

A study on the current status and perioperative management of antithrombotic in a general hospital

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Abstract

The purpose of this study is to investigate the actual status of antithrombotic management before and after the procedure or surgery, the difference between the duration of medication suspension by clinical and demographic characteristics, and the patient's understanding and satisfaction after medication management by a dedicated nurse. The results were as follows. The most commonly used antithrombotic agents were aspirin and flavitol. The drug discontinuation period according to antithrombotic, procedures, and underlying diseases, there was a significant difference in duration for each variables ($p < .000$). In the case of antiplatelet drugs, 5-day suspension was the most frequent, and anticoagulants 2-day suspension was the most frequent. Depending on the procedure, colonoscopy, nucleoplasty, rotator cuff repair, and total knee arthroplasty commonly showed more than 80% of 5-day discontinuation. The differences according to underlying diseases are as follows. 64.7% of all diseases discontinued on the 5th. The patient's understanding of the nurse's medication management performed before and after the procedure was found to be lower in Angina patients than those with other diseases. In terms of age, those in their 50s showed higher understanding than other age groups. There were no differences in understanding and satisfaction with the remaining characteristics.

Keywords: Antithrombotics, Antiplatelets, Anticoagulants, Medication, Surgery

1. INTRODUCTION

As cardiovascular and cerebrovascular diseases gradually increase due to aging population and changes in life and eating habits, the number of patients taking antiplatelet drugs such as aspirin and anticoagulants such as warfarin to prevent and treat these diseases is increasing. Antithrombotic agents are widely used to prevent thrombosis in arteries and veins, largely classified as antiplatelet, anticoagulants, and fiber solubilizers, and most of the medications taken for oral use are antiplatelet and anticoagulants [1]. However, the risk of bleeding in patients taking antithrombotic drugs may increase in the case of surgery, diagnosis, and examination for treatment purposes [2]. Therefore, in the case of general surgery except heart and vascular surgery, surgeons recommend or postpone the operation to patients who were taking antithrombotic drugs to prevent bleeding before and after surgery. On the other hand, discontinuation of antithrombotic drugs before surgery can increase the risk of myocardial infarction, cerebral infarction, and thromboembolism [3], and serious cardiovascular complications can. Even when gastroscopy and biopsy are performed, there is a risk of bleeding

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in patients taking antithrombotic drugs, but stopping taking antithrombotic drugs can lead to more serious cardiovascular complications[4].

Aspirin, a representative antiplatelet drug among antithrombotic drugs, is known to be effective in secondary prevention in patients with myocardial infarction or cerebral infarction, so it is necessary to consider whether to continue taking antithrombotic drugs before surgery. 9TH American College of Chest Physicians (ACCP) guidelines[5] suggest that patients with moderate or high risk of cardiovascular accidents continue to take acetylsalicylic acid for non-heart surgery that does not require emergency. However, low-risk patients are advised to stop taking it for 7 to 10 days before surgery[6]. Therefore, proper management of antiplatelet and anticoagulants before and after surgery is important for surgery, anesthesia, and recovery. The Korean Institute for Health Care Accreditation issued a patient safety warning under the theme of 'Error in managing antithrombotic medication before and after surgery' [7]. The warning includes major cases of serious harm to patients due to the suspension of antithrombotic agents for more than necessary periods of time to prevent accidents and recurrence, recommendations and preventive activities. In order to prevent accidents that can cause harm to patients with antithrombotic indications, it is recommended to check the patient's dosage history before surgery and procedure. In addition, if antithrombotic drugs are temporarily stopped, a plan for the suspension and resumption of antithrombotic drugs is prepared and related information is shared with patients in consideration of the risk of bleeding, stroke, and heart disease. In addition, if the risk of bleeding stabilizes after surgery or surgery, he/she is advised to resume antithrombotic administration as soon as possible. In addition, in order to prepare a plan to stop thrombotic drugs, it should be carefully reviewed through a multidisciplinary approach, along with the department responsible for prescribing antithrombotic drugs for each disease, surgery, and procedure[7]. Advanced medical technology, informatization, increased awareness of rights of consumers, and strengthening patient safety and infection control caused diversification of demands for medical services[8]. Domestic medical institutions have created the roles of various nurses, including dedicated nurses, Physician Assistant (PA), Surgical Assistant (SA), full-time nurses, and medical cooperation nurses, to address the shortage of residents[9]. Unlike advanced countries, medical counseling nurses were introduced to compensate for the problem of the domestic medical community, which has very insufficient doctor's treatment time. Patients who come to the hospital have a lot of questions about their diseases, and their expectations are much higher than in the past, so they need to differentiate their services now. Accordingly, as part of efforts to resolve the needs of patients and guardians, the hospital has deployed nurses specializing in education for patients. This study was conducted to investigate the status of perioperative management of antithrombotics by a dedicated nurse at a general hospital according to the 9TH American College of Chest Physicians (ACCP) guidelines[5]. In detail, this study attempted to explore the difference between the duration of medication suspension by clinical and demographic characteristics, and the patient's understanding and satisfaction after management by a dedicated nurse.

2. METHODS

2.1 Study Design

This study is a descriptive research to explore the actual status of antithrombotic management for patients before and after the procedure or surgery.

2.2 Participants

Subjects were patients taking antithrombotic drugs scheduled for procedure or surgery at a general hospital, and those who received management of drugs from a dedicated nurse according to the prescription. Data

collection was conducted using the structured questionnaires for 5 months on 2021 and cooperated with a dedicated nurse working at the institution. All participants received explanations of the study and signed an informed consent before participating. We explained that participants could be dropped at any time during the study. 128 people were collected in consideration of the sample size through the G power program calculated and dropout, and 116 were finally analyzed.

2.3 Measures

2.3.1 General and clinical characteristics

The general characteristics of the subjects consisted of gender, age, educational status, type of antithrombotics, discontinuation days, type of procedures, type of underlying diseases.

2.3.2 Understanding

The measurement of the patient's educational understanding was performed by modifying the organ transplant patient medication map survey used by [10]. to suit this study. The questionnaire is a 5-point scale with a total of 7 questions, ranging from 'knowing well' to 'not knowing at all', and the higher the score, the higher the understanding of education. In this study, the reliability was Chronbach's 0.87.

2.3.3 Satisfaction

For the measurement of the patient's satisfaction, the outpatient medication guidance questionnaire used by [11] was modified and used. The questionnaire is a 5-point scale with a total of 10 questions, and the higher the score, the higher the satisfaction with education. In this study, the tool reliability was Chronbach's 0.92.

2.3.4 Management to antithrombotics

The hospital's educational manual based on the discontinuation guidelines presented by doctors in the 9TH American College of Chest Physicians (ACCP) guidelines[5], which are used as antithrombotic discontinuation criteria, was used. The guidelines and the contents of management are as follows.

- A. Name and shape of the drug, action and side effects, process of the procedure, reasons for stopping taking it, re-dosing after the procedure, and how to deal with symptoms after discontinuation.
 - Suspension days by drug.
 - Warfarin: All surgeries and procedures - 5 days/ - new oral anticoagulant(NOAC):
Local anesthesia colonoscopy - 2 days/ Spinal anesthesia and general anesthesia - 5-7 days
 - Antithrombotic drugs other than warfarin and NOAC: 5-7 days
 - Discontinuation of cardiovascular disease is determined in consultation with primary physician and surgeon
- B. Telephone counseling during the discontinuation period: Check whether the suspension is maintained, and whether side effects or symptoms appear.
- D. Re-administration(RA) after surgery: -the next day for local anesthesia or surgery with less bleeding.
 - Spinal anesthesia, general anesthesia, bleeding-prone surgeries and procedures are RA at the doctor's judgment./ RA on the same day after colonoscopy./ colon polyp removal, RA at the discretion of the doctor according to the size, number, and tendency of bleeding of the polyp.

2.4 Data analysis

Statistical analysis was performed by using the SPSS program v22. Descriptive statistics, ANOVA, and χ^2 were used for group comparison, etc.

3. RESULTS

3.1 Characteristics of subjects

A total of 116 subjects in this study, and the frequency of each demographic and clinical characteristics is shown in Table 1. Although not presented in the table, according to the analysis of the types and frequency of antithrombotic drugs taken by the subjects, 52 people (43%) took aspirin alone, 23 people (19%) took up to 2-3 drugs combined with Aspirin and Flavitol (15.7%), 8 Xarelto (6.6%), and less than 2 other 7 drugs (12.8%) each (Cilostazol, Triflusal, Pradaxa, Renexin, Eliquis, Yuclid).

3.2 Discontinuation period depending on the type of antithrombotic agent

The results of are as follows. The most common discontinuation period of antiplatelet drugs was 71% on 5 days, 66.7% for patients taking anticoagulants on 2 days, 50% for patients taking antiplatelet and anticoagulants on 1 day, and 50% for 2 days ($p < .000$) (Table1).

Table 1. Discontinuation period depending on the type of antithrombotic (N=116)

Antithrombotics		duration of discontinuation				Total	$\chi^2(p)$
		1day	2days	5days	7days		
Antplatelets (a)	N	15	0	71	13	99	
	%	15.	.0	71.7	13.1	100.0	
Anticoagulants (b)	N	1	10	3	1	15	75.86 (.000)
	%	6.7	66.7	20.0	6.7	100.0	
(a)+(b)	N	1	0	1	0	2	
	%	50.	.0	50.0	.0	100.0	
Total	N	17	10	75	14	14	
	%	14.7	8.6	64.7	12.1	12.1%	

$p < .001$

3.3 Discontinuation period depending on the procedure

Comparing the discontinuation period of drug use according to the procedure, 82.8% of colonoscopy cases were discontinued for 5 days. Neuroplasty had the highest daily suspension of 77.3%, Neucleoplasty had the highest five-day suspension of 84.6%, Posterior Stenoscopic lumbar decompression had the highest seven-day suspension of 100%, Rotator cuff Repair and TKA had the highest five-day suspension of 100%, and Prostate biopsy had the seven-day suspension of 100% ($p < .000$) (Table2).

Table 2. Discontinuation period depending on the procedure (N=116)

Types of Procedure		duration of discontinuation				Total	$\chi^2(p)$
		1day	2days	5days	7days		
Colonoscopy	N	0	8	53	3	64	154.20 (.000)
	%	.0	12.5	82.8	4.7	100	
Neuroplasty	N	17	2	2	1	22	
	%	77.3	9.1	9.1	4.5	100	
Neucleoplasty	N	0	0	11	2	13	
	%	.0	.0	84.6	15.4	100	
*PSDR	N	0	0	0	6	6	
	%	.0	.0	.0	100	100	
Rotator cuff Repair	N	0	0	5	0	5	
	%	.0	.0	100	.0	100	
Total knee arthroplasty	N	0	0	4	0	4	
	%	.0	.0	100	.0	100	
Prostate biopsy	N	0	0	0	2	2	
	%	.0	.0	.0	100	100	
Total	N	17	10	75	14	116	
	%	14.7	8.6	64.7	12.1	100	

$p < .001$, * PSDR: Posterior Stenoscopic lumbar decompression

Table 3. Discontinuation period depending on the procedure (N=116)

Underlying disease		duration of discontinuation				Total	$\chi^2(p)$
		1day	2days	5days	7days		
Diabetes	N	3	0	10	1	14	56.572 (.000)
	%	21.4	0	71.4	7.1	100	
Cerebral infarction	N	5	1	21	5	32	
	%	15.6	3.1	65.6	15.6	100	
Arrhythmia	N	0	8	5	2	15	
	%	.0	53.3	33.3	13.3	100	
Angina	N	3	0	14	0	17	
	%	17.6	.0	82.4	.0	100	
Myocardial infarction	N	3	0	7	3	13	
	%	23.1	.0	53.8	23.1	100	
Hyper-tension	N	0	0	4	1	5	
	%	.0	.0	80.0	20.0	100	
Carotid artery stenosis	N	0	0	6	1	7	
	%	.0	.0	85.7	14.3	100	
Hyper-lipidemia	N	1	0	4	0	5	
	%	20.0	.0	80.0	.0%	100	
remainder	N	2	1	4	1	8	
	%	25.	12.5	50.0	12.5	100	
Total	N	17	10	75	14	116	
	%	14.7	8.6	64.7	12.1	100	

$p < .001$

Table 4. Differences in education understanding and satisfaction according to the general and clinical characteristics (N=116)

Variables	Categories	N	%	Understanding		Satisfaction	
				M±SD	t or F (p)	M±SD	t or F (p)
sex	Male	104	86	11.48±3.86	-.083 (.935)	45.38±4.4	.168 (.867)
	Female	12	9.9	11.58±4.1		45.17±4.1	
Underlying disease	Diabetes (a)	14	11.6	11.43±4.01	4.680 (.000) all>d	43.85±3.6	1.828 (.080)
	Cerebral infarction (b)	32	26.4	11.47±4.12		45.23±4.7	
	Arrhythmia ©	15	12.4	9.87±2.23		46.07±3.9	
	Angina (d)	17	14.0	8.76±1.82		47.59±3.3	
	Myocardial infarction (e)	13	10.7	12.38±4.11		44.85±4.6	
	hypertension (f)	5	4.1	13.40±3.05		46.6±3.8	
	Carotid artery stenosis (g)	7	5.8	12.57±3.15		43.86±4.3	
Procedure /surgery Types	Colonoscopy	64	52.9	11.08±3.9	.581 (.745)	46.02±4.4	.848 (.536)
	Neuroplasty	22	18.2	12.41±4.5		45.00±3.9	
	Neucleoplasty	13	10.7	11.54±3.5		43.23±3.8	
	*PSDR	6	5.0	10.33±2.5		45.00±4.5	
	Rotator cuff Repair	5	4.1	12.60±1.7		44.80±4.8	
	Total knee arthroplasty	4	3.3	13.00±4.2		45.00±4.2	
	Prostate biopsy	2	1.7	12.00±5.7		45.50±6.4	
Duration of Discontinuation	1day	17	14.0	11.65±4.3	1.463 (.229)	11.65±4.3	.676 (.568)
	2days	10	8.3	9.70±2.8		9.70±2.8	
	5days	75	62.0	11.41±3.8		11.41±3.8	
	7days	14	11.6	13.00±4.2		13.00±4.2	
Antithrombotics	Antiplatelets(a)	99	81.8	11.59±3.9	.694 (.501)	45.30±4.2	.095 (.909)
	Anticoagulants(b)	15	12.4	10.60±3.7		45.80±4.2	
	(a)+(b)	2	1.7	13.50±3.5		45.00±4.2	
Side effect	Yes	8	6.6	13.63±3.9	1.62 (.106)	47.00±5.2	.608 (.545)
	No	105	89.3	11.33±4.4		45.49±4.2	
Age (yr)	50-59(a)	2	1.7	19.50±2.1	3.68 (.014) all<a	40.00±.0	1.706 (.170)
	60-69(b)	8	6.6	9.88±2.6		47.00±3.6	
	70-79(c)	99	81.8	11.4±3.8		45.71±4.1	
	≥ 80(d)	7	5.8	12.29±2.9		44.43±5.3	
Education	≤ Middle school	28	23.1	10.25±3.3	2.03 (.135)	45.58±4.6	.009 (.991)
	High school	55	45.5	11.75±4.2		45.58±4.2	
	≥ College	33	27.3	12.12±3.5		45.70±3.9	

p<.001, p<.05. * PSDR: Posterior Stenoscopic lumbar decompression

3.4 Discontinuation period depending on the underlying disease

The results of are as follows. 53.3% of those with Arrhythmia stopped taking it for 2 days. For the rest of the patients with diseases, the discontinuation period of the drug was most often 5 days. (Diabetes 71.4%, Cerebral infrastructure 65.6%, Angina 82.4%, Myocardial infrastructure 53.8%, hypotension 80%, Carotid history 85.7%, Hyperlipidemia 80%, remaining underlying diseases 50%) ($p < .000$) (Table3).

3.5 Differences in understanding and satisfaction according to the general and clinical characteristics

The results of are as follows. There was a difference in educational understanding according to age ($p < .014$), there was a difference in educational understanding according to the diagnosis of the underlying disease ($.000$). In detail, the understanding of the age group in their 50s was significantly higher than that of other age groups in their 60s, 70s, and 80s or older. In terms of understanding according to diagnosis, subjects diagnosed with Angina had the lowest understanding of education compared to all patients with underlying diseases (Table 4).

4. DISCUSSION

This study investigated the status of antithrombotic management by dedicated nurses for patients scheduled for invasive procedures or surgery, focusing on a case of general hospitals. The results of study were as follows. The most commonly used antithrombotic agents were aspirin and flavitol, which are antiplatelet drugs. The drug discontinuation period according to antithrombotic, procedures, and underlying diseases, there was a significant difference in duration for each variables ($p < .000$). In the case of antiplatelet drugs, 5-day suspension was the most frequent, and anticoagulants 2-day suspension was the most frequent. Depending on the procedure, colonoscopy, nucleoplasty, rotator cuff repair, and total knee arthroplasty commonly showed more than 80% of 5-day discontinuation. In the case of Prostate biopsy and posterior stenoscopic Lumbar Decompression, 7-day discontinuation was the highest at 100%. In addition, Neuroplasty was the shortest with a one-day suspension. The differences according to underlying diseases are as follows. 64.7% of all diseases discontinued on the 5th, and in the case of Arrhythmia alone, discontinuation on the 2nd was more than 50%. The patient's understanding of the nurse's medication management performed before and after the procedure was found to be lower in Angina patients than those with other diseases. In terms of age, those in their 50s showed higher understanding than other age groups. There were no differences in understanding and satisfaction with the remaining characteristics. Taken together, procedures such as colonoscopy and posterior stenoscopic Lumbar Decompression, which persist for more than 5 days, are highly invasive procedures requiring incision and may have been judged to have a very high risk of bleeding by medical staff.

5. CONCLUSION

This study attempted to inform the necessity of strengthening the dedicated nurse system for safe antithrombotic management by reporting the actual situation centering on special cases of hospitals that assigned dedicated nurses. In addition, in a situation where the guidelines for administration of antithrombotic drugs according to the procedure are not clear and are determined through consultation with medical staff, the results of this study can be used as information necessary for future unified manual development by classifying various clinical characteristics. It is necessary to classify low-risk to high-risk procedures in detail, and cross-analysis according to discontinuation dates, underlying diseases, types of drugs (antibody platelets, anticoagulants), side effects or bleeding. In addition, it is suggested that a comprehensive comparative study is needed on the rate of patient discontinuation, side effects after the procedure, and procedural errors in

hospitals with and without a nurse dedicated to medication management.

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