SHAREme.

Scientific Hub of Applied Research in Emerging Medical science & technology

Received: 27.03.2022 Revised: 08.04.2022 Accepted: 21.04.2022

check for updates

Research Article

Impact of clinical pharmacist intervention on the use of oral anti clotting agents

Arudra Mounika Kumari [*1], Chilakala Priyanka [1], Rudru Priyanka [1]

[1] *Department of Pharmacy, MLR institute of Pharmacy, Hyderabad, Telangana, India.*

Anticoagulants and antiplatelet agents are drugs that reduce blood flow to the arteries, veins, or heart. Blood clots can block the flow of blood to your heart and cause heart disease. Effective treatment improves patient adherence, citing fewer cases of treatment failure and bleeding problems. To study the impact of clinical pharmacist in anti-clotting therapy. Testing information for anticlotting treatment, to assess adherence of a patient to therapy, to assess drug interactions and adverse effects in therapy by pharmacist intervention. Expected randomized trial - a control intervention study was conducted for a period of 6 months in the department of general medicine, cardiology, and neurology at a regular public hospital in Guntur. A total of 187 patients with anti-clotting treatment were randomly assigned and analyzed information on a list of questions about anti-clotting treatment. Information was assessed in both groups before and after the study and the mean score at the beginning of the control group before the study was 2.39 ± 2.18 and after 2.50 ± 2.30 (P = 0.078), with the result of the intervention group initially 2.15 ± 1.67 and after 3.98 ± 2.05 (p = 0.001) and Mo's adherence score in the intervention group 4.01 ± 1.84 and after 2.07 ± 1.32 (p = 0.001) and control group 3.80±1.84 and after 3.72±1.81 (p=0.2387) and 7 bleeding complications and 24 interactions in control and 7 with bleeding and 8 interactions in intervention group were found. Research findings conclude that pharmacist interventions play a role in anticlotting treatment to improve adherence and information improves quality of life.

Keywords: Anti-clotting agents, Ischemic stroke, Adverse drug reactions, Prothrombin time, Morisky scale.

1. Introduction

Anticoagulants and antiplatelet agents are drugs that reduce blood flow to the arteries, veins, or heart. Blood clots can block the flow of blood to your heart muscles and cause heart disease. It can also block the flow of blood to your brain, causing a stroke. Antidepressants are used to prevent blood clots, and as a result reduce the risk of certain cardiovascular diseases such as heart attacks and strokes. As the name implies, they make sure that blood does not turn over quickly.

The term "blood thinner" is not entirely true, for the drug does not reduce blood pressure, but rather make sure that certain blood components do not mix easily. Antidepressants can be divided into two groups: Anticoagulants stop the thickening of things that are not building or working. Antiplatelets prevent blood platelets (thrombocyte) from breaking down easily.

An anticoagulant is a (blood thinner) drug that treats, prevents, and reduces the risk of blood clots and damage to vital organs, which can lead to life-threatening conditions. They work by stopping the blood from clotting to make way for the vital organs such as the heart, lungs, and brain. Anticoagulant therapy is used to prevent the formation of new blood clots, and to treat existing clots by preventing them from growing in size. It also reduces the risk of

Correspondence should be addressed to
Arudra Mounika Kumari; mounika.arudra@gmail.com

clotting of other vital organs such as the lungs and brain.

Antiplatelets are drugs that inhibit platelet function, which helps blood clot after injury. Antiplatelets are used to avoid situations where the blood can become very thick, which can cause heart disease or stroke.

Under normal circumstances, platelets play an important role in blood clotting, thickening (stopping bleeding). When a small blood vessel is damaged, platelets begin to form (platelet aggregation). They also attach to the sides of the damaged tissue to form a plug, which is covered with fiber-like fibrous fibers. Soon the blood clot (plug) shrinks in its place and prevents any further blood loss. Platelets also release chemicals that begin the healing process. Without this vital platelet function, excessive and potentially life-threatening blood loss would be lost after cuts or bruises.

2. Objective

- To assess the medication adherence.
- To provide the best patient counselling and assess how counselling plays an important role in improving the health outcome in anti-clotting agents using patients.
- To monitor adverse effect reactions and
- To reduce hospitalization.

3. Methodology

The study was conducted in the department of general medicine and in the department of cardiology at the state-run general hospital, Guntur. The study was proposed to be conducted in the following 6 months period i.e., from October 2017- March 2018.The study obtained ethical approval from the institutional ethics committee and informed written consent was obtained from all study participants. The study population included patients admitted to the general medical and cardiology department and given oral anti-clotting agents. The intervention group included all 93 patients randomly assigned to conventional and cardiac medicine during the study period and who satisfied the inclusion and exclusion criteria. Ninety-four (94) patients randomly selected from the general medical and cardiology department regarding the oral use of anti-clotting agents used as a control group. Relevant patient data in the study were obtained through direct interview with the patient and / or caregiver, as well as the patient medical record and recorded in the data collection form.

Inclusion Criteria

- Patients with oral anti-clotting therapy (Irrespective of gender)
- Patient above 18years of age
- Both male and female patients irrespective of genders
- Patients who are willing to give informed consent

Exclusion Criteria

- Patients who are with severe renal insufficiency
- Patients having visual or hearing impairment.
- Patients with psychiatric disorder.
- Patient using parenteral anticlotting therapy.

The data collection form was provided with information about patient statistics, blood pressure (BP), aggregate conditions, index of anti-clotting agents, laboratory data including international standard (INR) values, prothrombine time (PT). Data on adverse drug side effects (ADR) related to anti-clotting, drug and food interactions, adherence were measured using the MO risky adherence scale and the questionnaire was used to assess patient information about oral anti-clotting agents.

Patient information about oral contraceptives was assessed using a 10-question questionnaire. 0 to 10 points are given for each question, respectively. During the study, basic information about oral contraceptives and their significance, ADRs are common and management, patient compliance importance, dosage, diet modification, and INR requirement, PT monitoring. Information leaflets were also distributed to all patients and referred patients to the intervention group after 1 month.

4. Statistical Analysis

Recorded data was captured on Microsoft excel 2010 and SPSS. Statistical analysis was performed using graph pad prism and SPSS. All values are expressed in

real numbers, percentages, and definitions ± standard deviation. Student paired t-tests were used for non-parameter data. The probability that a "p" value less than 0.05 is considered statistically significant.

Table: 1 Summary of Baseline Characteristics of The Study Patients (N=187)

Characteristics	Intervention (N=93)	Control (N=94)
Total no of Patients	93	94
Males(no%.)	59 (63.4%)	47 (50%)
Females(no%.)	34 (36.5%)	47 (50%)
Mean age of male patients (years)±S.D.	55.537±12.558	57.184±11.980
Mean age of female patients (years)±S.D.	55.395±13.05	57.021±11.903
Patients with no comorbidity	39	31
Patients with ≥1comorbidity	54	63
% of patients with goal PT/INR		
No of patients with bleeding	4	7
Drug interactions found	12	24

The total amount of patients employed at the start of the study was 207. Table.1 summarizes the basic characteristics of patients in the involvement and control groups.

Table: 2 Mean Ages of two groups

Characteristics	Intervention	Control
Age (mean age±S.D)	55.537±12.558	57.184±11.980

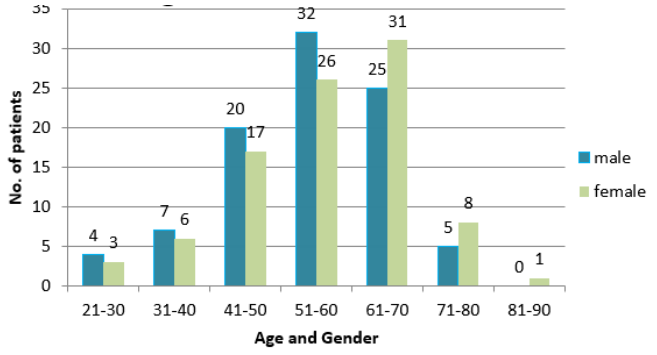

Fig. 1. Age and Gender wise distribution

In total of 187 study population recruited it was observed that 56.68% of male more than compared to female percentage is 43.31%. Patients with an average median age group were 55.53 ± 12.55 with a minimum age of 25 and a maximum age of 74 and that of the control group patients was 57.02 ± 11.90 minimum age of 29 years and a maximum age of 84 years.

Table: 3 Age wise distribution of sample population

Age	Male	Female
21-30	4	3
31-40	7	6
41-50	20	17
51-60	32	26
61-70	25	31
71-80	5	8
81-90	0	1

By reviewing all the demographics data among 187 population most of the members 58(31%) aged between 51-60 years and male(32) are more compared female(26) and by observing above diagram by increasing age female are more prone to disease than male.

Among 187 patients' males are 107(56.6%) and females are 81(43.3%) so, males are more compared females and total population are randomized into two groups intervention(93) and control (94).

Table: 4 Gender wise distribution

Gender	No. of population
Male	106
Female	81

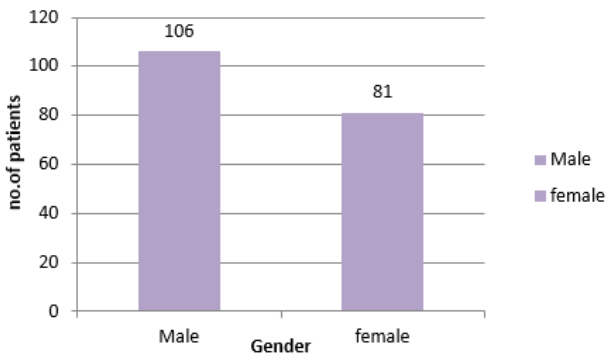

Fig. 2. Gender wise distribution

Among sampled population 43(22.9%) members are smokers and 40(21.3%) members are alcoholics and 42(22.4%) are both with smokers and alcoholics.

Table: 5 Social Habits

Social Habits	No. of population
Smoking	43
Alcoholic	40
Both	42

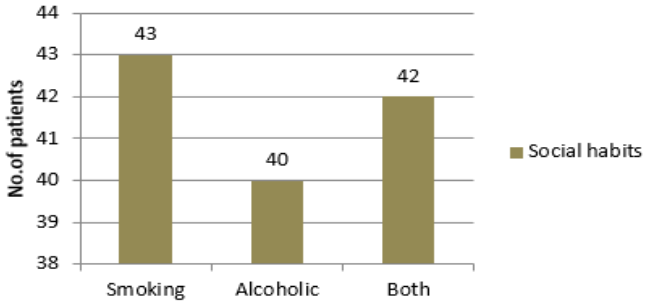

Fig. 3. Social Habits

Among 187 population included in the study using anti-clotting agents using members with comorbidities like HTN are 54(28.8%) and HTN+DM are (18.18%) and HTN+CVA are 2(1.06%) and HTN+CAD are 6 (3.20%) and DM are 8(4.27%).

Table: 6 Comorbidities

Comorbidities	No. of population
HTN	54
HTN+DM	34
HTN+CVA	2
HTN+CAD	6
DM	8

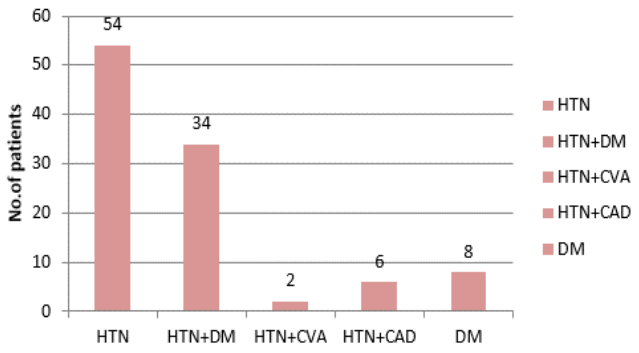

Fig. 4. Comorbidities

Adverse Effects:

Among 187 study population in intervention group out of 93- 4(4.3%) with bleeding, 1(1.07%) with bruising, 2(2.15%) with git complications, 1(1.07%) with headache, and in control group out of 94 – 7(7.44%) with bleeding, 3(3.19%) with bruising, 4(4.25%) with git complications, 2(2.12%) with headache.

Table: 7 Study population with adverse effects

Adverse Effects	Intervention	Control
Bleeding	4	7
Bruising	1	3
Git complication	2	4
Headache	1	2

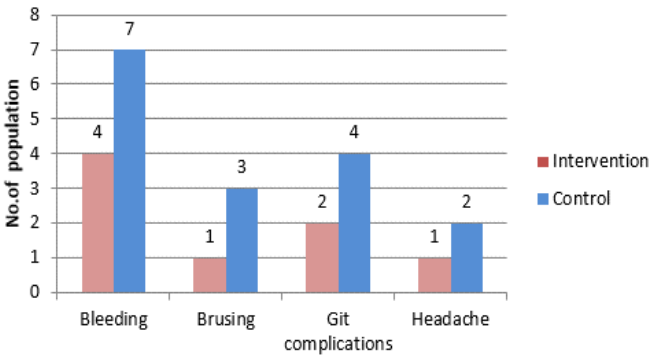

Fig. 5. Adverse Effects

Type of drugs used:

Total population considered in study were with different drug therapy like patients with acitrom are 15(8.02%), withacitrom + aspirin are11(5.88%) , with aspirin 8(0.42%),with aspirin + clopidogrel + warafarin are 4(2.13%), with aspirin + clopidogrel + acitrom are 10(5.34%), aspirin + clopidogrel are 139(74.33%).

Table : 8 Type of drugs used

Types of drugs used	No. of patients
Acitrom	15
Acitrom+Aspirin	11
Aspirin	8
Aspirin + clopidogrel + warfarin	4
Aspirin + clopidogrel+ acitrom	10
Aspirin + clopidogrel	139

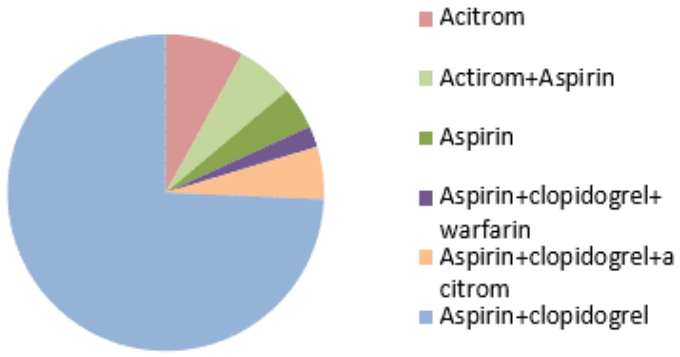

Fig. 6. Type of drugs

Sample with CVA (92)

Among 187 patients 92(49.1%) are with stroke disease in that 28(30.4%) members are with recurrent stroke and 64(69.5%) are with first stroke.

Table : 9 Sample with CVA (92)

Types of stroke	No. of patients
Recurrent stroke	28
First stroke	64

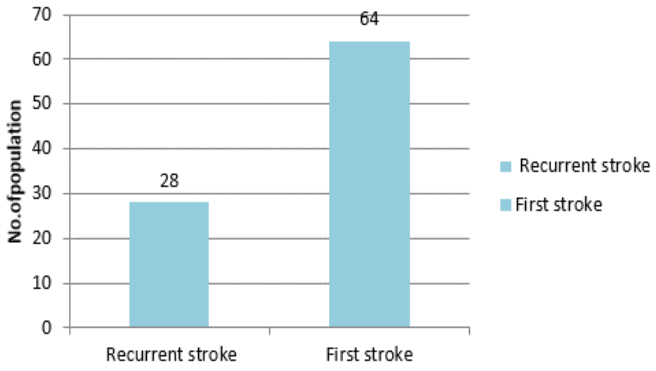

Fig. 7. Sample with CVA (92)

By Mo risky adherence scale assessed the adherence of study population on drugs found in intervention arm adherence was improved after counselling. Figure 8 includes the Mo risky adherence scale value of 0 to 8 for high, medium and low adherence.

Table: 10 Score of medication adherence by Mo risky adherence scale

Time frame	Intervention (Mean ±S.D)	Control (Mean ±S.D)
Before counselling	4.01±1.84	3.80±1.84
After counselling	2.07±1.32	3.72±1.81

Adherence	MMAS-8 Score
High Adherence	0
Medium Adherence	1-2
Low Adherence	3-8

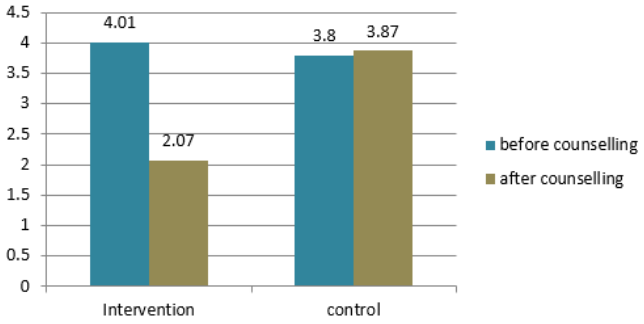

Fig. 8. Adherence score

Table: 11 Scoring of patient knowledge on oral anti-clotting agents

Time frame	Intervention (Mean ±S.D)	Control (Mean ±S.D)
Before counselling	2.15±1.67	3.98±2.05
After counselling	2.39±2.18	2.50±2.30

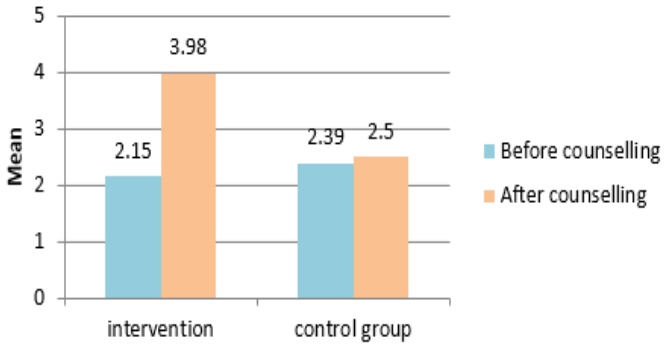

Fig. 9. Patient knowledge score on drugs

Patient baseline information was assessed with a valid internal questionnaire and the baseline information of patients' baseline in the intervention group was found to be 2.15 ± 1.67. One month after counseling, patient information for the mediation group was reviewed and the score was increased to 3.98 ± 2.05. Here, it is clear that the patient's knowledge of oral contraceptives has improved after consultation with a medical pharmacist in the mediation group. The baseline information of the patients in the control group about oral anti-clotting agents was further evaluated using the same questionnaire and scores averaged 2.39 ± 2.18 and score after 1 month was 2.50 ± 2.30. Patients in the

control group received only 'general care' from physicians.

A paired sample t-test was used to compare patient information points before and after the mediation in the intervention group. P value of 0.001 ($p < 0.005$) indicates a statistically significant difference between the information points of the patients in the intervention group after counseling. However, in the control group there was no significant difference between the two points (2.39 ± 2.18 and 2.50 ± 2.30) the P value was 0.078 ($p > 0.005$) not statistically significant which is, obviously, the intervention of a medical pharmacist improved the patient's knowledge to oral anti-clotting agents.

5. Discussion

We conducted a randomized controlled trial intervention study to assess patient information on oral use of anti-clotting agents before pharmacist counselling and after counselling and to assess adherence to medication, patient satisfaction and quality of life of a patient.

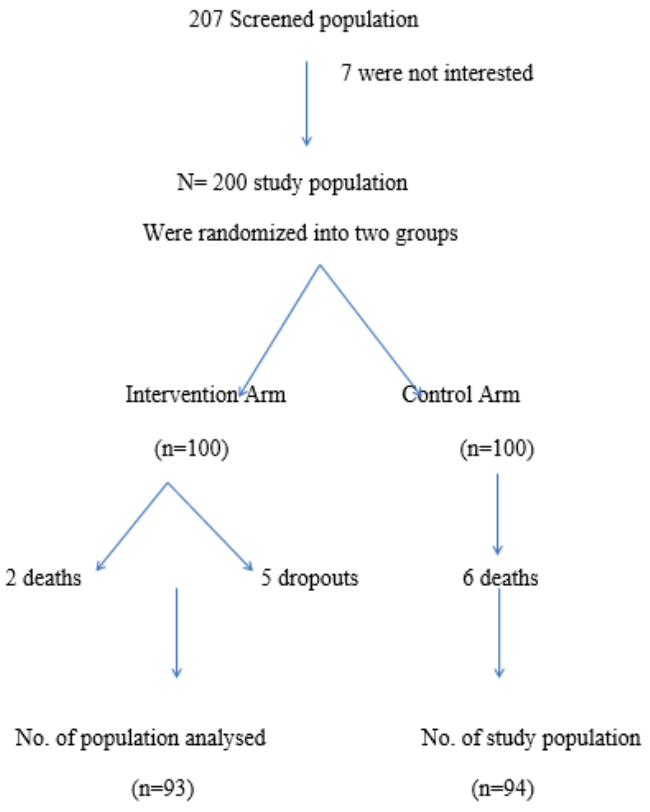

Fig. 10. Study Chart

In our study, a total of 207 patients were screened out of 207 population screened 7 were not interested in study and out of 200 are randomized into two groups intervention(n=100) and control group(n=100) but there are dropouts in the study 2 deaths and 5 were dropped from study they couldn't attend follow up and in control group 5 deaths and remaining population were n=94 in control group and n=93 in interventional group.

In study included population was randomized into two arms based on method simple randomization to avoid bias, divided our study population based on hospitalization if first hospitalized into intervention arm and second into control arm continuously.

In present study population included are 49.7% population in intervention and 50.2% population in control group which was comparable to study was conducted by R. Lakshmi et al.

In present study out of 187 population in arm one i.e. is intervention arm males are 63% and female are 36% and in control arm males are 50% and females are 50%. The mean age of male patients in the mediation arm was 55.53 ± 12.55 and a minimum of 25 years and the age limit of 74 and the control arm age was 57.02 ± 11.90 years at least 29 and a maximum of 84 years compared with the study was conducted by R. Lakshmi.et al.

Among 187 population included in the study using anti-clotting agents in intervention arm population with No comorbidities 37.6%, with one comorbidity 35.4%, with two comorbidities 22.5%, with three comorbidities 4.30% and in control arm population with No comorbidities 30.8%, 43.6% are with one comorbidities, 23.4% are with two comorbidities, 2.12% are with three comorbidities, and largest population with hypertension.

During study period Anti-clotting agents are indicated for the diseases like coronary artery disease and atrial fibrillation and stroke in both the groups.

In present study a questionnaire was used to assess knowledge on use of oral anti-clotting agents included study population in two arms to assess baseline knowledge score in intervention arm was 2.15 ± 1.67, study population in intervention group were counselled by a pharmacist about use, dose, administration

techniques, unwanted effects and adherence of oral anticlotting agents and then after one month follow up, in post counselling same questionnaire given to study population in intervention arm then knowledge score was increased to 3.98±2.05 on use of oral anti-clotting agents. In control arm baseline knowledge score 2.39±2.18 and after one month post counselling score was 2.50±2.30, by make use of paired sample t-test we found value of p is 0.078(p>0.005) not statically significant. For the intervention arm using a paired sample t-test the value obtained was 0.001 (p <0.005) statistically significant it indicates and there was an pharmacist role in improving the knowledge on use of oral anticlotting agents which was similar to the research conducted by E Kirthivasan.et.al., Research into the Impact of Clinical Pharmacy Interventions on the Effective Use of Oral Anticoagulants in Stroke Patients.

During search adherence on drugs by study population was assessed by Mo risky Adherence scale by a adherence scale score was calculated to adherence by study population in both arms

In Intervention arm, adherence score before counselling was 4.01±1.84 and after two to three months post counselling score was 2.07±1.32 by using paired sample t-test p value obtained 0.001 (p <0.005) is statistically significant and controls the grip of the arm using a critical grip scale Mo 3.80 ± 1.84 and after two to three months the follow-up result was re-evaluated 3.72 ± 1.81 using the t-value obtained value was a statistically significant 0.2387 (p> 0.005) indicating the pharmacist's role in improving drug adherence.

By providing periodic counselling it was found that there was significant improvement in knowledge on drugs increasing adherence and reducing drug-food interactions and drug-drug interactions reducing hospitalization of a patient reduces economic burden of patient and improving quality of life of patient.

6. Conclusion

Patient knowledge is the key to the safe and effective use of warfarin and other oral anticoagulants. Patients should be aware of indications, precautionary requirements, drug and drug interactions and adverse reactions to be observed. There is a positive relationship between their knowledge and the effects of treatment. The current study shows that patient knowledge of oral anticoagulation was improved in patients in the intervention group and experienced a better treatment outcome compared to patients in the control group. The results of the study conclude that pharmacist interventions play a role in antilotting treatment to improve adherence and information, improving quality of life.

REFERENCE

[1] Davì G, Patrono C. Platelet activation and atherothrombosis. N Engl J Med. 2007 ;357(24):2482-2494.

[2] Patrono C, Coller B, FitzGerald GA, Hirsh J, Roth G. Platelet-active drugs: the relationships among dose, effectiveness, and side effects: the Seventh ACCP Conference on Antithrombotic and Thrombolytic Therapy.Chest.2004 ;126(3Suppl):234S-264S.

[3] R.lakshmi, Karthivasan. Clinical pharmacist interventions in optimal use of oral anticoagulants in stroke patients.Indian j pharm sci 2013;75(1);53-59.

[4] K.N.Anila, j. Emmanuel. clinical pharmacist intervention in oral use of anti-coagulation therapy. Asion pharm clin res, 2013:vol(6):149-152.

[5] Feher G, Feher A, Pusch G, Koltai K, Tibold A, Gasztonyi B, Papp E, SzaparyL,Kesmarky G, Toth K. Clinical importance of aspirin and clopidogrel resistance. World J Cardiol. 2010 ;2(7):171-186.

[6] Akturk IF, Caglar FN, Erturk M, Tuncer N, Yalcın AA, Surgit O, Uzun F, Caglar IM. Hypertension as a risk factor for aspirin and clopidogrel resistance inpatients with stable coronary artery disease. Clin Appl Thromb Hemost. 2014Oct;20(7):749-754.