

**Knowledge Regarding Oral Anticoagulant Therapy among Patient with Mechanical Heart Valve Replacement: A Cross-Sectional Study in Peshawar, Khyber Pakhtunkhwa.**

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**Abstract**

**Objectives:** To determine the knowledge of mechanical heart valve replacement patients regarding oral anticoagulants.

**Materials and Methods:** A cross-sectional study on patients with mechanical valve prostheses was conducted at Lady Reading Hospital Peshawar, Khyber Pakhtunkhwa, Pakistan. The duration of the study was 6 months. Overall, 345 participants were included in the study. Consecutive sampling technique has been used. Information was collected using adopted, validated questionnaire.

**Results:** Overall, 345 patients with mechanical valve prostheses were included in the study with mean age of the participants were 37.91 years. The age of the participants were ranging from 19 to 62 years. Male patients (59%) exceeded female patients (41%). Only 10% study patients received education regarding oral anticoagulant therapy. Majority (78.3%) patients had inadequate overall knowledge score regarding oral anticoagulants (Warfarin) while 16.5% had moderate

adequate knowledge and 5.2% had adequate knowledge score.

**Conclusion:** The majority of studied patients had inadequate overall knowledge regarding oral anticoagulant (Warfarin). Patient's education in health care setups is very low. Area of improvement in patient's education has been identified. There is need of strategies to improve the patient's knowledge regarding oral anticoagulant to minimize the risk of therapy.

**Keywords:**

Oral Anticoagulant, Warfarin, Knowledge, Mechanical heart valve replacement.

**Introduction**

Cardiovascular diseases (CVD) are the main cause of death. Around 30% to 40% of deaths globally are due to cardiovascular diseases. CVD cause more than 19% of deaths in the developing countries which is the highest number of death as compared to other diseases<sup>(1)</sup>. More than 65 million deaths worldwide are caused by cardiovascular diseases. 80% of all cardiovascular diseases occurred in developing countries<sup>(2)</sup>. Nearly accounts for nearly 610000 deaths per year which is one

out of three deaths in United States (US)<sup>(3)</sup>. Even the rate of mortality reduced from 1979 to 2015<sup>(4)</sup>. More than 26000 Trans-catheter aortic valve replacements have been performed from 2011 – 2014 at 348 centers in 48 states of America<sup>(5)</sup>.

One of the major categories of cardiovascular diseases is Valvular Heart Disease (VHD). Valvular heart disease is a significant problem in the developing countries in which the primary sufferers from Valvular heart diseases are children and adults. Valvular heart diseases prevalence is more common in men than women<sup>(6)</sup>. Moderate to severe Valvular diseases cases are notable more common in geriatric population. With aging, the valves of the heart deteriorate its function which lead to sever heart problems even death<sup>(7)</sup>.

To maintain the function of the heart of Valvular heart diseased patient and to reduce premature mortality from cardiovascular disease, valve replacement is necessary. Heart valve replacement is the most effective and appropriate management for Valvular Heart Disorders<sup>(8)</sup>.

The most common and effective procedure of cardiac valve replacement is the Prosthetic valve replacement, which is usually done when the cardiac valve is unable to perform its function. On one hand the procedure is effective and appropriate management of VHD, on the other hand this procedure has several complication which can even lead to death<sup>(9)</sup>. Bleeding, valve dysfunction of the replaced valve, heart rhythm problems, stroke infection and blood clots formation are some of the complications of Valvular heart replacement procedure. Among all the complications the most important one is thrombotic event. Thrombotic event can cause stroke when it block the supply of the blood to the brain can lead to death<sup>(10)</sup>.

There are certain ways used to reduce the complications of MHVR in which the most important one is the use of oral anticoagulant therapy (warfarin). Oral

anticoagulant (OAC) are postoperative therapy, used to overcome the occurrence of thrombosis<sup>(11)</sup>. Anticoagulant treatment is standard therapy in post heart valve replaced patients. OAT prevents formation of thrombosis and also prevents the occurrence of stroke. Among oral anticoagulants warfarin is the best medicine used for heart valve replaced patients<sup>(12)</sup>.

OAT increases the life expectancy of post-operative heart valve replacement patients. These medications can be used for life long with very low side effects if the patients observe PT/INR in therapeutic range. PT/INR above the normal range may lead to severe bleeding and thrombosis<sup>(13)</sup>.

Only patients can monitor PT/INR themselves for any complication of oral anticoagulant therapy (OAT) Warfarin. Meanwhile it is very important for patients to know about OAT for optimal health. Patients Nurses should educate the patients about OAT. Low patient's knowledge may lead to sever problems. One side warfarin prevent clots formation while another side it causes thrombosis<sup>(14)</sup>.

No study was found in Pakistan on “Knowledge regarding oral anticoagulant therapy among patient with mechanical heart valve replacement” (MHVR). This paper will discuss methods used to systematically search, retrieve and appraise evidence on Knowledge regarding oral anticoagulant therapy among patient with (MHVR). Studies included in the review were presented comprehensive evidence on Knowledge regarding OAT among patient with mechanical heart valve replacement.

### **Subjects and Methods**

A descriptive cross-sectional study on patients with mechanical valve prostheses was conducted at Lady Reading Hospital Peshawar, Khyber Pakhtunkhwa, Pakistan. The duration of the study was 6 months, starting from February 2019 to August 2019.

With 95% confidence level, margin of error of 5% and population proportion of 66% the sample size for the study was 345 subjects. Consecutive sampling technique has been used. Study was conducted after approval of ASRB and ethical review board of KMU.

Data was collected using adopted Oral Anticoagulant Knowledge test (OAK) questionnaire from post-operative mechanical heart valve replacement patients. The questionnaire was standard and validated (Cronbach's alpha = 0.767). The questionnaire was translated to Urdu and the content validity index calculated was 0.93 with five expert's opinion of Government College and cardiovascular surgeons of Lady Reading Hospital Peshawar.

Knowledge of participants regarding oral anticoagulant therapy was recorded as inadequate, moderate adequate and adequate knowledge. Data was analyzed using SPSS 24.

**Results**

Table 1: Demographic Profile of the study population, (n=345).

	Frequency	Percent	Valid Percent	Cumulative Percent
<b>Gender</b>				
Male	205	59.4	59.4	59.4
Female	140	40.6	40.6	100.0
<b>Age (Years)</b>				
< than 20 years	4	1.2	1.2	1.2
21 -30 years	70	20.3	20.3	21.4
31-40 years	158	45.8	45.8	67.2
40-50 years	93	27.0	27.0	94.2
> than 50 years	20	5.8	5.8	100.0
<b>Social Status</b>				

A total of 345 post-operative mechanical heart valve replacement patients who were on warfarin therapy were included in the study. The age of the participants ranged from 19 to 62 years. Mean age of the participants was 37.91 years. Nearly half (46%) of the study participants were in range of 31-40 years, followed by 40-50% which is 27%. More than half (59%) study participants were male while 41% participants were female. The huge numbers (n=299) of post-operative prosthetic valve patients were married. More than half (58%) participants were using warfarin therapy for less than three years. Mitral valve was the most affected heart valve of the study participants reported by 62% participants. Similarly, Aortic heart valve replacement was reported by 21% participants. Both Mitral and Aortic valve were replaced in 15% of study population. Majority (51%) study participants were having primary level of education; only 4% participants were having master level of education (Table 1).

Married	299	86.7	86.7	86.7
Unmarried	45	13.0	13.0	99.7
Divorced	1	0.3	0.3	100.0
<b>Duration of Warfarin Therapy (Years)</b>				
< than 3 years	202	58.6	58.6	58.6
4-7 years	60	17.4	17.4	75.9
8-10 years	59	17.1	17.1	93.0
> than 10 years	24	7.0	7.0	100.0
<b>Prosthesis Position</b>				
Mitral	215	62.3	62.3	62.3
Aortic	75	21.7	21.7	84.1
Mitral and Aortic	55	15.9	15.9	100.0
<b>Education</b>				
Primary	176	51.0	51.0	51.0
Matric	105	30.4	30.4	81.4
FA/FSC	49	14.2	14.2	95.7
Master	15	4.3	4.3	100.0

Table 2: Knowledge on oral anticoagulation therapy among valve replacement patients (N=345).

Level of Knowledge	Number	Percentage
Inadequate Knowledge (< than 50%)	270	78.3%
Adequate Knowledge (50 – 75%)	57	16.5%
Adequate Moderately Knowledge (> than 75%)	18	5.2%

Majority (78.3%) mechanical heart valve replacement patients had inadequate knowledge, 16.5% participants have adequate knowledge and only 5.2% respondents have moderately adequate knowledge regarding oral anticoagulant therapy (Table 2).

There was no significant association between the socio-demographic variables and level of knowledge of participants regarding oral anticoagulant therapy.

### Discussion

Many studies have been conducted in different countries to evaluate the knowledge of post-operative mechanical valve replaced patients regarding oral anticoagulants therapy (OAT) but no study has been conducted in Pakistan regarding this issue.

The main purpose of the study was to determine the knowledge regarding OAT (warfarin) therapy among patients with mechanical heart valve replacement (MHVR). Overall, 20 questions regarding the knowledge were included in the study. The present study discovered that majority of the study participants 78.3% had inadequate overall knowledge score. However, the results of the other studies evidenced moderate knowledge level of majority (66.7%) participants with mechanical valve replaced regarding OAT<sup>(15)</sup>. Similarly, another study also reported (61.8%) moderate knowledge in patients with MHVR regarding OAT<sup>(16)</sup>.

In addition, the results of the current study showed majority (196) of patients responded missing one dose of warfarin can alter the effectiveness of OAT. Literature supports, that missing one dose of warfarin may alter the effectiveness of OAT. It is necessary for patients to take tablet warfarin on regular bases because missing dose can alter the normal range of PT/INR<sup>(17)</sup>. One other study also estimated, if patient misses a single dose of warfarin and if they remember the dose on the same day, so, it is permissible to take the missing dose on the same day, but if they remember it on the next day so they should not take the missing dose because it can overdose the patient. The patient should consult the physician regarding the missing dose<sup>(16),(17)</sup>.

The current study revealed that 70% participants reported that they identify warfarin tablets by color. Literature also

supports that the best way to distinguish between different strengths of warfarin is color distribution<sup>(18)</sup>.

Furthermore, recent study showed (58%) of the MHV patients reported that eating green leafy vegetables with warfarin therapy increase the risk of thrombosis. 13% participants respond that eating green leafy vegetables reduce the effectiveness of warfarin. Similarly, the current findings indicate that majority (55%) of respondent reported that vitamin A interacts with warfarin and only 18% participants answered the correctly that vitamin K interacts with warfarin. According to literature vitamin K is the most important vitamin which interacts with warfarin. It is recommended for the MHVR patients to avoid eating green leafy vegetables to maintain INR in normal range<sup>(19)</sup>. Similarly, the findings were reported by the study majority of the patients had low knowledge about the influence of diet on OAT<sup>(20)</sup>.

The current study showed very few patients (15%) answered correctly about the situation in which they should contact the primary physician, while other study showed 66% patients answered correctly regarding contact with primary physician while on OAT<sup>(21)</sup>.

In the existing study more than half (58%) of the patients with MHV gave correct answer about PT/INR test. The patients responded that the PT/INR is a blood test used to monitor warfarin therapy. In the same perspective, studies reported majority of the patients responded that PT/INR is a test for monitoring the OAT<sup>(22)</sup>. In the same way, literature also supports that PT/INR is a test for the patients used OAT. PT/INR monitors the level of warfarin and indicate the dose adjustment accordingly<sup>(23)</sup>.

Majority (84%) of the participants from the recent study reported that warfarin may be used to treat patients that already have a blood clot, while 39% reported that PT/INR is a blood test that is rarely done while on warfarin. Similarly, patients with MHVR from other

studies also supports result of this study's that (warfarin) are used in patients who have already a blood clot<sup>(24)</sup>.

In addition, results from this study highlighted that one forth (25%) of patients with MHVR reported the correct answer that PT/INR value below the normal range increase the risk of clot, while 67% reported that it increase the risk of bleeding of patients whose PT/INR is below the normal range. Meanwhile others study showed, majority of the patients know that PT/INR bellow the normal range increase the risk of having a blood clot<sup>(25)</sup>.

Only 10% of patients with MHVR from the current study gave correct answer that medicines containing aspirin and non-steroidal anti-inflammatory drugs (NSAID) may increase risk of bleeding while on warfarin, likewise majority (82%) participants reported that NSAID reduce the effectiveness of the warfarin. In same context, results from the other study showed majority of patients with MHVR reported the correct answer that aspirin and NSAID may increase the risk of bleeding in patients with warfarin<sup>(26)</sup>.

Less than quarter of the patients from the current study with MHVR reported the correct answer regarding the importance of monitoring of signs of bleeding while on warfarin therapy. Majority (79%) responded with the wrong answer reported that the patients on warfarin therapy should only monitor sign of bleeding when their PT/INR is above the normal range. In the same context, results from other studies showed majority patients have knowledge regarding the importance of monitoring sign of bleeding while on warfarin therapy<sup>(27)</sup>.

There are some contradictions between the results of the current study as compared to other studies. Present study reported only 10% patients with MHVR have received adequate education about OAT which is very low percentage; while studies reviewed above reported majority of the participants received anticoagulant

education. Education regarding anticoagulant has a very strong association with patient's knowledge.

### **Conclusion**

The majority of studied patients had overall inadequate knowledge regarding OAT at the same time they had inadequate knowledge about diet, therapeutic level and preventive measures of complications. Since the patients had less knowledge on effective dietary management and drug compliance will increase the complications relates to warfarin. Area of improvement in patient's education has been identified. There is need of strategies to improve the patient's knowledge regarding oral anticoagulant to minimize the risk of therapy.

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