisions made per month.

^b *P* < .05 as compared with cardiology.

dents believing that PCPs (51 of 207; 24.6%) or cardiologists (100 of 207; 48.3%) should be responsible. Notably, 32.2% of PCPs (39 of 121) felt uncomfortable managing periprocedural anticoagulation. Among PCPs, 81.8% (99 of 121) indicated that their institutions could do more to support perioperative anticoagulation and 87.6% (106 of 121) supported anticoagulation clinic management of this clinical situation.

Discussion | A high proportion of clinicians who frequently manage periprocedural anticoagulation continue to recommend bridging anticoagulation for intermediate-risk patients despite the recent publication of a high-quality randomized trial demonstrating net harm from this practice. Furthermore, there is little consensus about whether PCPs or cardiologists should be responsible for making the complex decision of whether to bridge or not. Our data suggest that this is especially important because the 2 groups have significantly different approaches to bridging, and a substantial proportion of PCPs reported being uncomfortable making bridging decisions. Prior work has highlighted use of bridging anticoagulation for up to 25% of warfarin-treated patients undergoing colonoscopy.^{5,6}

The results were consistent across a range of medical centers (academic and nonacademic). The generalizability of these findings, while limited by the few sites surveyed and the low response rate at the secondary sites, is bolstered by the potential bias for more informed clinicians to respond to a survey about anticoagulation management, for which they routinely make clinical decisions.

These results should encourage robust implementation efforts to standardize periprocedural anticoagulation management. Because periprocedural bridging is by nature complex and multidisciplinary, clinical leaders and policy makers need to assess the readiness of different specialists and support anticoagulation clinics to manage periprocedural anticoagulation.

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Concept and design: Barnes, Kurlander, Kaatz, Froehlich.

Acquisition, analysis, or interpretation of data: Barnes, Kurlander, Haymart, Saini, Froehlich.

Drafting of the manuscript: Barnes, Kurlander.

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A Quality Improvement Program for Recognition and Treatment of Inpatient ST-Segment Elevation Myocardial Infarctions

Rapid reperfusion with percutaneous coronary intervention or thrombolytic therapy is the standard of care for ST-segment elevation myocardial infarction (STEMI). STEMI that occur in hospitalized patients have delayed symptom recognition, longer times from electrocardiography (ECG) to first-device activation (FDA), lower rates of percutaneous coronary intervention, and higher mortality rates compared with outpatient STEMI.¹⁻⁶

We identified the barriers contributing to these delays and implemented a quality improvement program (QIP) to enhance the response to inpatient STEMI. Our QIP included the following 4 specific interventions: (1) a hospital-wide education campaign aimed at nurses, medical teams, and allied health care professionals on the recognition of inpatient STEMI and the importance of the timely reperfusion; (2) a requirement that ECG technicians and nurses immediately notify the cardiologist if the automated interpretation of an ECG included *****acute MI*****; (3) establishment of an inpatient STEMI protocol and a cardiac response team, modeled on the rapid response team; and (4) monthly review of each inpatient STEMI.