Knowledge and Compliance of Oral Anticoagulation Therapy at Warfarin Clinic in Kathmandu: A Cross-sectional Study

Roji Shakya[1,2], Muna Maharjan[3], Sabita Karki[4], Takma K.C.[5]

[1]Nursing Supervisor, Shahid Gangalal National Heart Centre, Kathmandu, Nepal
[2]Nursing Campus Maharajgunj, Institute of Medicine, Tribhuwan University, Kathmandu, Nepal
[3]Assistant Professor, School of Nursing and Midwifery, Karnali Academy of Health Sciences, Jumla, Nepal
[4]Assistant Professor, Bir Hospital Nursing Campus, National Academy of Health Sciences, Kathmandu, Nepal
[5]Professor, Nursing Campus Maharajgunj, Institute of Medicine, Tribhuwan University, Kathmandu, Nepal

Corresponding Author:
Ms. Roji Shakya; email: rosyroje@yahoo.com; ORCID: https://orcid.org/0000-0002-4308-7949

ABSTRACT

Introduction: Warfarin is the most widely used anticoagulant drug worldwide due to its low cost and ease of use. Adequate knowledge and compliance to oral anticoagulation therapy are essential measures that decrease morbidity and mortality among cardiac patients. This study aimed to assess the level of knowledge and compliance regarding oral anticoagulation therapy among patients with a mechanical heart valve.

Methods: A cross-sectional study was carried out among patients with mechanical heart valves on warfarin at Shahid Gangalal National Heart Centre of Kathmandu, Nepal. Participants were selected through a systematic random sampling technique, and a face-to-face interview was conducted. Knowledge was assessed using validated oral anticoagulation knowledge questionnaires composed of 20 multiple-choice questions. Compliance was assessed using 8 items Morisky Medication Adherence Scale. The descriptive and bivariate analysis were carried out using the Statistical Package for the Social Sciences version 16.

Results: A total of 222 patients were included in this study. Only 35 (15.8%) had good knowledge, and 93 (41.9%) had high compliance to oral anticoagulation therapy. The mean adherence score was 1.81 ± 0.78. Age, literacy, and educational level of the patients were statistically significant with knowledge. The compliance was significantly related only with a duration of warfarin use (p=0.003).

Conclusion: The patients had a moderate level of knowledge on warfarin therapy. However, they had good compliance with oral anticoagulation therapy. Based on the findings, education awareness program is recommended to improve the patient's knowledge on oral anticoagulants.

Keywords: Anticoagulant, knowledge, Nepal, patient compliance, warfarin.

INTRODUCTION

Worldwide, Rheumatic Heart Disease (RHD) affected more than 15 million people contributing 282,000 new cases and resulting in 233,000 deaths every year.[1] Globally, the number of patients requiring heart valve replacement estimated triple by 2050, from over 290,000 in 2003 to more than 850,000.[2] In Nepal, RHD is a public health problem that primarily affects children and adolescents. Many young people have died due to severe valvular heart diseases while waiting for valve replacement surgeries in the past.[3]

Shahid Gangalal National Heart Centre is the national referral center for cardiac cases, valve replacement surgery is the second most common open-heart surgery

performed in this center, accounting for 34% of all heart surgeries.[4] The clinical effectiveness of heart valve replacements in extending life expectancy and improving quality of life has long been established.

Patients having mechanical valve prostheses must be treated with oral anticoagulants to lower the risk of thromboembolic events.[5] Warfarin is the recommended oral anticoagulant drug when prolonged anticoagulation is required.[6] However, it is associated with several side effects and bleeding is most serious among them.[7] Thus, monitoring the International Normalized Ratio (INR) of patients using warfarin becomes critical to strike a balance between the drug's anticoagulation efficacy and the risk of bleeding problems.[8] Bleeding complications were associ-

ated with a lack of awareness about anticoagulants.[9] Warfarin-related knowledge and self-efficacy have a substantial impact on drug adherence.[10] Adequate compliance has been associated with anticoagulation control.[11]

Knowledge of warfarin, potential side effects, interfering medicines and foods, and the need for warfarin adherence, all play a part in attaining the desired therapeutic outcome while preventing the adverse reaction.[12] According to a study conducted among Saudi Arabian patients, 14.9% of patients had adequate knowledge about oral anticoagulants, while 35.9% had adherence to oral anticoagulants.[13] Only 13.9% of patients in Ethiopia had an appropriate understanding of warfarin therapy.[14] These suggested knowledge and adherence regarding anticoagulant therapy is inadequate.

There is limited data regarding the knowledge of warfarin use and its compliance among patients with mechanical heart valve replacement in Nepal. Hence, this study was conducted with the aim to determine the level of knowledge and compliance related to oral anticoagulation therapy among patients attending a warfarin clinic in Kathmandu.

MATERIALS AND METHODS

A cross-sectional study was conducted at Shahid Gangalal National Heart Centre (SGNHC) in Kathmandu. This study was approved by the Research Committee of Maharajgunj Nursing Campus and the Institutional Review Board of the Institute of Medicine [Ref. No: 241 (6-11-E)]. Written permission was obtained from the Institutional Review Board of SGNHC. The purpose of the study was explained to participants on oral anticoagulation therapy and informed written consent was signed. The data were collected through face-to-face interview from the period February to March 28, 2016.

The sample size was calculated by Cochran's correction formula[15] taking the prevalence of good knowledge of oral anticoagulation therapy 55%.[16] The calculated sample size was 222 at 95% confidence interval and 5% allowable error. The systematic random sampling technique was used to select the desired sample size. Desire sample size was 222 and total sampling population was 520. Sampling interval was 520/222=2.34 that is 2. So researcher enroll every 2nd client as sample. For the 1st sample, simple random sampling was done by lottery method from 1 and 2. By lottery method, number 2 got selected so 1st sample taken was 2nd client of the day.
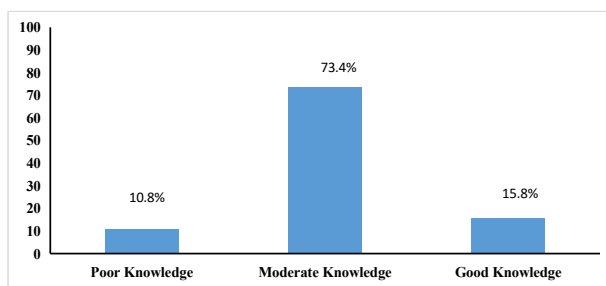
The collected data were entered into Microsoft Excel and transferred to SPSS version 16. The association between the variables was determined by applying the Chi-square test. Knowledge was assessed using 20 items standard and validated questionnaire related to oral anticoagulation knowledge (OAK) test.[17] The scores of knowledge were categorized as poor knowledge obtaining less than or equal to 8 points (0-40%), moderate knowledge scoring 9 to 14 points (41-70%) and good knowledge obtaining points more than or equals to15 (>75%).[18] The passing score was defined as obtaining at least 75% (15 correct responses) out of 20 OAK questionnaires. Compliance related to oral anticoagulants was assessed by using the 8-item Morisky Medication Adherence Scale (MMAS-8).[19] The score of compliance was categorized as high compliance obtaining score 0, moderate compliance obtaining score between 1-2, and low compliance

obtaining score between 3-8. The instrument was translated into the Nepali language and then was re-translated back to English to retain the same concept of the questionnaire. Pre-testing of the instrument was done among 22 patients at SGNHC and they were excluded from final analysis. The reliability of the instrument was assessed by the split-half method and the reliability value was 0.76.
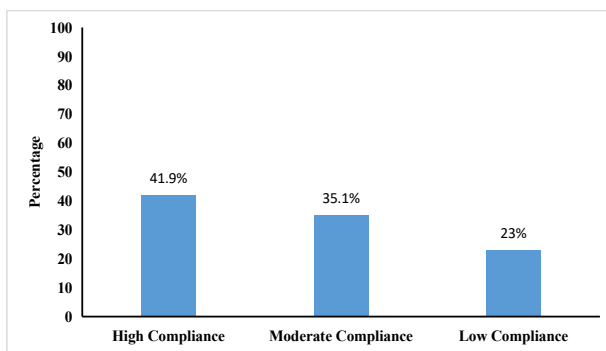
RESULTS

A total of 222 patients were enrolled in this study. Table 1 reveals 66 (29.7%) of patients were between the age group 25-35 years. The mean age of patients on oral anticoagulation therapy was 36.47□13.08 years. Among the patients on oral anticoagulation therapy 135 (60.8%) were literate, 164 (73.9%) were married staying with spouse and 84 (37.8%) patients were having duration of warfarin use for more than 5 years (Table 1).

Figure 1 depicts only 35 (15.8%) of the patients had good knowledge on oral anticoagulation therapy while 163 (73.4%) had moderate knowledge and 24 (10.8%) with poor knowledge (Figure 1).

Figure 1: Patient's level of knowledge on oral anticoagulation therapy

Figure 2 shows that 93 (41.9%) of the patients on oral anticoagulation therapy had high medication compliance, whereas 78 (35.1%) had moderate compliance and 51 (23.0%) had low compliance (Figure 2).

Figure 2. Patient's level of compliance on oral anticoagulation therapy

Table 2 shows that there was a significant association between age (p= 0.008), education (p= 0.000) and educational level (p= 0.042) with the knowledge of patients on oral anticoagulation therapy (Table 2).

Table 3 displayed the significant association between duration of warfarin use (p=0.003) and compliance of patients on oral anticoagulation therapy (Table 3).

Table 1. Socio-demographic characteristics on oral anticoagulation therapy

Socio-demographic Characteristics		Number	Percentage
Age (Years)	< 25	49	22.1
Mean +SD 36.47+13.08	25-35	66	29.7
	36-45	57	25.7
	46-55	28	12.6
	>55	22	9.9
Sex	Male	88	39.6
	Female	134	60.4
Education	Literate	135	60.8
	Illiterate	87	39.2
Educational Level	Informal education	9	4.1
	Primary Level	8	3.6
	Secondary Level	20	9.0
	Higher Secondary Level	58	26.1
	Bachelor Level and Above	40	18
Marital Status	Unmarried	50	22.5
	Married staying with spouse	164	73.9
	Married but separated	2	0.9
	Widow	6	2.7
Duration of warfarin use	< 2 years	61	27.5
	2-5 years	77	34.7
	>5 years	84	37.8

Table 2. Association between socio-demographics and knowledge on oral anticoagulation therapy.

Characteristics	Total	Good Knowledge	Moderate Knowledge n (%)	Poor Knowledge n (%)	p value
Age					
< 35	115	23 (20.0)	86 (74.8)	6 (5.2)	0.008*
> 36	107	12 (11.2)	77 (72.0)	18 (16.8)	
Sex					
Male	88	16 (18.2)	64 (72.7)	8 (9.1)	0.622
Female	134	19 (14.2)	99 (73.9)	16 (11.9)	
Literacy					
Literate	135	31 (23.0)	97 (71.9)	7 (5.2)	0.000*
Illiterate	87	4 (4.6)	66 (75.9)	17 (19.5)	
Educational Level (n=135)					
Up to secondary level	37	4 (10.8)	29 (78.4)	4 (10.8)	0.042*
Higher secondary and above	98	26 (26.5)	69 (70.4)	3 (3.1)	
Marital Status					
Unmarried	50	7 (14.0)	41 (82.0)	2 (4.0)	0.170
Married	172	28 (16.3)	122 (70.9)	22 (12.8)	
Duration of Warfarin Use					
Up to 2 years	61	10 (16.4)	46 (75.4)	5 (8.2)	0.742
> 2 years	161	25 (15.5)	117 (72.7)	19 (11.8)	
*p significant at < 0.05 level of significance; chi square test					

DISCUSSION

This study aimed to assess the level of knowledge and compliance to oral anticoagulation therapy among patients attending a warfarin clinic in Kathmandu. This study identified the good knowledge score was obtained by a smaller number (15.8%) of patients. It is similar to the findings from the study conducted in Saudi Arabia with 14.9% of the patients had adequate knowledge of oral anticoagulation therapy.[13] The finding is aligned with another study conducted in Ethiopia where 13.9% of patients had

Table 3. Association between socio-demographics and compliance on oral anticoagulation therapy.

Characteristics	Total	High Compliance	Moderate Compliance n (%)	Low Compliance n (%)	p-value
Sex					
Male	88	33 (37.5)	34 (38.6)	21 (23.9)	0.541
Female	134	60 (44.8)	44 (32.8)	30 (22.4)	
Education					
Literate	135	53 (39.3)	48 (35.6)	34 (25.2)	0.517
Illiterate	87	40 (46.0)	30 (34.5)	17 (19.5)	
Educational Level (n=135)					
Up to secondary level	3	16 (43.82)	13 (35.1)	8 (21.6)	0.792
Higher secondary and above	9	37 (37.8)	35 (35.7)	26 (26.5)	
Marital Status					
Unmarried	50	20 (40.0)	18 (36.0)	12 (24.0)	0.952
Married	172	73 (42.4)	60 (34.9)	39 (22.7)	
Duration of Warfarin Use					
Up to 2 years	61	36 (59.0)	18 (29.5)	7 (11.5)	0.003*
>2 years	161	57 (35.4)	60 (37.3)	44 (27.3)	
*p significant at < 0.05 level of significance; chi square test					

good appropriate knowledge of warfarin therapy.[19] Similarly, in another study, only 11.2% of patients achieved a passing score.[20] On the contrary, a study done in Veterans revealed as much as about three-fourths (74.1%) achieved the passing score.[21] This finding suggest that there is need of awareness regarding the use of anticoagulant for patients using it.

Oral anticoagulant compliance was achieved among nearly half of the patients in this study. This finding is similar to the study conducted in Saudi Arabia that showed high medication compliance in 46.4% of the patients receiving oral anticoagulants.[22] Similarly, another study identified that about 36% of patients reported good medication compliance.[13] The higher compliance might be because they were instructed clearly to use the drug and might be afraid of further complications to be happen if not using the medicine.

This study showed a significant association between age, literacy status, educational level, and knowledge of warfarin therapy. This result is consistent with the study conducted in Malaysia, where age was associated with the patient's knowledge of warfarin therapy.[12] However, another study reported no association between the patient's age and the knowledge of warfarin therapy.[23] There was no association between marital status and their knowledge level in the present study. It is similar to the study conducted in Saudi Arabia.[22] Likewise, in the present study there is no association between the duration of warfarin use and the level of knowledge. Though, the findings presented by Tang reported a positive association between the duration of warfarin use and the knowledge level of the patients.[24]

The present study has also identified the association between the duration of warfarin use and compliance to the therapy. It might be due to sticking to the advice of their treating physician irrespective to their level of knowledge. Based on the literature, the use of warfarin booklet and information from the physician or health care professionals would be helpful in improving the knowledge and compliance to oral anticoagulation therapy among the patients.

Limitation: It was a single centric study, so the findings might not be generalized to the whole population. Further studies are recommended with the educational intervention programs to improve the knowledge and compliance of warfarin among patients. This study limits the identification of previous education programs on oral anticoagulation therapy in Nepal.

CONCLUSION

The patients had a moderate level of knowledge of warfarin therapy. However, they had good compliance with medication. Based on the findings that education intervention program is recommended to improve the patients' knowledge about oral anticoagulants. This study findings might be helpful for the hospitals in planning and implementing the educational programs on oral anticoagulation therapy.

REFERENCES

1. Carapetis JR, Steer AC, Mulholland EK, Weber M. The global burden of group A streptococcal diseases. Lancet Infect Dis. 2005 Nov;5(11):685–94. https://doi.org/10.1016/S1473-3099(05)70267-X [PubMed] [Full Text]

2. Yacoub MH, Takkenberg JJM. Will heart valve tissue engineering change the world? Nat Clin Pract Cardiovasc Med. 2005 Feb;2(2):60–1. https://doi.org/10.1038/ncpcardio0112 [PubMed]

3. Regmi PR, Wyber R. Prevention of rheumatic fever and heart disease: Nepalese experience. Glob Heart. 2013;8(3):247–52. https://doi.org/10.1016/j.gheart.2013.08.001 [Full Text]

4. Shahid Gangalal National Heart Centre. Shahid Gangalal National Heart Centre. 2014. Available from: https://sgnhc.org.np/downloads [Full Text]

5. Sharaf AY, Ibrahim AFAE-F, Elhamami M. Knowledge and Adherence to Oral Anticoagulant Therapy among Patients with Mechanical Heart Valve Prosthesis. IOSR J Nurs Heal Sci. 2017 May;06(03):19–29. https://doi.org/10.9790/1959-0603021929 [Full Text]

6. Shrestha S, Sapkota B, Kumpakha A, Acharya U, Sharma R. Evaluation of patients' knowledge on warfarin in outpatient pharmacy of a tertiary care cardiac center. BMC Res Notes. 2015 Dec 10;8(1):429. https://doi.org/10.1186/s13104-015-1416-1 [PubMed] [Full Text]

7. Hasan SS, Shamala R, Syed IA, Basariah N, Chong DWK, Mei TK, et al. Factors affecting warfarin-related knowledge and INR control of patients attending physician- and pharmacist-managed anticoagulation clinics. J Pharm Pract. 2011;24(5):485–93. https://doi.org/10.1177/0897190011415684 [PubMed]

8. Khudair IF, Hanssens YI. Evaluation of patients' knowledge on warfarin in outpatient anticoagulation clinics in a teaching hospital in Qatar. Saudi Med J. 2010 Jun 1;31(6):672–7. https://doi.org/10.1001/archinte.164.18.2044. [PubMed]

9. Kagansky N, Knobler H, Rimon E, Ozer Z, Levy S. Safety of anticoagulation therapy in well-informed older patients. Arch Intern Med. 2004 Oct 11;164(18):2044–50. https://doi.org/10.1001/archinte.164.18.2044 [PubMed]

10. Kim JH, Kim GS, Kim EJ, Park S, Chung N, Chu SH. Factors affecting medication adherence and anticoagulation control in Korean patients taking warfarin. J Cardiovasc Nurs. 2011 Nov;26(6):466–74. https://doi.org/10.1097/JCN.0b013e31820914e7 [PubMed]

11. Ewen S, Rettig-Ewen V, Mahfoud F, Böhm M, Laufs U. Drug adherence in patients taking oral anticoagulation therapy. Clin Res Cardiol. 2014 Mar 3;103(3):173–82. https://doi.org/10.1007/s00392-013-0616-8 [PubMed]

12. Yahaya AHM, Hassali MA, Shafie AA. Factors Associated with Warfarin Therapy Knowledge and Anticoagulation Control among Patients Attending a Warfarin Clinic in Malaysia. J Clin Diagnostic Res. 2009;3:1663–70. Available from: https://www.researchgate.net/profile/Abdul-Haniff-Mohamad-Yahaya/publication/279762564_Factors_associated_with_warfarin_therapy_knowledge_and_anticoagulation_control_among_patients_attending_a_warfarin_clinic_in_Malaysia/links/5d7860e892851cacdb30d6bc/Fac. [Full Text]

13. Elbur AI, Albarraq AA, Maugrabi MM, Alharthi SA. Knowledge of, Satisfaction with and Adherence to Oral Anticoagulant Drugs among Patients in King Fasial Hospital; Taif, Kingdom Saudi Arabia. Int J Pharm Sci Rev Res. 2015;31(1):274–80. [Full Text]

14. Yabeyu AB, Ayanaw MA, Haile KT, Kifle ZD. Evaluation of patients' knowledge of warfarin at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia. Metab Open. 2022;13(December 2021):100155. https://doi.org/10.1016/j.metop.2021.100155 [Full Text]

15. Cochran W. Sampling Technique. 3rd ed. John Wiley & Sons; 1977. Available from: http://hbanaszak.mjr.uw.edu.pl/StatRozw/Books/Cochran_1977_Sampling Techniques.pdf.[Full Text]

16. Sayeed N, Judy M, Beata B. Challenges of older patients' knowledge about warfarin therapy. J Prim Care Community Health. 2012;3(1):65–74. https://doi.org/10.1177/2150131911416365 [PubMed]

17. Zeolla MM, Brodeur MR, Dominelli A, Haines ST, Allie ND. Development and validation of an instrument to determine patient knowledge: the oral anticoagulation knowledge test. Ann Pharmacother. 2006 Apr 1;40(4):633–8. https://doi.org/10.1345/aph.1G562 [PubMed]

18. Assefa T, Gedif T, Alemayehu B. Evaluation of Patients' Knowledge on Warfarin Therapy Among Outpatients Receiving Warfarin at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia. Ethiop Pharm J. 2014;30:133–8.

19. de Oliveira-Filho AD, Morisky DE, Neves SJF, Costa FA, De Lyra DP. The 8-item Morisky Medication Adherence Scale: Validation of a Brazilian-Portuguese version in hypertensive adults. Res Soc Adm Pharm . 2014;10(3):554–61. https://doi.org/10.1016/j.sapharm.2013.10.006 [PubMed]

20. Matalqah LM, Radaideh KM, Sulaiman SAS, Hassali MA, Kader MASA. Relationship between patients' warfarin knowledge and anticoagulation control: results of a validated tool in Malaysia. J Pharm Biomed Sci. 2013;30(30):967–74.

21. Baker JW, Pierce KL, Ryals CA. INR goal attainment and oral anticoagulation knowledge of patients enrolled in an anticoagulation clinic in a Veterans Affairs medical center. J Manag Care Pharm. 2011;17(2):133–42. https://doi.org/10.18553/jmcp.2011.17.2.133 [PubMed]

22. Mayet AY. Patient adherence to warfarin therapy and its impact on anticoagulation control. Saudi Pharm J SPJ. 2016;24(1):29. https://doi.org/10.1016/j.jsps.2015.02.005 [PubMed]

23. Demir Korkmaz F. Do patients with mechanical heart valves have the appropriate knowledge regarding warfarin therapy and can they adhere to the correct dosage? Turkish J Thorac Cardiovasc Surg. 2015 Jan 13;23(1):58–65. https://doi.org/10.5606/tgkdc.dergisi.2015.10390 [Full Text]

24. Tang EOYL, Lai CSM, Lee KKC, Wong RSM, Cheng G, Chan TYK. Relationship between patients' warfarin knowledge and anticoagulation control. Ann Pharmacother. 2003 Jan 1;37(1):34–9. https://doi.org/10.1345/aph.1A198 [PubMed]