

Effect Of Av Shunt On Cardiac Function in Patient with Fair Systolic Function

A.M.Mohamed, S.M.Ammar, M.M.Ali and W.M.Tawfik

Cardiology Dept, Faculty of Medicine, Benha Univ, Benha, Egypt

E-Mail: Dr.hamouda50@gmail.com

Abstract

Cardiovascular disease is the leading cause of the death in patients receiving chronic renal replacement therapy, Arteriovenous fistulas [AVFs] have superior longevity, lower infection and mortality rates and are associated with lower cost, and hence have become the vascular access of choice for patients needing dialysis. The aim of this study is to assess the effect of AVF on cardiac function in patients with fair systolic function in patients with ESRD. This is a prospective, non-controlled, observational study that will include 20 patients who will be admitted to Heliopolis Hospital with ESRD and treated with hemodialysis and cardiac function will be assessed by echocardiography preoperative of AVF creation and 3 months postoperative. There was statistically significant difference in diastolic dysfunction grades between before and after AVF. There is an effect of AVF on cardiac function in patients with fair systolic function in patients with ESRD as there was statistically significant difference in diastolic dysfunction grades between before and after AVF.

Keywords: AVF, Cardiovascular disease, ESRD.

1. Introduction

Hemodialysis [HDx] stays those foundation about renal substitution cost treatment for end-stage renal disappointment [ESRD] patients overall. Then again its formation need An number from claiming unfriendly hemodynamic results. Instantly taking after creation, arteriovenous fistula [AVF] will be connected with an expand to heart yield [CO], attained predominantly through a decrease On systemic vascular resistance, expanded myocardial contractility, What's more a expansion to stroke volume [SV] What's more heart rate [1,2]. These alterations need aid connected with early increments clinched alongside left ventricular [LV] filling weight with those possibility for resultant sway for atrial and ventricular chamber measurements Also capacity.

To uphold addition systemic perfusion, co must increment proportionately, bringing about longer-term suggestions to cardiovascular Furthermore vascular structure Also work [2,3]. Historically, AVF-creation need been connected with intensifying from claiming lv hypertrophy Furthermore resultant diastolic brokenness Furthermore exited atrial dilatation [4]. In a few patients, a monster AVF might prompt progressive high-output cardiovascular failure, notwithstanding safeguarded lv systolic capacity [5,6]. To date, large portions of the investigations assessing the cardiovascular [CV] impacts for AVF have utilized an echocardiographic procedure.

Cardiovascular malady will be the heading reason for those death in patients getting constant renal substitution cost therapy [1,2] arteriovenous fistulas [AVFs] have predominant longevity, lower infection and mortal sin rates What's more need aid connected with lower cost, and hence forth have turn into the vascular get from claiming decision for patients expecting dialysis. Notwithstanding their cooperation with An lower mortality, AVFs have critical impacts for cardiovascular functions predominantly identified with the build for preload Also cardiac output [CO].

Congestive heart disappointment [CHF] may be Exceedingly pervasive among patients with ESRD. Give or take 35–40% of patients with ESRD have a made CHF finding In start of hemodialysis. [7,8 and 9] Patients for

ESRD Furthermore CHF bring a far worse prognosis over the individuals without CHF [10]. Since hemodynamic streamlining is those corner stone about Dealing with patients with ESRD and in addition the individuals with CHF, concentrating on the hemodynamic effects from claiming AVFs over patients for ESRD for and without CHF is An sensible errand.

Those sway from claiming these physiological impacts of AVF on the cardiac function will be dubious. Same time a significant number investigations suggested that those diminished vascular safety and the expanded CO are predisposing variables for those advancement alternately the worsening of heart failure, [7] others suggester that those decline On peripheral resistance Furthermore pulse for a parallel expand in ejection portion Might make possibly valuable [11]. Despite A percentage creators postulate that cardiovascular decompensation in ESRD patients for AVFs happens main Previously, people with previously built constant heart disease, there is evidence that AVF formation may be An major hazard figure to Creating An new onset CHF [4,12, 13 and 14], in the HEMO study, indications of CHF developed de novo Throughout dialysis treatment Previously, 17% of the patients. Albeit this Might be purely because of the helter skelter predominance about risk factors to Creating CHF in the ESRD population, a independent effect from claiming AVFs need been proposed.

2. Subjects and methods

2.1 Study design

This is a prospective, non-controlled, observational study that will include 20 patients who will be admitted to Heliopolis Hospital with ESRD and treated with hemodialysis and cardiac function will be assessed by echocardiography preoperative of AVF creation and 3 months postoperative.

2.2 Ethical Considerations

Approval was taken from the Ethics Committee of Heliopolis Hospital, aim of the study explained to the patients also the privacy of data secured.

2.3 Inclusion criteria

Patients with ESRD candidate for AVF creation. - Fair systolic function [EF \approx 40-50%].

2.4 Exclusion criteria

Impaired systolic function [$<$ 40%]. - Ischemic heart disease. - Significant valvular heart disease. - Patients with previous AVF

All the patients will be subjected to:

- Full history taking: - Age - sex - risk factors
- examination : - Blood pressure - Pulse - Cardiac examination - Chest examination
- Echocardiographic data: full echocardiographic parameters including: - Dimesions - Valves - Ejection Fraction using [M-Mode & Simpson method]

Images from standard views , including the parasternal long axis , short axis at the papillary muscle level , and apical 4 chamber and 2 chamber views were recorded , then left ventricular ejection fraction was estimated by two Dimensional echocardiography and M-Mode and Modified simpson method as well as left ventricular diastolic function parameters such deceleration time [DT] [ms] , peak transmitral early diastolic flow velocity [E wave] , peak transmitral late diastolic flow velocity [A wave] , mitral E/A ratio .

2.5 Study end point

- 1ry end point : Change in ejection fraction after the shunt
- 2ry end point : Change in the clinical symptoms of the patients includes :

Heart failure: inability of the heart to keep up with the demands on it and failure of the heart to pump blood with normal efficiency and the heart is unable to provide adequate blood flow to the organs

Arrhythmia : any type of arrhythmia either tachyarrhthmia or bradyarrhythmia .

2.6 Statistical analysis

All data were collected, tabulated and statistically analyzed using SPSS version 19. Continuous Quantitative variables were expressed as the mean \pm SD and categorical qualitative variables were expressed as absolute frequencies [number]& relative frequencies [percentage]. Continuous data were checked for normality by using Shapiro Walk test. Paired t-test was used to compare two related groups of normally distributed data.

Paired categorical data were compared using sign test. All tests were two sided. p-value $<$ 0.05 was considered statistically significant [S], p-value $<$ 0.001 was considered highly statistically significant [HS], and p-value \geq 0.05 was considered statistically insignificant [NS].

3. Results

Table (1) Age of the studied participants ranged between 25 and 67 years with mean of 49 years. Near three fourth of them were males [70%], more than half of them had diabetes mellitus and hypertension [60% and 70% respectively]. Only 10% of them had RWMA. Table (2) HS: highly significant difference [$<$ 0.001]. NS: non-significant difference [p $>$ 0.05]. Table (3) highly statistically significant differences in both LA, LVEDd and LVEDs parameters between before and after AVF which were found to be significantly higher in after doing AVF when compared to before it [4.92, 5.65 and 4.42 versus 4.73, 5.47 and 4.28 respectively]. Table (4) statistically significant difference in ejection fraction between before and after AVF which was found to be significantly higher in after doing AVF when compared to before it [45.8 versus 44.3 respectively] Table (5) non-statistically significant difference in chest findings between before and after AVF. It was noticed that all cases return to clear chest findings after doing AVF. Table (6) non-statistically significant difference in cardiac findings between before and after AVF Table (7) non-statistically significant difference in valves conditions between before and after AVF. Table (8) was statistically significant difference in diastolic dysfunction grades between before and after AVF.

Table (1) Baseline characteristics of the studied group

Variable	Studied group [n=20]	
Age		
Mean \pm SD	49.2 \pm 11.4	
Range	25 – 67	
	No	%
Sex		
Female	6	30
Male	14	70
DM		
Yes	12	60
No	8	40
Hypertension		
Yes	14	70
No	6	30

Table (1) Continue

Ischemic heart disease		
No	18	90
RWMA	2	10

Table (2) Relation between before and after intervention as regarding blood pressure and pulse among the studied group.

Variable	N.	Mean	p-value
Systolic B.P			
Before	20	153.7	<0.001
After	20	141.7	[HS]
Diastolic B.P			
Before	20	91.2	<0.001
After	20	84.5	[HS]
Pulse			
Before	20	75.3	0.360
After	20	77.2	[NS]

Table (3) Relation between before and after intervention as regarding ECHO parameters among the studied group

Variable	N.	Mean	p-value
LA			
Before	20	4.73	<0.001
After	20	4.92	(HS)
IVSD			
Before	20	0.99	1.00
After	20	0.99	(NS)
PWDD			
Before	20	0.99	0.330
After	20	1.00	(NS)
LVEDD			
Before	20	5.47	<0.001
After	20	5.65	(HS)
LVEDS			
Before	20	4.28	0.001
After	20	4.42	(S)

Table (4) Relation between before and after intervention as regarding EF among the studied group

Variable	N.	Mean	p-value
EF			
Before	20	44.3	0.009
After	20	45.8	(S)

Table (5) Chest examination before and after intervention among the studied group

Variable	Chest exam before (n=20)		Chest exam after (n=20)		P
	No	%	No	%	
Chest findings					
Basal crepitations	5	25	0	0	0.527 (NS)
Clear	13	65	20	100	
Wheezes	1	5	0	0	
Coarse crepitation	1	5	0	0	

Table (6) Cardiac examination before and after intervention among the studied group

Variable	Cardiac exam before (n=20)		Cardiac exam after (n=20)		P
	No	%	No	%	
Cardiac findings					
S1-S2					
S1-S2-S3	11	55	11	55	0.655
S1-S2 systolic murmur on apex	3	15	2	10	(NS)
	6	30	7	35	

Table (7) Valves examination before and after intervention among the studied group

Variable	Cardiac exam before (n=20)		Cardiac exam after (n=20)		P
	No	%	No	%	
Valves					
Mild MR	8	40	9	45	
Mild AR	1	5	1	5	
Moderate MR	6	30	5	25	
Moderate MR, mild AR	1	5	0	0	0.750
Trivial MR					(NS)
Moderate MR, Moderate AR	4	20	2	10	
	0	0	1	5	
Moderate to severe MR					
Severe MR	0	0	1	5	
	0	0	1	5	

Table (8) Diastolic dysfunction before and after intervention among the studied group

Variable	Dysfunction before (n=20)		Dysfunction after (n=20)		P
	No	%	No	%	
Dysfunction					
Grade I	13	65	5	25	
Grade II	6	30	12	60	0.002
Grade III	1	5	3	15	[S]

4. Discussion

Those study included 20 patients evaluated Eventually Tom's perusing echocardiography preoperative for AVF What's more 3 months after AVF production.

The sum subjects were assessed Toward history taking[period , sex , danger figures] , clinical examination including [pulse , heart rate , midsection examination , cardiovascular examination]. Our examine indicated that there were Exceedingly statistically huge contrasts clinched alongside both systolic Also diastolic pulse between previously, then then afterward AVF which were discovered will make altogether more level over then afterward completing AVF when contrasted with When it [141. 7, 84. 5 versus 153. 7 What's more 91. 2 respectively]. However, those Contrast the middle of previously, then then afterward mediation might have been non-significant Similarly as in regards pulse.

Same time On [15] contemplate also demonstrated that diastolic What's more systolic pulse diminished altogether times 7 and 14 following av fitula formation.

In Yogesh n. V. Reddy, et al. 2017 consider described chronic, longitudinal progressions On cardiovascular structure Also capacity to patients for ESRD following those surgical creation of a AVF/AVG for haemodialysis get. Accompanying AVF, there were huge diminishments On blood vessel blood weight.

In our investigation those Contrast between previously, then then afterward mediation might have been non-significant as in regards pulse.

Same time On investigation indicated that heart rate expanded by a normal for 5 bpm [P = 0. 003]. In our ponder indicates that there were Exceedingly statistically noteworthy contrasts in both LA, LVEDd and LVEDs parameters between previously, then then afterward AVF which were discovered to make altogether higher clinched alongside following completing AVF The point when contrasted with in the recent past it [4. 92, 5. 65 and 4. 42 versus 4. 73, 5. 47 Furthermore 4. 28 respectively]. However, those distinction between previously, then then afterward intercession might have

been non-significant Concerning illustration in regards both IVSD Also PWDD.

Done indicated that ,AVF/AVG formation might have been connected with huge dilatation in the left chamber Furthermore ,changes that were connected with the advancement from claiming episode hezekiah What's more expanded danger for passing.

Previously, [15] consider demonstrated that chap expanded significantly times 7 Furthermore 14 then afterward AVF formation. A significant increment in LVEDd might have been watched days 3 on 14 after those operation, yet all the LVEDs might have been not modified.

Over comparative ponder indicated that echocardiographic parameters for both consider aggregations the HFA gathering exhibited An critical build Previously, lv measurements , volumes , la volume list , lv impostor list.

On our examine reveals to that there might have been statistically huge distinction in launch portion the middle of previously, then after AVF which might have been found with a chance to be fundamentally higher Previously, after completing AVF At contrasted with When it [45. 8 versus 44. 3 respectively].

What's more clinched alongside [15] study demonstrated that formation of the av fistula generated all the a significant expand to FS and co then afterward 3 on 14 days. Maximal expands On these parameters concerning lv systolic work were acquired day 7 [FS, 8%; CO, 15%].

Same time done consider indicated that there might have been An slight diminishment On lv systolic capacity , prove by abatements for lv EF.

On comparable study demonstrated that, huge diminishing over launch portion LVEF , and the HFA one assembly needed fundamentally expand On lv fillingpressure , HFA bunch for patients exhibited An significantly bring down launch portion for An mean quality about 57. 32% Likewise contrasted with 62. 90% to the non—HFA one assembly.

Done vicinity for HF,the choice for a intercession to decrease the AVF Qa if be underpinned via beneficial control about other possibility danger figures referred to on precipitate the infection For example, anemia, hypertension, overabundance inter—dialyticweight addition including a fluid volume over-burden.

Lf clinical indications about hezekiah [e. G. Anxiety prompted or resting dysnea, orthopnea, asthenia,andoedma] persist, then a mediation methodology with right anAVF for persistently helter skelter Qa [22000] ought make embraced.

Clinched alongside our contemplate indicated diastolic brokenness previously, then following intercession "around those concentrated on gathering reveals to that there might have been statistically huge distinction done diastolic brokenness evaluations the middle of previously, then then afterward AVF.

What's more in comparable ponder indicated the HFA one assembly needed fundamentally progress Previously, E/A proportion [denoting higher lv filling weight].

And clinched alongside [15] contemplate indicated that lv diastolic capacity with lv inflow profiles , those crest speed from claiming e wave expanded days 3 with 14 then afterward making of the AV fistula, and that of the a wave expanded significantly best day 7. An time-related increment Previously, E-A proportion might have been watched 18% day 14.

Same time for investigation indicated that there might have been no change for lv diastolic capacity.

What's more for consider indicated that diastolic filling parameters [E should An ratio] were also impaired, characteristic from claiming intensifying diastolic works.

In our examine demonstrated that there might have been statistically critical distinction done pulmonary hypertension between previously, then after AVF.

Also Previously, examine indicated that the HFA assembly needed fundamentally increment SPAP as compared with non-HFA aggregation.

Same time over reveals to build over systolic pulmonary conduit weight over patients accepting hemodialysis with spiral What's more brachial AVFs.

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