Research Article

Arteriovenous Fistula (AVF) Self-Care: A Study at a Tertiary Care Hospital in Lahore, Pakistan

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Abstract | Most complications associated with the use of arteriovenous fistula (AVF) access site for hemodialysis can be prevented by adopting a daily self-care plan for AVF access site. Therefore, the aim of this study was set to assess the knowledge, attitude and practice (KAP) about self-care of AVF access site amongst end stage renal disease (ESRD) patients who are on maintenance hemodialysis.

Methods: This comparative cross sectional study with quantitative approach was carried out in hemodialysis unit of Shalamar Institute of Health Sciences, Lahore for the month of July, 2017. All patients with ESRD, on maintenance hemodialysis through an AVF access for at least last 30 days, were included in the study. Each patient was given a questionnaire comprising of 21 questions during his/her routine dialysis. Knowledge of ESRD patients was categorized into poor (<50%), average (50-70%) and good (> 70%).

Results: Out of 138 patients, 94% had good knowledge about AVF self-care and 99% had good attitude about AVF access care. However a few practices like daily AVF thrill checkup, pre-hemodialysis AVF site washing and pre and post hemodialysis disinfection were not in correspondence with the level of knowledge representing a discrepancy between knowledge and practice in some aspects of the of the AVF care. Knowledge scores when compared between different age groups, greater proportion of patients between age of 45-65 ($p<0.017$) possessed good knowledge as compared to age groups of 25-45, 65-85 years.

Conclusion: Despite good understanding and adequate attitude, few practices were not being followed in parallel to the knowledge acquisition. Therefore, regular reminder and periodic evaluation of practical aspects of AVF care is recommended for each ESRD patient visiting for hemodialysis.

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Introduction

The burden of chronic kidney disease (CKD) in the form of incidence or prevalence in Pakistan is unknown due to lack of national registry [(1)]. We could only find scattered data from local kidney centers of different hospitals. However, the prevalence of CKD rather than end stage renal disease (ESRD) is known and reported to be around 25% among healthy and asymptomatic adult population in a study from Ka-

rachi [2]. The annual incidence of ESRD in Pakistan is expected to be even higher than reported in developed worlds [1, 3].

Hemodialysis is the most common and durable treatment for ESRD pateints [4]. However, this changes patient's life completely by imposing certain constrains on their routine activities affecting the compliance to therapy so usually they need assistance to continue treatment [5].

A proper vascular access is the key for effective hemodialysis. A definite access in the form of arteriovenous fistula (AVF) is recommended in CKD patients [6]. The AVF provides adequate flow for dialysis and has fewer complications as compared to double lumen catheter. AVF access is long term and requires fewer interventions for hemodialysis [4].

However, there are still several complications associated with the use of AVF access site like infection, thrombosis, aneurysms, hand ischemia, cardiac overload and hand edema etc.[7]. These complications can be prevented by adopting a daily AVF self-care plan. [8] For this health care team is supposed to educate them about self-care and management of AVF [9].

Initially when AVF is being matured, focus is more towards its durability. Accordingly patients are instructed to avoid wearing tight dressings, checking blood flow daily and doing manual compression exercises etc. In addition to this when AVF is matured and is being used for hemodialysis, additional care is needed like pre dialysis cleansing of AVF access site, adequate compression for hemostasis after dialysis, not checking blood pressure and avoiding blood sampling from that hand etc. [10].

Adequate knowledge of all these potential complications make preventive measures necessary for ESRD patients as it will form an attitude and will lead to the practice of good AVF self-care [11]. Failure to follow these precautionary measures may lead to hospitalization [12]. Since ESRD patients on maintenance hemodialysis are at increased risk of complications hence it is important to find out their knowledge, attitude and practice towards self-care of AVF access site. [13]

Since this important aspect of AVF self-care has not been studied widely in Pakistan, we decided to assess the adequacy level of knowledge attitude and practice (KAP) of this target population in hemodialysis unit of Shalamar Hospital Lahore, which is a tertiary care setup, serving around 200 ESRD patients requiring regular hemodialysis. Furthermore, we may also get an insight into the discrepancies and limitations involved in adequate education of ESRD patients about AVF care so that appropriate measures can be taken to improve the longevity of AVF access and hence patient's quality of life. This study can also help in conducting further research to better understand the lapses in AVF self-care and to formulate a better attitude of patients toward AVF self-care.

Methods

This Comparative cross sectional study, with quantitative approach for assessing knowledge, attitude and practice (KAP) towards AVF self-care [14], was conducted in hemodialysis unit of Shalamar Hospital Lahore, over a period of one month from 1st to 31st July 2017. The sample size of 100 patients was estimated by using 95% confidence level, 3% absolute precision with expected percentage of patients having inadequate knowledge as 97.7% [15].

The target population included in the study was of adult ESRD patients (>18 years) on maintenance hemodialysis through a permanent AVF access for at least last 30 days [14]. Patients meeting inclusion criteria but drowsy or unconscious at the time of data collection or with any neurologic or psychiatric disorders, unable to self-care or provide answers to questionnaire were excluded from the study[16].

This study was approved from hospital ethical committee and after taking written informed consent a questionnaire comprising 21 questions was answered by patients. This questionnaire was mainly based on the guidelines given by National Kidney Foundation Kidney Disease Outcome Quality Initiative (NKF KDOQI) guidelines for hemodialysis access. [17] These guidelines are open access document and has been used in many studies questionnaires. Our study questionnaire was also validated locally by two consultants in a pilot study (Annexure 1).

Due to lack of similar studies study author defined knowledge as "good knowledge", "average knowledge" and "poor knowledge" based on correct answers score of > 7, 5-7 and <5. An "adequate attitude" means good intent of fistula self-care both at home and during

dialysis. Lack of intent of fistula self-care or a lack of belief of beneficial nature of self-care was defined as "inadequate attitude". Practices are classified as "never practiced", "occasionally practicing" and "always practicing".

All the data was analyzed by SPSS-23. The quantitative variables like age were presented as mean ± SD. The qualitative variable like age was presented as frequency and percentages. Chi Square test was applied to deduce the association between knowledge, attitude and practice related to AVF self-care. The p value of ≤0.05 was considered as significant.

Results

The socioeconomic demographics of 138 study participants show that both genders were represented equally in study, 50.7% were male and 49.3% were female. The mean age of all the participants was 50.45±12.29 years, ranging from 24 to 82 years. Most of the patients had history of chronic medical conditions like hypertension (89.1%), diabetes mellitus (46.4%), hepatitis C (31.2%) chronic glomerulonephritis (23.9%) and ischemic heart disease (21%). Most participants were getting dialysis twice a week (71.7%) and rest thrice a week (27.5%) while only one participant was getting dialysis once a week (0.7%). Regarding educational status, 25.4% were uneducated (Table 1).

The analysis of patients' knowledge regarding AVF self-care showed that most of the patients (89.9%) had good knowledge while 9.4% had adequate knowledge and only 0.7% had poor knowledge (Table 2). They knew why they needed AVF (99.3%) and why it is better than double lumen catheter (99.3%). However, some patients didn't know that they should not be wearing constrictive clothing around the area of fistula (12.3%), not to sleep over AVF access arm (10.1%) and washing AVF access site before hemodialysis (8.7%) (Table 3).

Patients on dialysis for <1 year, 1-3 year and >3 years had good knowledge acquisition represented as 95.5%, 89.5 & 88.2% respectively (Table 2). There is no significant correlation (p=0.65) of knowledge with the duration of dialysis contrary to our expectation.

When evaluating the attitude of the patients about AVF, 99.3% of the patients felt the need to take care of fistula site at home and during dialysis. 97.8% of patients agreed that fistula self-care is beneficial for them (Table 3).

Amongst the "always practicing" category of practices that got highest compliance are "AVF arm weight avoidance" and "AVF access site prick avoidance" (94.9% each) followed by "AVF care during hemodialysis" (92.8%). Almost more than two third of study population were persistent in their practices. On the other hand, the lowest compliance in terms of "never practicing" is equally observed in "asking for pre hemodialysis disinfection requests" and "avoiding

Table 1: *Demographic profile of AVF* self-care study patients*

Demographic characteristics	Total(n=138)
Age (years)	50.5±12.3
24 - 45	58 (42%)
46 - 65	64 (46.4%)
65 - 85	16 (11.6%)
Gender	
Male	70 (50.7%)
Female	68 (49.3%)
Other medical illnesses	
Diabetes Mellitus	64 (46.4%)
Hypertension	123 (89.1%)
Ischemic heart disease	29 (21.0%)
Chronic glomerulonephritis	33 (23.9%)
Blindness	1 (0.7%)
Unilateral Kidney	1 (0.7%)
Hepatitis C	43 (31.2%)
Hepatitis B	2 (1.4%)
Autosomal dominant polycystic kidney disease	5 (3.6%)
Nephrolithiasis	2 (1.4%)
Pulmonary tuberculosis	1 (0.7%)
Pregnancy induced acute kidney injury	2 (1.4%)
Systemic Lupus erythematosus	1 (0.7%)
Asthma	1 (0.7%)
Hemodialysis frequency	
Twice per week	99 (71.7%)
Thrice per week	38 (27.5%)
Once per week	1 (0.7%)
Educational status	
Uneducated	35 (25.4%)
Educated	103 (74.6%)

*Values in parenthesis are percentages; *AVF= arteriovenous fistula; Plus minus values are mean ± SD.*

tight wearing on AVF access site". The practice of "avoiding tight wearing" is also the overall most neglected practice (Table 4).

In most aspects a high frequency of practice was observed in line with the adequate knowledge. For instance 92.8% people know about avoiding weight on AVF arm and 94.9% practiced weight avoidance. However, in a few aspects of AVF self-care patients didn't follow the practices despite having adequate knowledge. For example, 94.9% patients knew about daily thrill checkup but only 77.5% practiced this. This was also seen with disinfection needs where 94.6% patients knew about AVF pre & post hemodialysis disinfection, however only 76.8% practiced it. In the same way 91.3% knew about washing AVF site before dialysis but only 81.2% patients followed this.

Table 2: *Patients knowledge score distribution according to age, gender and dialysis duration*

		Knowledge			Total	P value
		Poor knowledge (Score ≤ 4) n(%)	Adequate knowledge (Score 5 - 7)n(%)	Good knowledge (Score 8-10) n(%)		
Age (years)	24 – 45	0 (0)	9 (15.5)	49 (84.5)	58 (100)	
	46 – 65	0 (0)	3 (4.7)	61 (95.3)	64 (100)	P= .017
	65 – 85	1 (6.3)	1 (6.3)	14 (87.5)	16 (100)	
Gender	Male	0 (0)	5 (7.1)	65 (92.9)	70 (100)	
	Female	1 (1.5)	8 (11.8)	59 (86.8)	68 (100)	P= .376
Dialysis duration (years)	< 1	0 (0)	1 (4.5)	21 (95.5)	22 (100)	
	1 – 3	0 (0)	6 (10.5)	51 (89.5)	57 (100)	P = .629
	> 3	1 (1.7)	6 (10.2)	52 (88.1)	59 (100)	
Total		1 (0.7)	13 (9.4)	124 (89.9)	138 (100)	9.4 ± 1.3

Values in parenthesis are percentages; Plus minus values are mean ± SD.

Table 3: *Frequency of knowledge and attitude related questions in AVF* self-care study patients*

Knowledge about AVF self-care			
No.	**Questions**	**Answers**	
		Yes / patient knows	No / patient does not know
1	What was the need to make AVF access?	137 (99.3)	1 (0.7)
2	What is the benefit of AVF access over dialysis catheter?	137 (99.3)	1 (0.7)
3	Are you aware to check pulse / thrill of your AVF site daily?	131 (94.9)	7 (5.1)
4	Are you aware to avoid sleeping over AVF access site?	124 (89.9)	14 (10.1)
5	Are you aware to avoid lifting excessive weight from AVF site?	128 (92.8)	10 (7.2)
6	Are you aware to avoid wearing tight cloths, watch or jewelry etc. on AVF access site?	121 (87.7)	17 (12.3)
7	Are you aware to wash your AVF site before dialysis?	126 (91.3)	12 (8.7)
8	Are you aware to avoid getting a prick at AVF site√ apart from that needed for hemodialysis access?	127 (92.0)	11 (8.0)
9	Are you aware to avoid performing BP measurements on AVF site?	130 (94.2)	8 (5.8)
10	Are you aware of AVF access site cleansing / disinfection before and after dialysis treatment?	130 (94.2)	8 (5.8)
Attitude about AVF self-care			
No.	Questions	Answers	
		Yes	No
1	Do you feel motivated for AVF self-care at home and during hemodialysis?	137 (99.3)	1 (0.7)
2	Do you feel that AVF self-care can be beneficial?	135 (97.8)	3 (2.2)

*Values in parenthesis are percentages; *AVF= arteriovenous fistula; √ For sampling or medicines infusions etc.*

Table 4: *Frequency of different practices in AVF* self-care study patients*

No.	AVF self-care practices	Always practicing	Occasionally practicing	Never practicing
		n(%)	*n*(%)	*n*(%)
1	Daily AVF thrill checkup	107 (77.5)	30 (21.7)	1 (0.7)
2	Daily AVF washing	112 (81.2)	25 (18.1)	1 (0.7)
3	Avoiding sleep over AVF access site	123 (89.1)	11 (8.0)	4 (2.9)
4	Weight lifting avoidance from AVF access site	131 (94.9)	5 (3.6)	2 (1.4)
5	Avoiding tight wearings÷ on AVF access site	123 (89.1)	7 (5.1)	8 (5.8)
6	Following AVF care instructions during dialysis	128 (92.8)	8 (5.8)	2 (1.4)
7	Pre dialysis AVF cleansing§	115 (83.3)	19 (13.8)	4 (2.9)
8	Pre and post dialysis disinfection	106 (76.8)	24 (17.4)	8 (5.8)
9	AVF access site prick√ avoidance	131 (94.9)	2 (1.4)	5 (3.6)

*Values in parenthesis are percentages; *AVF= arteriovenous fistula; ÷Tight wearings include tight cloths, watch or jewelry etc; § Cleansing of AVF access arm with soap and water before dialysis; √For sampling or medicines infusions etc.*

When knowledge scores were compared between different age groups (24-45 years, 46-65 years, 66-85 years), we found that 46-65 years old group has significantly greater proportion of patients possessing good knowledge as compared to those in 24-45 and 65-85 years old groups (p=0.017). However such a difference was not observed when knowledge scores were compared between gender (p=0.376) or patients undergoing different duration of dialysis (p=0.629) (Table 2).

Discussion

In general, the appropriate acquisition of knowledge of precautions in relation to get a particular treatment is critical for patients as it helps them to take necessary measures to prevent adversaries that might affect them [18]. When someone is getting a specialized & long term treatment like hemodialysis through an AVF access site with the intent to get no harm, knowledge plays a vital role in success of treatment and prevention of complications [19].

In our study we found that the overall knowledge was adequate between all age groups and significantly better in age group of 46-65 years. In different cultures the knowledge differs amongst different age groups when surveys are underwent regarding health care practices and in our setup we found this at the age of 46-65 years. [20]

We think that such a high level of acquisition of knowledge in the context of a tertiary care facility correlates with the increased interaction between patient and different qualified health care providers at least twice a week during each dialysis session. This might not be the scenario in a non-urban or distant health care facility where availability of a skillful staff or health care provider might not be fully ensured at all times. Moreover, we are not sure if same level of knowledge is prevalent in other ESRD patients coming from non urban settings who are getting hemodialysis from non-tertiary care settings. It is likely that results in less developed areas might be different where number of patients having inadequate knowledge might be higher than reported here. To analyze this we could not find any similar KAP study amongst ESRD patients done at non tertiary care setting.

Furthermore as shown in Table 2 there is no significant correlation (p=0.65) of knowledge with the duration of dialysis contrary to our expectation. One possible reason can be lack of repetition of relevant information related to AVF self-care from health care providers. Therefore, we suggest that patient should be informed about AVF care on every visit verbally and by brochures.

In our study attitude meant the way patient think about the care of their AVF. We found the attitude to be adequate towards self-care of fistula.In the presence of good knowledge and attitude one must expect a good practicing behavior. The practice in this case meant to take actions for caring the fistula.

The results showed that despite adequate knowledge and good attitude our patients were reluctant to follow and practice the real essence of the knowledge in some particular areas. This avoidance behavior was particularly observed in daily thrill checkup of AVF

access site, pre and post dialysis AVF cleansing and disinfection. The reason to this behavior is not studied here but it could be multi factorial ranging from some patient factors like low confidence on self-checkup to environmental factors like lack of appropriate infection control facilities in the health care settings and the lack of effective communication between patient and health care providers [21].

Authors are convinced to build practice based methods of transmitting knowledge. For example, in hospital settings patients should be asked to wash their AVF access site before hemodialysis possibly under the supervision of a health care staff [22]. By doing such interventions in each dialysis session most patients will start following the guidelines given to them. Other patients will also look at this and will be more likely to practice it.

Moreover for homecare the physician should actively ask on every visit whether patient has been following the guidelines given to him or not. This will enhance compliance of patients towards AVF self-care at home. [23,24]

Conclusion

This study concluded that patients from a tertiary care setting in Lahore have good understanding and adequate attitude towards self-care of AVF access site. Though most of the practices were adequately followed and in line with the good knowledge yet some discrepancy is noted in a few practices like daily AVF thrill checkup, pre-hemodialysis washing and disinfection. Therefore, regular reminders and periodic evaluation by health care workers for practical aspects of AVF care is recommended for each ESRD patient visiting for hemodialysis.

Author's Contribution

Naveed Rashid and Muhammad Aamer: Conceived the idea, data collection, manuscript writing, critical review

Uzma Malik and Muhammad Waqar Akram: Statistical analysis, manuscript writing and critical review of article

Nimra Arif: Data collection, literature search, manuscript writing

Ayesha Irshad: Manuscript writing and critical review of article

Supplementary Material

There is supplementary material associated with this article. Access the material online at: https://doi.org/10.21649/akemu.v24i1.2344

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