JGPEMN
ISSN 2091-279X
eISSN 2362-1168

ORIGINAL ARTICLE

Knowledge of warfarin among patients on warfarin therapy, using anticoagulant knowledge assessment tool, in Patan Hospital

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Date of submission: 15 Jul 2024

Date of acceptance: 27 Aug 2024

Date of Publication: 28 Aug 2024

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How to cite:
Das SK. Knowledge of warfarin among patients on warfarin therapy, using anticoagulant knowledge assessment tool, in Patan Hospital. J Gen Pract Emerg Med Nepal. 2024 Dec;11(18):38-42.

Online information
DOI:
https://doi.org/10.59284/jgpeman291

Abstract

Introduction: Warfarin is commonly used to prevent and treat cardiac, thromboembolic, and hypercoagulable conditions Despite its benefits, it was one of the top ten drugs with the most serious adverse events reported to the FDA during the 1990s and 2000s. Warfarin's narrow therapeutic window necessitates careful management to avoid bleeding from over-anticoagulation or thrombosis from under-anticoagulation. Various tools exist to assess patient knowledge of warfarin, including the validated Anticoagulation Knowledge Assessment (AKA) questionnaire. This study uses the AKA tool to evaluate warfarin knowledge among patients at Patan Hospital, Lalitpur, Nepal.

Method: It was a single center, cross-sectional study done among 85 patients. Study was done for one year from Nov 2020 to Oct 2021. Convenient sampling was employed. The Anticoagulation Knowledge Assessment (AKA) questionnaire was translated into Nepali, modified for local relevance, and validated. Adequate knowledge was defined as correctly answering at least 70% of the questions.

Result: The study included 85 participants, 54 (63.5%) male and 31 (36.5%) female, with a mean age of 40.5 years (range: 16-91 years). Majority of participants attended primary level education 27 (31.8%). Only 17.6% of participants demonstrated adequate knowledge of warfarin, with a higher proportion of males (12) than females (3). Adequate knowledge was significantly associated with education level, but not with sex or age.

Conclusion: The analysis revealed that 17.6% of patients had adequate knowledge of warfarin. Education level showed a significant association with knowledge, with a p-value of 0.002.

Keywords: Anti Coagulation Knowledge Assessment Tool, Adequacy of Knowledge, Education on warfarin, knowledge, Patan Hospital

INTRODUCTION

Warfarin is commonly used to prevent and treat cardiac, thromboembolic, and hypercoagulable diseases, and due to its high inter-individual variability, its anticoagulant activity must be monitored using the international normalized ratio (INR) to ensure a safe and effective dose.[1] Patients' knowledge on warfarin can improve anticoagulation control with decrease in adverse drug reaction and other associated complications.[2] It is common cause of adverse drugs event in emergency room and overall risk of major bleeding average of 7-8% per year.[3] In a study done at Gangalal hospital, Kathmandu, on warfarin knowledge assessment using AKA tool, of the 34 patients enrolled, only 5.8% achieved a passing score i.e > 70 % whereas 94.1% failed to achieve the passing score.[1]

Acute and occult bleeding during warfarin therapy is a major challenge in millions of patient receiving warfarin therapy worldwide, frequency of severe bleeding episode (intracranial hemorrhage, gastrointestinal bleed, hematemesis, intraocular bleeding, hemarthrosis) ranges from 2% to 13%.[4] Apart of bleeding, warfarin causes anticoagulation related nephropathy, hypotension from systemic bleeding, and also promote vascular calcification owing to inhibition of matrix G1a protein.[5] Adverse effects of warfarin are nausea, vomiting, abdominal pain, bloating, flatulence , altered taste, and rarely purple toe syndrome.[6] Patient prefer warfarin over modern anticoagulants as it is inexpensive, but carries life threatening complication.[7]

Factors including regular PT/INR monitoring, knowledge about warfarin and its interaction, recognition of danger sign, and other factors including the nature of behaviors should be considered while assessing patients' adherence and knowledge of warfarin therapy.[8] Patients' knowledge of warfarin is direct determinant of anticoagulation control therefore attention should be given to education.[9] A formal inpatient warfarin related education program may better improve compliance and increase long term control of PT/INR.[10]

There are different tools and mean to access knowledge of warfarin among patient like validated Anticoagulation Knowledge Assessment (AKA) questionnaire, oral anticoagulation knowledge (OAK) test , knowledge attitude and practice towards warfarin questionnaire, pre and post pamphlet pre test and post test. Among different tool to access, knowledge of patient on warfarin anti-coagulant knowledge assessment tool has been chosen as it cover multiple aspect of drugs. The final version of AKA tool contains 29 items located at different levels of difficulty that allowed differences in patient knowledge about the anticoagulation care patients receive to be evaluated which assess "medication information/administration" and "side effects".[11] This study is being conducted as there are very few studies on the topic and not been done in Patan hospital. Accessing level of knowledge and establishing its association will help doctors to focus on the different domains of patient counseling.

METHOD

The study's general objective is to assess the knowledge level of patients on warfarin therapy using the Anticoagulant Knowledge Assessment (AKA) tool. Specifically, it aims to explore the associations between knowledge levels and gender, different age groups, and various educational levels among these patients. Study was conducted as a single center cross-sectional study at Patan Hospital, Nepal. It included patients who understood English or Nepali. The study was done after receiving ethical clearance from IRC Patan hospital (Ref: PMG2102261484). Informed and written consent were obtained. Data were collected from both inpatients and outpatients over one year ((Nov 2020 to Oct 2021)) through face-to-face interviews and structured questionnaires. Sample size of 85 was achieved using following calculation.

Size is calculated using equation

$$n=(Z^2)*P*(1-P)/d^2$$

Where Z = 1.96 at 95% confidence; p = prevalence of patient taking warfarin, q = 1-p; d = absolute allowable error. Prevalence (%) = 94.12[1] , Z=1.96, q=0.6, d=0.05 (as taken 5% error)

n = (1.96 x 1.96 x 0.941 x 0.059) / (0.05 x0.05)

n = 85.22 = 85

The AKA tool, adapted for local context and validated in Nepali and English, deemed a score of 13 out of 18 correct answers as indicative of adequate knowledge. The study included patients taking warfarin who could understand English or Nepali, either written or verbal. It excluded patients unwilling to give consent or those unable to understand either language. Data were analyzed using Epi Info 7.2.2, with statistical tests including chi-square for association

RESULT

Eighty-five participants were included in this study. Out of those 54 (63.5 %) were male and 31(36.5%) were female (Table 1). Mean age of the study population was 40.5 ±19.1 years, with the youngest being 16 year and eldest being 91 years. Among the participants, 25 (29.4%) were not educated, 20(23.5%) were educated until primary level, 27(31.8%) were educated until secondary level and 13(15.3%) were educated up to bachelor and above. Approximately 15(17.%) population had adequate knowledge on warfarin based on the modified AKA tool, among which 12 were male and 3 were female.

Table 1. Sociodemographic characteristics of respondents

Characteristics	Category	*f* (%)	Remarks
Sex	Male	54(63.5%)	M : F = 1.74
	Female	31(36.5%)	
Age	Less than 20	8(9.4%)	(median age = 37 years)
	20 -< 30	25(29.4%)	
	30 - <40	16(18.8%)	
	40- <50	14(16.5%)	
	50- <60	7(8.2%)	
	60- <70	8(9.4%)	
	70- <80	5(5.9%)	
	More than 80	2(2.4%)	
Education	Not educated	25(29.4%)	
	Primary School	20(23.5%)	
	Secondary School	27(31.8%)	
	Bachelor and above	13(15.3%)	

DISCUSSION

In this study, we found that 15(17.6%) patient had adequate knowledge about warfarin using anti-coagulant knowledge assessment tool among 85 total patient (Table 2). In a study conducted in VA Tennessee valley healthcare (USA) in 2009, 74.1% (137 among 185) of participant had adequate knowledge about warfarin using AKA tool.[12] In a 2018 study by Xingang, et al., in mainland China, only 9.2% of patients had adequate knowledge of warfarin, with a mean age of 67.4 years, 53.8% being female, and varying educational levels, though the questionnaire language was not specified.[2]

In another study conducted at Shahid Gangalal National Heart center, done by Shrestha S, et al., Sept. 10 2014,

Table 2. Adequacy of knowledge based on their sociodemographic characteristics

Characteristics	Category	Frequency of adequacy of knowledge	Frequency of not having adequate knowledge	Pearson Chi square value	p-value *(< 0.05 significant)*
Sex	Male	12	42	2.133	0.144
	Female	3	28		
Age	Less than 20	1	7	9.845	0.198
	20 -< 30	8	17		
	30 - <40	2	14		
	40- <50	4	10		
	50- <60	0	7		
	60- <70	0	8		
	70- <80	0	5		
	More than 80	0	2		
Education	Not educated	0	25	**14.705**	**0.002**
	Primary School	2	18		
	Secondary School	7	20		
	Bachelor and above	6	7		

of the 34 patients only 2 (5.8%) achieved a passing score whereas 32(94.1%) failed to achieve the passing score. In the same study, there were 19(55.8%) male and 15(44.1%) were female.[1] There was no mention of translation of language in study conducted at Shahid Gangalal National heart center. With comparison to study done at Shahid Gangalal, adequate knowledge was seen in 17.6% of patient which is higher than 5.8%, as we had omitted some of the questionnaire and translated it into the native Nepali language.

In our study, there was no association between levels of knowledge using anticoagulant assessment tool and different sex i.e. p value = 0.144 (Pearson Chi square value 2.133) among male and female. There were 54 male among which 12 had adequate knowledge and 31 were female among which 3 had adequate knowledge. A similar study by Pourafkari, et al., in Buffalo, NY, March 2018, found no association between sex and warfarin knowledge among 79 men and 71 women.[13] Also in study conducted in Shrestha, et al., Sept 2015, showed no association between knowledge and different sex.[1]

Similarly, there was no association between levels of knowledge using anticoagulant assessment tool and age i.e p value = 0.198 (Pearson chi square value 9.845). In the study done by Shrestha et al sept 2015, there was no association between knowledge and age.[1]

Likewise in our study we found that there was association between knowledge and education i.e. p value = 0.002 (Pearson chi square value = 14.705). Similarly, there were no association between different education group and adequacy of knowledge i.e. p values = 0.238 (Pearson chi square = 8.0), however, it was not the objective of our study. Buffalo NY by Pourafkari, et al., March 2018 showed education had association with AKA score (P= 0.001).[13] Similarly, in a study conducted in mainland China, by Xingang, et al., 2018, there was significant association between AKA score and education level (p=0.006).[2]

Knowledge of warfarin directly impacts drug compliance and PT/INR control, with studies showing that education and post-discharge counseling significantly improve patient knowledge.[14] Similarly, it has also been seen that patient seems to have better education with passage of

time of warfarin therapy.[1] It may require integrated and multidisciplinary education programs to improve patients knowledge and compliance of warfarin.[15] Role of primary care physician has also been enlightened in patients outcome of warfarin knowledge.[16] Tool to access knowledge on warfarin itself can also be used as reference for structuring health education activities to ensure the individualization of educational intervention in patients on warfarin.[17] It has also been encouraged to counsel care provider at home for older patient.[18]

As per result of this study, AKA tool can be used for accessing knowledge of patients on warfarin therapy. Knowledge is associated with education but not with sex and age. Hence, one's education is very important for drug knowledge, which can help in better compliance. Similarly AKA tool can be used to access effectiveness of health care worker in dispensing medicine, which can be further explored in the future studies. As per my study, it can be recommended to use AKA tool routinely to access adequacy of patient knowledge on warfarin therapy.

AKA tool consist of 29 questionnaire, where as we used only 18 questions for the questionnaire for the study, and the questionnaire was translated into Nepali. Translated Nepali questionnaire was face validated. Hence validity of study done in subset questionnaire of actual AKA tool can be explored in future studies. Likewise this study was conducted in single center in limited population, future study in larger population with questionnaire in Nepali with local preferences can be addressed.

CONCLUSION

The analysis revealed that 17.6% of patients had adequate knowledge of warfarin. There was no significant difference in knowledge based on sex or age, as indicated by non-significant p-values (0.144 for sex and 0.198 for age). However, education level showed a significant association with knowledge, with a p-value of 0.002. This highlights that education is a key factor in understanding warfarin, as patients with lower education levels had less knowledge. The findings emphasize the need for targeted educational interventions to improve warfarin knowledge, particularly for those with lower educational attainment, to enhance patient compliance and management.

DECLARATIONS

Acknowledgement

Special acknowledgment to my teachers who helped me during the study.

Conflict of Interest

None

Funding

None

Ethical Clearance

It was obtained from IRC PAHS (Ref: PMG2102261484)

Consent for Study

Informed and written consent was obtained from each participants.

Consent for Publication

I consent for publication as there are no other authors.

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