Original Article

Negative Impact Of Self-Management And Overview Of Oral Anticoagulants

Walli Mohammed [1*], Dr. Hemant Kumar Sharma[2]

[1] Department of Pharmacy , Sri Satya Sai University of Technology and Medical Sciences, Sehore, Madhya Pradesh, India.
[2] Department of Pharmacy, Sri Satya Sai University of Technology and Medical Sciences, Sehore, Madhya Pradesh, India.
*Corresponding Author:
Walli Mohammed
Research Scholar
Department of Pharmacy
Sri Satya Sai University of Technology and Medical Sciences, Sehore, Madhya Pradesh, India
Mail id: wallimohammedcare@gmail.com
DOI: 10.47750/pnr.2021.12.S02.15

Abstract

Objective of study: To evaluate the impact on thrombotic events, major bleeding, and all-cause mortality of self-monitoring or self-treatment with oral anticoagulants compared with standard monitoring.
Methodology: For this review update, we re-ran the searches of the PubMed, Science Direct and google Scholar from 2000 to 2021. We checked bibliographies and referred the work of authors of relevant studies. We did not apply any language restrictions.
Discussion: Self-monitoring of anti-coagulation as its limited only to the patients who are capable of performing the required techniques and can bear the cost as well.
Conclusion: Thromboembolic events were reduced with self monitored anti coagulant treatment.

Keywords: Thromboembolic events | Anti-Coagulant| Self-Management Oral anti-coagulant.

Introduction and Background

Many patients are undergoing oral anticoagulation treatment with vitamin K antagonists, which necessitates measuring international normalized ratio (INR) several times each month. Point-of-care testing devices have allowed people on long-term oral anticoagulants to monitor their blood clotting time, as measured by the international normalized ratio (INR). Patients performing self-testing can adjust their medication dose according to a predefined dose INR pattern (self-administration) or call the clinic for advice on appropriate dose adjustment (self-monitoring). Several published studies and systematic reviews suggest that these methods of monitoring anticoagulant therapy may be equal to or better than the standard monitoring performed by physicians.

Oral anticoagulant therapy (OAT) with coumarin (vitamin K antagonist) is indicated for both prophylactic and therapeutic purposes in patients at high risk of thromboembolic events. OAT has a narrow therapeutic index and monitoring is based on classically determined International Normalized Ratio (INR) on citrate plasma obtained intravenously. Based on INR measurements, healthcare providers determine the appropriate dose of coumarin (e.g. warfarin (Marevan). Optimized OAT administration improves treatment quality of the patient (PSM) is a new concept in which the patient takes an active role in his or her own treatment. PSM in OAT involves the patient analyzing a single drop of blood using a portable coagulation meter (INR monitor). The coagulation meter displays the INR that the patient uses to measure the coumarin. It remains unclear which patient group (in terms of OAT indication, age, comorbidities, etc.) would potentially benefit from PSM or the extent of this effect. A prerequisite for accurate coumarin measurements is an accurate estimate of the INR, and the method and equipment used to provide the INR measurement are necessary in this context. The coagulation meter used for PSM has not been adequately studied for accuracy and consensus, so this is necessary. INR has been shown to be sufficient for dose adjustment. It is suspected that the INR level reflects the overall hemostasis or thrombosis capacity of each patient.

Continuous measurement and correction of auto thrombotic activity (CAT) and coagulation factor activities may serve as an overall and more sensitive hemostatic parameter and potentially good performance to predict the risk of complications in patients taking OAT.

Patients can learn how to measure INR at home and choose their own dose for the next stage, which can improve the quality of treatment and reduce healthcare costs. Heneghan CJ (2021) mentioned that self-management can improve the quality of oral anticoagulant therapy, leading to fewer thromboembolic events and lower mortality [Siebenhofer A (2014)], without a reduction in the number of major bleeds. As this process is not feasible for all patients, which requires the identification and education of suitable patients. However, this has to do with the underlying problem of losing tight external control over patient treatment.

Methodology- Selection criteria

Outcomes analysed were thromboembolic events, mortality, major and minor bleeding, test coverage, frequency of testing, and feasibility of self-monitoring and self-management.

For this review update, we re-ran the searches of the PubMed, ScienceDirect and Google Scholar from 2000 to 2021. We checked bibliographies and referred the work of authors of relevant studies. We did not apply any language restrictions.

Review of related Literature

Author with Year	Publisher	Title	Findings
Douketis, J. D. (2001).	American Journal of Cardiovascular Drugs, 1, 245-251.	Patient self-monitoring of oral anticoagulant therapy: potential benefits and implications for clinical practice.	The authors have pointed the advantages of anticoagulation self-monitoring as it reduces patient inconvenience relating to anticoagulation hospital visits and laboratory monitoring of warfarin therapy, and fewer INR levels outside the therapeutic INR range if INR measurements are preformed more often with anticoagulation self-monitoring. But at the same time, it has limitations too like costs of the portable coagulometer and patient's capability to perform the techniques required for it.
Garcia Alamino, J. M., Ward, A. M., Alonso Coello, P., Perera, R., Bankhead, C., Fitzmaurice, D., & Heneghan, C. J. (2010).	Cochrane Database of Systematic Reviews, (4).	Self-monitoring and self-management of oral anticoagulation	As compared to the standard monitoring, self-monitor or self-manage can improve the quality of patient's oral anticoagulation therapy. Even authors found a significant reduction in mortality.
Heneghan, C., Ward, A., & Perera, R. (2012).	Lancet, 379, 322-34.	Self-monitoring of oral anticoagulation: systematic review and meta-analysis of individual patient data.	They used individual patient data for assessment of self-monitoring for oral anticoagulation for their study. Broadly, they observed a significant reduction in thromboembolic events in the self-monitoring group. Yet, they didn't not find any significant effects for major haemorrhage or mortality.
Ansell, J. (2013).	Journal of thrombosis and	Point-of-care patient self-monitoring of oral	Patients who have self-monitored their therapy at home with a point-of-care INR monitor have shown an ability to achieve a

	thrombolysis, 35, 339-341.	vitamin K antagonist therapy.	high rate of TTR as documented in clinical trials.
Sharma, P., Scotland, G., Cruickshank, M., Tassie, E., Fraser, C., Burton, C., & Brazzelli, M. (2015).	Health technology assessment (Winchester, England), 19(48), 1.	The clinical effectiveness and cost-effectiveness of point-of-care tests (CoaguChek system, INRatio2 PT/INR monitor and ProTime Microcoagulation system) for the self-monitoring of the coagulation status of people receiving long-term vitamin K antagonist therapy, compared with standard UK practice: systematic review and economic evaluation.	The authors found significant reduction in thromboembolic events and mortality through self-management but not through self-testing. Self-monitoring seems to be safe and effective comparative to standard monitoring, especially for people with AHVs
Heneghan CJ, (2016)	https://pubmed.ncbi.nlm.nih.gov/27378324/	Self-monitoring and self-management of oral anticoagulation.	Both, trials of self-management or self-monitoring showed reductions in thromboembolic events (RR 0.47, 95% CI 0.31 to 0.70; participants = 3497; studies = 11) and (RR 0.69, 95% CI 0.49 to 0.97; participants = 4097; studies = 7), respectively;
Cayley Jr, W. E. (2017).	American FamilyPhysician, 95(11), 700-701.	Self-monitoring and self-management of oral anticoagulation.	Their conclusion is consistent with previous evidence, as well as with a 2012 meta-analysis of individual patient data from 11 studies that showed a significant reduction in thromboembolic events in the autologous group. Especially in young patients and those with thrombophilia machine problem. heart valve.
Menéndez-Jándula, B., García-Erce, J.A., Zazo, C. et al (2019)	BMC Cardiovasc Disord.	Long-term effectiveness and safety of self-management of oral anticoagulants in real-world settings	The authors found in their study period of 5 years that the PSM (Patient self-management) of OACs is effective for maintaining patients within the INR therapeutic range for a long period of time in routine clinical practice.
Corrochano, M., Jiménez, B., Millón, J., Gich, I., Rambla, M., Gil, E., & Souto, J. C. (2020).	BMC cardio-vascular disorders, 20(1), 1-13.	Patient self-management of oral anticoagulation with vitamin K antagonists in everyday practice: clinical outcomes in a single centre cohort after long-term follow-up	In terms of clinically related outcomes (incidence of major complications and mortality), PSM in practical setting seems to be a very good alternative in properly trained patients.

Khouja, C., Brunton, G., Richardson, M., Stokes, G., Blanchard, L., Burchett, H., & Thomas, J. (2021).	Systematic reviews, 11(1), 1-21.	Oral anticoagulants: a systematic overview of reviews on efficacy and safety, genotyping, self-monitoring, and stakeholder experiences.	Education, training to the patients and management can improve blood clotting control. Clinicians and patients consider efficacy and safety the most important factors in the management of AF and VTE.
Barnes, G. D., & Weyand, A. C. (2021).	Research and Practice in Thrombosis and Haemostasis, 7(2).	When technology improves patient care and provider experience.	Found a noteworthy work of authors for their innovative work that empowers patients and their families, reduces the work burden on the healthcare system, and demonstrates improved clinical management. They found that Warfarin PSM has been tested in several studies of adults, and noted that the participants under 18 years of age were eligible based on prior use and adherence to home INR self-testing.

Discussion:

As noted by the team of researchers, Heneghan et. al. (2012). Though their findings are very similar to those of previous systematic reviews, in which self-monitoring or self-management could improve the quality of patients of their oral-anticoagulation therapy. But despite the decrease in the number of thromboembolic events without concomitant increases in harms, there is no reduction in mortality shown in previous systematic reviews. Here we noted that Douketis, J. D. (2001) also highlighted the limitations of self-monitoring of anti-coagulation as its limited only to the patients who are capable of performing the required techniques and can bear the cost as well. Extending the conclusion of Douketis & J.D (2001) Garcia Alamino et. al. (2010) mentioned that the number of thromboembolic events and mortality were decreased without increases in harms. Yet, self-monitoring or self-management were not feasible for up to half of the patients requiring anticoagulant therapy due to the limitations discussed earlier. Similarly, Ansell, J. (2013) findings support the recommendations to implement home monitoring in those patients only who have shown competency in self-management strategies. Menéndez & other (2019) concluded in their observational study for a period of five years that the patients who continued the PSM reported effective results as all of the patients have been given the same type of portable coagulometer, which was able to store digitally up to 100 INR measurements. Effectiveness results comprised the percentage of patients within the therapeutic range, the time within therapeutic range (TTR). Citing the work of Cayley Jr, W. E. (2017), Corrochano, et. al. (2020). Khouja et. al. (2021) and Barnes et. al. (2021) self-managed anticoagulation showed improved thromboembolism and all-cause mortality.

Conclusion:

Although the safety of remote cardiovascular disease management is not superior to conventional outpatient anticoagulation, it does allow for more stable coagulation monitoring. Participants in self-monitoring or self-administration were able to improve the quality of their oral anticoagulant treatment. Thromboembolic events were reduced, both for those who self-monitored and those who treated themselves with oral anticoagulants. Reduced all-cause mortality was observed in self-administration trials but not in self-monitoring, with no effect on major bleeding. At present various available point of care devices and the most well-known is the CoaguChek® monitor. Other available monitors are the ProTime® Microcoagulation System, INRatio® Monitor, Hemochron Junior Signature, and the TAS near patient test system [Heneghan CJ (2016)]. Though it's not easy to achieve a good anticoagulation control even in specialized medical centres [Mueller S, et al (2014), and it's very necessary to look for the possible alternative which can improve self-management of anticoagulation and reduce healthcare overload

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