Canadian Medical Education Journal

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Anticoagulation management: an interdisciplinary curriculum for family medicine residents

Gestion des anticoagulants : une formation interdisciplinaire pour les résidents en médecine familiale

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Published ahead of issue: Jan 16, 2023. CMEJ 2023 Available at https://doi.org/10.36834/cmej.76200

Implication Statement

Anticoagulants are high-risk medications with the potential to cause significant patient harm if inappropriately managed. Medical trainees and practicing physicians often report inadequate education and uncertainty in decision-making related to anticoagulation therapy. To address this gap, an interdisciplinary Anticoagulation Management Training Program was developed for family medicine residents at the Toronto Western Family Health Team. Evaluation data demonstrated both improved knowledge and confidence in prescribing, monitoring, and adjusting anticoagulation therapy. This suggests that similar dedicated curricula be considered in other family medicine programs in order to optimize patient safety by enhancing the knowledge and self-efficacy of future practising physicians.

Énoncé des implications de la recherche

Les anticoagulants sont des médicaments à haut risque qui, mal gérés, peuvent causer des dommages importants aux patients. De nombreux étudiants en médecine et médecins en exercice déclarent que leur formation est inadéquate et qu'ils ont des doutes lorsqu'ils prescrivent un traitement anticoagulant. Pour combler cette lacune, une formation interdisciplinaire en gestion des anticoagulants a été élaborée pour les résidents en médecine familiale au sein de la Toronto Western Family Health Team. Les données d'évaluation de la formation indiquent une amélioration sur le plan des connaissances et de la confiance lors de la prescription, ainsi que sur celui du suivi et de l'ajustement de l'anticoagulothérapie. Ces résultats suggèrent qu'il serait donc pertinent d'envisager l'introduction de formations spécialisées de ce type dans les programmes de médecine familiale pour mieux assurer la sécurité des patients par le développement des connaissances et de l'auto-efficacité des futurs praticiens.

Introduction

Warfarin and other anticoagulants are high-risk medications[1] and have the potential to cause significant harm to patients if used inappropriately. Anticoagulants have been implicated in 14.9% of ED visits related to medication harm,[2] which is higher than all other classes of medications. Medical trainees and practising physicians report inadequate education and uncertainty in decision-making related to anticoagulation.[3] This is important as healthcare providers skilled in the assessment and adjustment of anticoagulation have been shown to positively impact patient outcomes.[4] In Canada, anticoagulation therapy is usually managed by family physicians. Although formalized anticoagulation training programs exist, we are not aware of any literature describing such training specifically for family medicine (FM) residents or physicians.

Description of innovation

A pharmacist-led Anticoagulation Management Training Program (AMTP) was developed and implemented at the University of Toronto Department of Family & Community Medicine, Toronto Western Family Health Team. The training program was designed based on current understanding of the importance of self-directed, experiential learning and utilized a collaborative,

interprofessional approach.[5,6] The training consists of two parts; 1) an electronic self-study manual called the Warfarin/Anticoagulation Virtual E-Training (WAVE) Manual and, 2) experiential training with a pharmacist for two half-days in clinic, managing patients on anticoagulation therapy. Treatment guidelines and resources developed by expert organizations and groups, including the American College of Chest Physicians (CHEST) and Thrombosis Canada were used to create the self-study content in the WAVE manual. Topics covered included: warfarin efficacy, safety, dosing, patient education and an overview and comparison of direct-acting anticoagulants to warfarin (Table 1).

Table 1. Description of content covered in the WAVE manual

Module	Topics Covered
1. Warfarin Basics	-Mechanism of action of warfarin and clotting factors affected -Defining INR and importance in monitoring warfarin -Common indications and INR targets for warfarin
2. Warfarin Efficacy	-Ability of warfarin to reduce risk for thromboembolic events -Assessing stroke risk in patients with atrial fibrillation -Clinical utility of CHADS2 and CHADS2VASc scores
3. Warfarin Safety	-Contraindications/precautions to warfarin use -Risk factors for bleeding -Clinical utility of the HASBLED score -Resources used to assess warfarin drug interactions and how to manage interactions -Review effects of vitamin K and alcohol on warfarin therapy
4. Warfarin Dosing	-Factors that affect warfarin sensitivity -Different dosing approaches to warfarin initiation (dosing nomograms) -How to adjust maintenance doses of warfarin including appropriate timing for INR measurements -Management of supratherapeutic INR results
5. Patient Counselling	-Key education points for patients initiating warfarin (including indication, target INR, major vs minor bleeding)
6. Antiplatelets and New Oral Anticoagulants	-Mechanism of action of antiplatelet agents and direct acting anticoagulants -Overview of the various direct acting anticoagulants including indication, efficacy, safety, coverage, and convenience -Advantages and disadvantages of the DOACS versus warfarin

Patient cases were presented with each module for application of knowledge. The program's objective was to support residents in acquiring the knowledge and confidence to effectively prescribe, monitor and adjust anticoagulation therapy.

Evaluation

A mixed method of evaluation was used with a pre- and post-training knowledge test and a survey to evaluate residents' confidence and satisfaction with the AMTP. Post-graduate year (PGY)-1 residents training at our site during the study period (April, 2018 – March, 2020) were recruited to participate. Approval was obtained from the University Health Network Institutional Review Board.

Eleven of eleven trainees completed the pre-training test and survey and six of eleven trainees completed the post-training test. Mean knowledge and skills test scores increased from 73.18% (±7.28) pre-training to 82.67% (±6.65) post-training. Confidence scores increased by an average of two points on a seven-point Likert scale following completion of the training. A statistical analysis was not completed due to the small sample size. All respondents indicated training with a pharmacist was an effective learning experience with a unanimous score of seven on the seven-point Likert scale.

Next steps

Though limited by small sample size, our cohort study demonstrates that FM residents are satisfied with a dedicated, pharmacist-led curriculum, that increased their knowledge and confidence in managing warfarin and other anticoagulants. Future directions will include longitudinal assessment to measure knowledge and skills retention and impact on patient outcomes. In the interim, a locally administered AMTP is a feasible educational intervention that other programs may consider to better prepare their trainees for future practice.

Conflicts of Interest: None
Funding: None

References

1. Institute for Safe Medication Practices (ISMP). *ISMP list of high-alert medications in community/ambulatory care settings.* ISMP; 2021. https://www.ismp.org/recommendations/high-alert-medications-community-ambulatory-list
2. Budnitz DS, Shehab N, Lovegrove MC, et al. US Emergency department visits attributed to medication harms, 2017-2019. *JAMA. 2021*; 326(13):1299-130. https://doi.org/10.1001/jama.2021.13844
3. Heidbuchel H, Berti D, Campos M, et al. Implementation of non-vitamin K antagonist oral anticoagulants in daily practice: the need for comprehensive education for professionals and patients. *Thrombosis.* 2015; 13:22. https://doi.org/10.1186/s12959-015-0046-0
4. Chamberlain MA, Sageser NA, Ruiz D. Comparison of anticoagulation clinic patient outcomes with outcomes from traditional care in a family medicine clinic. *J Am Board Fam Pract.* 2001;14:16–21. https://www.jabfm.org/content/jabfp/14/1/16.full.pdf
5. Greveson GC, Spencer JA. Self-directed learning–the importance of concepts and contexts. *Med Educ*. 2005;39(4):348–349. https://doi.org/10.1111/j.1365-2929.2005.02115.x
6. Yardley S, Teunissen PW, Dornan T. Experiential learning: transforming theory into practice. *Med Teach*. 2012;34(2):161-4. https://doi.org/10.3109/0142159X.2012.643264