ORIGINAL ARTICLE

Unavailability of Av Fistulas at the Initiation of Haemodialysis in Pakistan- Limitations and Implications

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ABSTRACT

Aim: To evaluate the possible factors behind unavailability of AV fistulas when there is a need of haemodialysis in chronic kidney disease patients in Pakistan.

Methods: One hundred consecutive CKD patients presenting for haemodialysis through outpatients and emergency departments during a period of three months (March 2011 to May 2011) were included in this study. Patients were interviewed according to a standardised questionnaire.

Results: The Demographic characteristics revealed there were 52(52%) male patients and 48(48%) female patients (with mean age of 34.2 years). 34% patients were diabetics and 46% patients had chronic hypertension. None of the patients had AVF at the time of initiation of haemodialysis. Thirty six (36%) patients were advised to get the AVF but they refused the surgery even having prior knowledge of CKD. Thirty one (31%) patients were not aware of their pre-existing progressive renal disease. Although ten (10%) patients had prior knowledge of their kidney disease but they were not referred to a nephrologist or vascular surgeon for AVF. Eight (8%) patients did not have availability of surgeon trained in vascular access creation. Seven (7%) patients mentioned poverty of resources. Six (6%) patients had unsuccessful AVF surgery. Only two (2%) patients presented with presumed ARF. They received dialysis through temporary catheter and did not get AVF for 3 months in hope of recovery.

Conclusion: In this study the two most frequent reasons for unavailability of AV fistulas were refusal on the part of patient to permanent vascular access despite progressive CKD and the presence of advanced CKD (stage 5) without having a prior knowledge of their kidney disease. Both issues highlight the lack of public awareness and health education and also underscore the importance of robust efforts on the part of medical community and health authorities to educate the masses about kidney disease. In this context, both are modifiable risk factors that would help maximise AVFs and minimise access associated morbidity.

Keywords: AV fistula, haemodialysis, chronic kidney disease

INTRODUCTION

Patients with Chronic kidney disease (CKD) are progressively increasing all over the world and especially in developing countries like Pakistan. It is almost equally prevalent among men and women in Pakistan. CKD occurs when nephrons are damaged enough that only a few nephrons are left to clear the waste in blood. Patients with hypertension and diabetes are at greater risk to develop end stages of renal diseases. Worsening CKD mandates the need for renal replacement therapy (RRT). Various modes of RRT include haemodialysis (HD), peritoneal dialysis (PD) and renal transplantation. Most commonly used method of RRT in Pakistan is HD.

Haemodialysis is the standard proposed treatment for patients with end stage renal disease (ESRD). For this purpose long term and reliable dialysis access is required on the body of patient. Arteriovenous fistula (AVF) is the most reliable and preferred vascular access. AV fistulas are communications between artery and adjacent vein created surgically in an extremity. Most commonly used vascular access modalities are of following three types

Native AVF: AVF is created by establishing a connection between artery and vein by a minor surgical procedure (Figure 1.1). Mostly non-dominant arm is chosen for this purpose. In a right handed person the preferred site for AVF will be on left arm. With time, this connection becomes even stronger than the normal artery and vein by passage of high pressure blood. It usually requires 6 weeks to mature before it could be used for haemodialysis.

AV Graft: Arteriovenous Grafts are created by prosthetic implantations (figure 1.2). Implants used for this purpose are

- Plastic tubes
- Bovine vessels
- Saphenousveins
- Polytetrafluoroethylene (PTFE)

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AV grafts are available to be used for dialysis by 2-3 weeks[1,2,3].

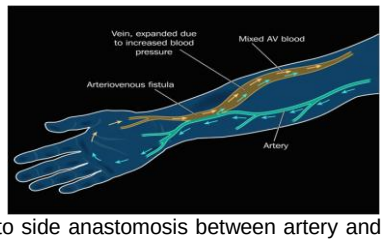

Fig. 1: Side to side anastomosis between artery and vein for AVF formation.

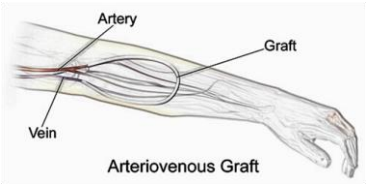

Fig. 2: AV Graft

Central venous catheter: These are large bore catheters and are used for immediate vascular access in patients with acute renal failure or in patients with progressive CKD who do not have permanent vascular access. Catheter is removed when a reliable fistula or graft has been created to endure the chronic haemodialysis.

The National Kidney Foundation Kidney Disease Outcomes Quality Initiative (KDOQI) standards recommend the use of Native AVF access once developed fully over AV Grafts because of its more durability, patency and lesser spectrum of complications[4]. Patients getting dialysis via AV fistula are on more safe side, hospital stay is shorter and chances of survival increase for them. But on the other hand those who dialyze with Central Venous Catheter (CVC) or AV grafts face more dreadful risks and complications. CVC can be a direct source of infection resulting in sepsis and highermorbidity[5,6,7].

Distal fistulas of upper limb are more convenient to be used as compared to proximal fistulas because proximal fistulas have greater diameter and chances of complications are more[8,9].

Patients for whom renal transplant is not recommended or who cannot find a suitable donor are opted for AVFs as haemodialysis access site and are used as long lasting sites for this purpose. A great concern is focused on patency and proper functioning of these fistulas. Presence of localised or generalised infection is a contraindication to percutaneous AVF surgical procedures.

In Pakistan for the past many years various studies have reported the significance of haemodialysis via arteriovenous fistula but still there is a huge population undergoing HD via temporary Dialysis catheters. On this background, we conducted this study to evaluate the reasons for unavailability of AVFs at the time of initiation of haemodialysis in patients with progressive CKD in Pakistan.

PATIENTS & METHODS

This study was conducted by department of Nephrology at Jinnah hospital Lahore. Informed consent to participate in this study was obtained from all the patients included in this study. One hundred consecutive patients of CKD presenting for haemodialysis through outpatients and emergency departments during the three months of duration from March 2011 to May 2011 were followed. Data about their age, sex, any pre-existing renal disease and previous tunnelled CVC use was collected. They were interviewed according to a standardised questionnaire about the reasons for unavailability of AV fistulas at the time of initiation of haemodialysis. The result based on their answers was computed. They were also advised and counselled to get AV fistula surgery done for their long term benefits.

RESULT

Out of One hundred patients 52 (52%) were male patients and 48 (48%) were female patients. None of them had AVF at the time of initiation of haemodialysis. The Demographic data of those patients is shown in table-1.

Table-1: Baseline Demographic Data of the patients

Age (in years)	34.2 (16-88)
Male gender	52 (52%)
Female gender	48 (48%)
Diabetes mellitus	34 (34%)
Hypertension	46 (46%)
Number of AVFs present at the initiation of haemodialysis	0 (0%)

Out of 100 patients 52 (52%) were male patients and 48 (48%) were female patients, both with mean age of 34.2 years. Thirty four patients (34%) had diabetes mellitus. Forty six patients (46%) had chronic hypertension at the time of this study. None of them had AVF at the time of initiation of haemodialysis. Out of the total, Thirty six patients (36%) were advised previously to get AVF formed but they were not willing and refused the surgery on their own. Thirty one patients (31%) were those who were not even aware of their pre-existing progressive renal disease. Although ten (10%) patients had prior knowledge of their kidney disease but they were not referred to nephrologist or vascular surgeon for AVF Surgery. Eight patients (8%) had knowledge about their disease and were referred to consult vascular surgeon but they did not have availability of surgeon well trained in vascular access creation surgery. Seven (7%) patients mentioned poverty of resources

and non-affordability of expenses. Six patients (6%) had unsuccessful AVF surgery. Only two patients (2%) presented with presumed ARF. They received dialysis through temporary catheter and did not get AVF formed for 3 months in a hope of recovery. More than one factor was positive in some patients but the result is compiled according to single best positive answer by them. The result concluded is shown by the following pie chart

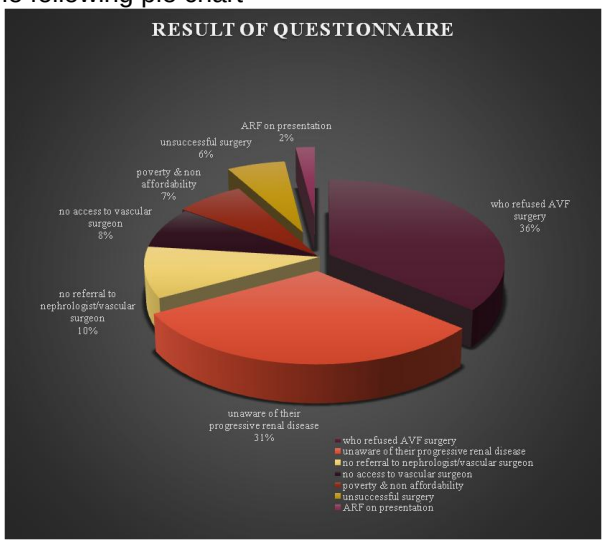

Fig. 1: Result of the study.

DISCUSSION

In Pakistan prevalence of chronic kidney disease is increasing due to lack of primary and secondary health care facilities, inadequate funding on the part of Government and increasing risk factors for CKD such as Hypertension and Diabetes. A study by Lopez-Vergas PA narrates the facts about psychological perspective of patients regarding AVF surgery stating that AVF is no doubt a minor surgical procedure but it is difficult for patients to accept it because of fears associated with complications[10]. Non-cooperation and anxiety on the part of patient result in delay of their treatment and contribute to many health related adverse outcomes[11].

In this study one hundred patients were evaluated and the most frequent reason for not having AVF at the time of initiation of haemodialysis in Pakistan was found to be the refusal to AVF surgery because of someself-presumed false beliefs and certain misconceptions. Another large portion of this whole group did not have AVF because they were unaware of their pre-existing renal disease. They visited the Nephrologist only when CKD had progressed to stage 5. The other reason concluded out is lack of experienced vascular surgeon. These people came from far flung areas of Pakistan where people are not well aware of their health issues and moreover the lack of availability of skilled surgeon aggravates the situation. Some patients encountered unsuccessful surgery. This failure of AVF surgery can be due to inexperienced hands or ischemic injuries in patients with Hypertension and Diabetes.Fassiadis N describes in his study that surgeon`s skills are the main factors contributing to the success and patency of fistulae[12]. Failure in fistula functioning may also result from thrombosis at the site of this connection or in later stages due to stenosis of vessels. Before going for AVF surgery in patients with progressive CKD, a proper work up of relevant base line investigations is mandatory to avoid any per-operative or post-operative emergencies[13,14]. In earlier studies it was considered that failure rate of fistula is higher in women because of small diameter of vessels in them but now this concept is negated by recent researches stating that success or failure of AV fistula does not depend upon gender but it depends upon other factors like co-existing hypertension, atherosclerosis, diabetes mellitus and old age[15,16].

KDOQI recommends that vascular access should be created when serum creatinine levels rise to more than 4mg/dl or when creatinine clearance drops to less than 25ml/min[17]. A study by Pisoni shows that even in developed countries a vast majority of patients who are in need to start chronic haemodialysis and require pre-dialysis care regarding AVF, get late referrals to nephrologist. Meanwhile they rely on temporary tunnelled catheters as initial resort[18]. It also points out that a huge gap exists between the recommended guidelines and the methods that are practised in our country as well as on international level.

Temporary catheters are in practice on large scale in our set up. The reason behind this practice is lack of awareness about permanent vascular access and no proper follow up with nephrologist. Ultimately patients choose more life threatening resorts like central venous catheters. Medkuori G carried out a study to analyse vascular access and related complications and retrospectively followed 190 patients who had been on HD for a period of 12 to 240 months. He found that in 164 (86.3%) patients, haemodialysis was initiated through temporary catheters inserted in internal jugular vein[19]. It is concluded from different studies that the use of CVC is highly associated with life risking complications like haemorrhages, central venous stenosis[20,21] and sepsis[22]. All these complications can be avoided by timely consultation for AV fistulas by an experienced vascular surgeon.

In our study early referral to Nephrologist was very low as compared to other countries where 60%-70% patients consult nephrologist >4 months before

starting the dialysis and 69%-88% patients consult nephrologist >1 month before starting dialysis[23].

One issue pointed out is non-affordability of expenses of surgery.These issues can be sorted out by better health policies and easy availability of Nephrologist, Vascular surgeon and Radiologist to the poor patients as well[24]. There is a dire need for mass education by mutual coordination of medical community and health authoritieson kidney diseases, proper investigations and proposed treatments. Though facilities of dialysis are present in Pakistan for many years but they need to be organised with a cost effective Dialysis Programme including AVF surgeries and timely availability of haemodialysis to facilitatepatients[25].

CONCLUSION

Creation and maintenance of AVF has been a challenge in our set up for a long time. AVF is the preferred vascular access in CKD stage 5 for initiating haemodialysis and it proves as a lifeline in patients with CKD. A great number of patients fail to get this surgery due to lack of education about their health, diseases, associated complications and unavailability of resources. The information gathered by this study can help improve the outcome in such patients by arranging seminars, road walks, campaigns and improving the health policies to facilitate the easy access to nephrologist and vascular surgeon to get timely creation of permanent vascular access. AVF should be created 6 weeks before starting haemodialysis whenever required. These measures will surely decrease the rate of morbidity and mortality in progressive CKD patients of Pakistan.

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