

Assessment of knowledge, attitudes and practices (KAP) on arterio-venous fistula (AVF) care among end stage renal disease (ESRD) patients on hemodialysis-study in Uva province, Sri Lanka

W.D.M.G. Amarasinghe¹, K.M.B. Pabodha¹, M.H.W.M.N. Wijayapala², E.M.K.G.H.B.K. Ekanayaka³, J.M.M.U. Jayasinghe⁴, D.U.S. Ratnapala¹

¹Provincial General Hospital, Badulla, Sri Lanka

²Ministry of Health, Sri Lanka

³Base Hospital, Mahiyanganaya, Sri Lanka

⁴Distric General Hospital, Monaragala, Sri Lanka

⁴Colombo South Teaching Hospital, Sri Lanka

Keywords

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Introduction

End stage renal disease is an emerging public health burden in Sri Lanka. However, ESRD has been underreported due to the deficiency of reliable epidemiological studies in Sri Lanka.

Among the treatment modalities, hemodialysis is the most acknowledged and practiced management worldwide.¹ A good vascular access is the crucial factor for efficient hemodialysis.² Arteriovenous fistula (AVF) is a key mode of renal replacement therapy in ESRD patients as a permanent definite access.² Compared to other vascular accesses such as arteriovenous grafts and central venous catheters, AVF has lengthier patency rate, less complications, is associated with less mortality and is economical according to Foundation Kidney Disease Outcome Quality Initiative (KDOQI) guidelines.³

Despite being considered as the best access for dialysis, AVF can result in several complications like thrombosis, infection, stenosis, aneurysmal dilatation, steal phenomenon and cardiac overload.¹ In order to avoid them, proper care of AVF is required by health care team and ESRD patients.¹

Patients' knowledge, attitudes and practices (KAP) play a key role in minimizing complications and hospitalization due to AVF.⁴ Vascular access guidelines mention that patients should be provided with adequate knowledge regarding AVF

selfcare.¹ Patients should adhere to acceptable self-care behaviors with their AVFs in order to preserve it in its finest condition.⁵

Elevation of the arm, avoidance of tight circumferential dressings, assessment of AVF function daily and performance of manual compression exercises are the key factors to be highlighted during the period of maturation of AVF to provide greater fistula durability. Furthermore, venous infusions and blood pressure measurement of AVF arm should also be discouraged.⁵ Understanding of this is crucial in order to minimize AVF related complications and to increase the durability.⁵

As this vital aspect of AVF self-care has not been researched broadly in Sri Lanka, particularly in Uva province we planned to evaluate the adequacy level of KAP on ESRD patients on hemodialysis for better understanding the lapses in AVF self-care and to build a better outlook of patients towards AVF self-care.

We decided to carry out this research in Uva province, Sri Lanka because it accommodates approximately 3600 patients of chronic kidney disease of which about 9% are on renal replacement therapy primarily cared at satellite renal clinics centered around Nephrology unit, DGH Badulla.⁶ Every year 600 patients will be diagnosed with new onset chronic kidney disease.⁶

This research will also provide support for the expansion of future educational policies which would change patient's attitude towards achievement of necessary care.

Research methodology

Setting and study design

The research is a descriptive cross sectional prospective study

Correspondence: W.D.M.G. Amarasinghe

E-mail: pharmalaka@gmail.com

 <https://orcid.org/0000-0003-3868-0489>

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conducted at the Nephrology unit, Uva province, Sri Lanka. All patients with ESRD who were on longterm hemodialysis through a permanent AVF access for a minimum of 30 days, coming to the Nephrology unit from 01st January 2021 to 31st January 2021 were enrolled in the survey. Patients who could not provide answers to questionnaire at the time of data collection due to drowsiness or confusion and patients who were unable to self-care were excluded from the study.

Study instrument

A structured questionnaire was designed to study the KAP on AVF care among ESRD patients on hemodialysis. Questions of the study tool were formulated on the basis of literature review and after interviewing the ESRD patients coming for hemodialysis. Questionnaire was pre validated by a pilot study. The questionnaire was divided in to four parts, which consist of patient's demographics (Part A), knowledge (Part B), attitude (Part C) and practices (Part D). The questionnaire consisted of 31 well-structured questions. These questionnaires were translated into the Sinhala and Tamil (local languages) for the better understanding of the ESRD patients.

Data collection

Ethical clearance was obtained from the Ethics review committee, Faculty of Medicine, University of Colombo prior to the study (EC-21-004).

Patient's informed written consent was taken, and each patient was assessed via an interviewer-administered questionnaire consisting of 31 questions during his/her routine dialysis with minimum interference in the treatment. This was carried out at the patient waiting area near the hemodialysis unit 30 minutes prior to the commencement of hemodialysis. Filled questionnaires were collected for analysis. Confidentiality of the patient and the records were always maintained. The analytic sample consisted of 160 questionnaires.

Data analysis

The data was analyzed using SPSS software version 26.0. Percentages were calculated to describe the demographic factors of the sample population. The level of knowledge, attitudes and practices were analyzed separately using percentages.

Knowledge was categorized into poor (<50%), average (50-70%) and good (> 70%) according to the percentage of the knowledge.

Attitudes were considered adequate when the patient describes that AVF self-care is beneficial and that he feels motivated and is ready to perform such care. In other words,

patient should answer all 3 key questions on attitudes correctly (100%), to be considered adequate.

Attitudes were taken as inadequate when the patient did not consider AVF self-care is beneficial or when he did not feel motivated to perform the required care or when he was not willing to perform it. Less than 100% of attitude was considered inadequate

Practices were considered adequate when at least, 75% of the practices were executed always.

Chi square test was used to compare the relationship between patient's demographic factors (age, sex, education level, duration of dialysis) and their level of knowledge, attitudes and practices. p value <0.05 was considered statistically significant.

Results

The sociodemographic characteristics of the 160 study population showed a male predominance of 76.3%. Almost half of the study population (50.6%) were in the age group of 40-59 years. Regarding education, 62.5% had either secondary or higher education.(Table 1)

Table 1 –Demographic profile of the study population

Socio-demographic characteristics	Total(n=160)
Age group	
20-39 years	33(20.6%)
40-59 years	81(50.6%)
>60 years	46(28.8%)
Gender	
Male	122(76.3%)
Female	38(23.8%)
Level of education	
None	6(3.8%)
Primary education	54(33.8%)
Secondary education	95(59.4%)
Graduate/ Postgraduate	5(3.1%)

Majority of patients (79.4%) in the research study had past medical history of hypertension. Diabetes mellitus was a comorbidity in 28.1% whereas, 12.5% had no previous comorbidities.

Nearly two thirds of the respondents had haemodialysis for more than one year. Most participants received haemodialysis twice a week (95%) and rest one or three times per week. Chronic kidney disease of unknown origin was the cause for ESRD in half of the patients. Approximately one third of the patients has got either diabetes mellitus or hypertension or both as the cause for ESRD.(Table 2)

Table 2: Medical characteristics of the study population

Medical characteristics	Total(n=160)
Medical background	
Diabetes mellitus (DM)	3(1.9%)
Hypertension (HTN)	70(43.8%)
Ischaemic heart disease (IHD)	10(6.3%)
HTN & IHD	15(9.4%)
DM & HTN	29(18.1%)
DM, HTN, IHD	13(8.1%)
None	20(12.5%)
Duration of haemodialysis	
< 1year	55(34.4%)
1-3 years	78(48.8%)
>3 years	27(16.9%)
Frequency of haemodialysis	
Once a week	3(1.9%)
Twice a week	152(95%)
Thrice a week	5(3.1%)
Previous experience of CV access for haemodialysis	
Yes	134(83.8%)
No	26(16.3%)
Aetiology for ESRD	
DM	28(17.5%)
HTN	27(16.9%)
DM & HTN	1(0.6%)
Glomerulonephritis	8(5%)
Reflux nephropathy	6(3.8%)
Congenital	2(1.3%)
Vasculitis	1(0.6%)
Sepsis	7(4.4%)
Unknown(CKDU)	80(50%)

The evaluation of patients' knowledge involving AVF self-care demonstrated that majority of the patients (88.1%) had good knowledge while 11.9% had average knowledge and none had poor knowledge.(Table 3)

Table 3: Evaluation of KAP among the study population

	Poor(Percentage)	Average(Percentage)	Good(Percentage)
Knowledge	0	19(11.9)	141(88.1)
	Inadequate(Percentage)	Adequate(Percentage)	
Attitudes	4(2.5)	156(97.5)	
	Inadequate(Percentage)	Adequate(Percentage)	
Practices	8(5)	152(95)	

All the patients knew why they needed AVF. A total of 134 patients(83.8%) had experience of a central venous catheter(CVC) for haemodialysis either as temporary or as tunneled line. Although 92.5% and 88.1% of respondents knew that less infection and high durability are benefits of AVF over CVC respectively, only 11.9% were aware that less thrombosis is also another benefit.

The assessment of patient's knowledge about fistula care revealed that 74.4% of the patients knew that arm should be kept straight while AVF is healing. Nearly one fifth (21.9%) of the patients did not know that AVF could not be used then and there after creation and 13.1% were not aware that at least 1 month of maturation time is needed after creation of AVF to begin haemodialysis. Significant deficiency of knowledge (78.1%) on needing to elevate the arm after creating AVF was observed. Moreover, still about the knowledge, it was identified that 30% of the study population did not know that they should feel the AVF thrill daily as surveillance.

However, some patients didn't realize the importance of not wearing tight garments around the area of fistula (15%), not holding heavy weights on access arm (6.9%) and not sleeping over AVF access arm (8.1%). Majority was knowledgeable to avoid checking blood pressure (98.1%) and drawing blood from access arm (95%).

Most respondents knew to seek medical advice when AVF site shows signs of inflammation (92.5%), bleeding (94.4%), in the absence of thrill/pulse (91.3%) and in the presence of ischemic features on access arm (93.8%).(Table 4)

Overall, our study population had a positive attitude towards AVF. Nearly all patients (99.4%) granted that fistula self-care is useful for them and 98.8% of the patients felt motivated and prepared to look after their fistula site.(Table 3)

Majority (95%) showed adequate practices towards AVF self-care. Amongst the “always practicing” category of practices that found greatest compliance are AVF access site prick avoidance (100%)”, “pre dialysis AVF cleaning (97.5%)” followed by “avoidance of tight clothes around AVF (95.6%)”. Daily AVF thrill checkup (65.6%) is the most neglected practice among the respondents.(Table 4)

In most aspects a high level of practice was reflected in keeping with the adequate knowledge. For example, 93.1% of people knew to avoid weight on AVF arm and 94.4% exercised weight avoidance. In some cases, less frequency of practice was detected along with less knowledge. For instance, only 70% people know the importance of daily AVF thrill check and only 65.6% practiced it.(Table 4)

Table 4: Patients' responses for the questions to assess their knowledge, attitudes and practices

Knowledge about AVF self care	Correct answer(Percentage)	Wrong answer/ Don't know (Percentage)
1.Why the AVF was created?	160(100)	0
2.What is the benefit of AVF over CVC (L infection)	148(92.5)	12(7.5)
3.What is the benefit of AVF over CVC (high durability)	141(88.1)	19(11.9)
4.What is the benefit of AVF over CVC (L thrombosis)	19(11.9)	141(88.1)
5.Do you need to keep your arm straight while AVF is healing?	119(74.4)	41(25.6)
6.Do you need to elevate your arm after creating AVF?	35(21.9)	125(78.1)
7.Can AVF be used then and there after creation?	125(78.1)	35(21.9)
8.Do you need to wait at least 1 month after creation to begin HD?	139(86.9)	21(13.1)
9.Do you need to do manual compression exercises to get the AVF matured?	156(97.5)	4(2.5)
10. Do you need to feel the thrill daily?	112(70)	48(30)
11.Can you wear tight cloths/ jewelry on access arm?	136(85)	24(15)
12.Can you carry heavy weights on access arm?	149(93.1)	11(6.9)
13.Can you sleep with your head on the access arm?	147(91.9)	13(8.1)
14.Can blood pressure be checked on access arm?	157(98.1)	3(1.9)
15.Can the blood be drawn from access arm?	152(95)	8(5)
16.Can you wash AVF once it's healed?	136(85)	24(15)
17.Do you need to go to hospital if AVF shows signs of inflammation?	148(92.5)	12(7.5)
18.Do you need to go to hospital if the AVF thrill/pulse can't be felt?	146(91.3)	14(8.7)
19.Do you need to go to hospital if AVF is bleeding?	151(94.4)	9(5.6)
20.Do you need to go to hospital if you feel cold, sensory motor deficit or discoloration on access arm?	150(93.8)	10(6.2)
Attitudes towards AVF self care	Yes	No
1.Do you think that AVF care is beneficial?	159(99.4)	1(0.6)
2.Do you feel motivated for fistula care?	158(98.8)	2(1.2)
3.Do you feel prepared for fistula care?	158(98.8)	2(1.2)
Practices on AVF self care	Always(Percentage)	Occasionally or never (Percentage)
1.Daily AVF thrill check up	105(65.6)	55(34.4)
2.Daily AVF washing	145(90.6)	15(9.4)
3.Avoid tight cloths/ jewelry on AVF site	153(95.6)	7(4.4)
4.Avoid weight lifting from the arm with AVF	151(94.4)	9(5.6)
5.Avoidance of sleep over AVF access arm	146(91.3)	14(8.7)
6.Pre dialysis AVF cleaning	156(97.5)	4(2.5)
7.Pre and post dialysis disinfection	142(88.8)	18(11.2)
8.AVF access site prick avoidance	160(100)	0

There was no statistically significant difference ($p < 0.05$) observed when knowledge scores were compared with age, gender, level of education, duration of dialysis. (Table 5)

Table 5: Patients' knowledge score distribution according to age, gender, education status and duration of haemodialysis”

		Knowledge			Total	p value
		Poor knowledge (<50%)	Average knowledge (50-70%)	Good knowledge (>70%)		
Age(years)	20-39	0(0)	2(6.1)	31(93.9)	33(100)	
	40-59	0(0)	10(12.3)	71(87.7)	81(100)	
	>60	0(0)	7(15.2)	39(84.8)	46(100)	P=0.811
Gender	Male	0(0)	12(9.8)	110(90.2)	122(100)	
	Female	0(0)	7(18.4)	31(81.6)	38(100)	P=0.276
Education	None	0(0)	2(33.3)	4(66.7)	6(100)	
	Primary	0(0)	6(11.1)	48(88.9)	54(100)	
	Secondary	0(0)	11(11.6)	84(88.4)	95(100)	
	Graduate/ Postgraduate	0(0)	0(0)	5(100)	5(100)	P=0.343
Duration of HD	<1year	0(0)	8(14.5)	47(85.5)	55(100)	
	1-3years	0(0)	8(10.3)	70(89.7)	78(100)	
	>3years	0(0)	3(11.1)	24(88.9)	27(100)	P=0.465

Discussion

When a patient is on specific long duration treatments like hemodialysis through an AVF access site, knowledge, attitudes and practices play an important role in treatment success and limitation of complications.

In this study investigator classified knowledge as “good knowledge”, “average knowledge” and “poor knowledge” depending on the knowledge score of $> 70\%$, $50\%-70\%$ and $<50\%$ respectively. According to these criteria majority (88.1%) found to have good knowledge whereas 11.9% had adequate and none had poor knowledge respectively. These results were comparable to the research conducted by Rashid et al.⁷ It is assumed that such a high level of understanding in patients at nephrology unit of Uva province (non-tertiary care setting) associates with the good communication between patient and various skilful health care providers at a minimum of two times per week during dialysis sessions.

Similar study conducted by Pessoa et al in Brazil reported that 97.7% had insufficient knowledge on AVF care.⁵ This difference could be due to the fact that in Brazil study 56.6% had incomplete primary education whereas in the current study only 37.6% had incomplete primary education.

Interestingly most patients knew when to seek medical advice for the complications of AVF such as infection, bleeding, ischaemia and absence of thrill. These factors were not assessed in other similar reviewed articles. High indices in the patients' knowledge on the complications of AVF was thought to be contributed by the effective patient awareness programme maintained by the health care providers. Early medical advice for above mentioned complications will invariably lead to early intervention and good outcome.

This study described feeling motivated, prepared and feeling beneficial of AVF self-care as adequate attitudes. Majority (97.5%) revealed positive attitudes towards AVF self-care in the current analysis. Similarly, Rashid et al and Iqbal et al showed positive attitudes towards AVF care in majority of the study population.^{7,1}

The AVF care practiced by ESRD patients was categorized as sufficient in 95% of population in this research study compared to 97.5% categorized as insufficient in Pessoa et al. The practice that got lowest compliance in the current study is daily AVF thrill checkup which is explainable by the study population less knowledge about the importance of daily AVF thrill checkup. It is recommended that this valuable aspect of care needs to be highlighted when educating the patients regarding AVF self-care. We believe that showing the method of checking the AVF thrill will enhance self-confidence of patients.

According to Rashid et al “high frequency of practice was observed consistent with the adequate knowledge”.⁷ The Brazil study highlighted that all patients with insufficient understanding also practiced an insufficient self-care of the AVF.⁵ Similar findings were observed in the current study. None of the patients in the current study showed malpractice despite having adequate knowledge about it. This again proves the importance of an awareness programme which will invariably improve the relevant practices.

Rashid et al concluded that “overall knowledge was acceptable among all age groups and significantly better in age group of 46-65 years”.⁷ Iqbal et al demonstrates significant differences in KAP of AVF care in both genders and different age groups.¹ Surprisingly current analysis could not demonstrate any statistically significant association between knowledge with age, gender or educational status.

Different to our expectation, there was no significant correlation of knowledge with the duration of dialysis.

Lack of reiteration of important information related to AVF self-care from health care providers could be a contributing factor for this. Thus, we recommend that patients should be educated about AVF care verbally and by leaflets during every visit. Furthermore, health care provider should be encouraged to inquire whether patient has been following the instructions given to improve compliance of patients towards AVF self-care at home.

In our extended review we could not find any similar research done at other settings in Sri Lanka. Hence, we encourage research in other parallel settings in Sri Lanka to identify the different factors which can be addressed to improve the outcome. It will be beneficial to establish national guidelines to educate the population with ESRD regarding AVF self care.

Conclusion

The study demonstrates overall good knowledge, positive attitudes leading to adequate practices towards AVF self-care at the access site. No statistically significant correlation was observed between the understanding of the patients and age, gender, level of education, duration of dialysis.

Training programmes targeting the health care providers are recommended which will ultimately transfer the knowledge of the importance of AVF self care to the patients. In addition, continuous program of health education should be encouraged with use of written material which allow later reference to solve doubts that may appear. Periodic evaluation of the patient's knowledge, attitudes and practices will aid in developing future educational strategies towards achievement of necessary care.

Limitations

This study was conducted at a non-tertiary care hospital only but the level of patient knowledge, attitudes and practices in different types of settings could have given more understanding into different aspects of factors linked to patients' KAP.

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