

## Effect of Aspirin on Maturation of Arteriovenous Fistula Created for Hemodialysis in End Stage Renal Disease Patients

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### Abstract

**Background:** With the increasing prevalence of End stage renal disease (ESRD) there is a growing need for Hemodialysis (HD). Safe, durable and reliable vascular access is essential for successful HD but failure of maturation continue to present significant barriers to successful fistula use. The study was conducted on 50 patients to assess the effect of aspirin on maturation of radio-cephalic arteriovenous fistula (RC-AVF).

**Aim of Study:** To assess the effect of Aspirin on the maturation of RC-AVF versus non treatment group.

**Patients and Methods:** This study was conducted on fifty ESRD patients who had a RC-AVF in either Ain Shams University Hospitals or El Sahel Teaching Hospital from September 2019 to March 2020. We have included all patients who had an RC-AVF under local anesthesia and the fistula was clinically functioning immediately post operatively. The study is a prospective randomized controlled trial (RCT) comparing Aspirin intake versus no treatment in patients who had a functioning RC-AVF after finishing creation of the fistula. The patients in the first group was given aspirin (ASA) 75mg tablet once daily after AVF creation for six weeks postoperatively, while the patients in the second group did not receive any medication.

**Results:** After Six weeks of follow-up of all patients, maturation occurred in 94 % of patients. The maturation rate in Aspirin group was 96%, while it was 92% in control group with a *p*-value of 0.5743. Access thrombosis has occurred in one patient in the aspirin group and two patients in the control group with a *p*-value of 0.327.

The mean flow volume was 780ml/min  $\pm$  127.2 in the aspirin group and 754.4ml/min  $\pm$  128.9 in the control group with a *p*-value = 0.484. The mean vein diameter in aspirin group was 5.86 mm  $\pm$  0.342 and that of the control group was 5.992 mm  $\pm$  0.287 with a *p*-value=0.284.

**Conclusion:** Aspirin use was not beneficial for AVF maturation among ESRD patients who undergo a new RC-AVF. That's why practice patterns in this area needs to be improved to limit unbeneficial aspirin use.

**Key Words:** Radio-cephalic arteriovenous fistula – Aspirin – Maturation – End-stage renal disease.

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### Introduction

**WITH** the increasing prevalence of End stage renal disease (ESRD) there is a growing need for Hemodialysis (HD) [1]. Safe, durable and reliable vascular access is essential for successful HD but failure of maturation continue to present significant barriers to successful fistula use [2]. Long term patency rates of native arteriovenous fistula (AVF) has the best outcome compared to other methods e.g. synthetic grafts and double lumen catheters [3]. Autogenous AVF also has the lowest cost and the lowest infection rate. Radio cephalic autogenously arteriovenous fistula (RC-AVF) is the first choice for vascular dialysis. This is a logical choice, as further fistulae can be created proximally if needed (i.e. brachio-cephalic/basilic fistula) and the risk of steal syndrome is reduced [4].

Several researches tried to improve the patency and maturation of arterio-venous access (AVA) by administering different drugs. Their studies have discussed the effect of drugs like (aspirin, ticlopidine, dipyridamole, dipyridamole plus aspirin, warfarin, fish oil, clopidogrel, and sulfinpyrazone) on patency and maturation of AVA. Aspirin is the most commonly used antiplatelet agent [5]. It depends on the irreversible inhibition of arachidonate cyclo-oxygenase activity in platelets, thereby reducing the extent of thromboxane A<sub>2</sub> (TXA<sub>2</sub>) formation and consequently the aggregability of platelets [6]. Aspirin is suggested as medical therapy, which potentially inhibits neointimal hyperplasia and improves vascular access patency [7]. However, the effect of aspirin has not been adequately evaluated with respect to vascular access maturation.

**Aim of the work:**

The aim of this study is to assess the effect of Aspirin on the maturation of a functioning RC-AVF versus non-treatment group.

### Patients and Methods

The study is a prospective randomized controlled trial (RCT) comparing Aspirin intake versus no treatment in End stage renal disease (ESRD) patients who had a functioning RC-AVF after creation of the fistula. The study was conducted on patients who had their RC-AVF surgery in either Ain Shams University Hospitals or El Sahel Teaching Hospital - from September 2019 to March 2020.

We have included 50 patients who had a RC-AVF, which was functioning clinically just after the fistula creation. The fistula was described to be functioning by the presence of palpable thrill and audible bruit over it. Patients were divided into two groups:

The 1<sup>st</sup> group (treatment group)-included 25 patients-received Aspirin, acetylsalicylic acid (ASA) 75mg tablet once daily from day one after AVF creation for 6 weeks, while the 2<sup>nd</sup> group (control group)-included 25 patients-did not receive any medication. After two and six weeks the two groups were examined clinically and radiologically for fistula maturation & presence of complications.

#### Inclusion criteria:

All adult mentally competent patients with ESRD who had a functioning radio-cephalic AVF (RC-AVF) done under local anaesthesia for haemodialysis were included in the study if they agree to participate & signed the detailed consent form.

#### Exclusion criteria:

- Patients who refused to be enrolled or randomised in the study.
- Age below 18 years.
- Patients with a known bleeding disorder.
- Pregnant & lactating female patients.
- Active peptic ulcer disease.
- Severe hepatic insufficiency.
- Patients who are on antiplatelet or anticoagulation.
- Patients who already have a known allergy to aspirin.
- Patients who are not suitable for RC- AVF due to technical issues such as: Small-cephalic vein diameter <2.5mm-or thrombosed cephalic vein bilaterally, weak radial pulse or positive Allen test or radial artery diameter <2mm and
- Patients who are not candidate for AVF due to their general condition such as: Unwell on the

day of the surgery, can't lie on operating table during the surgery and patients with heart failure.

- Patients with known central venous stenosis or occlusion on the side of the intended AVF creation.

#### Methods:

##### Patient evaluation:

Full history taking, clinical examination, radiological assessment of cephalic vein and radial artery and laboratory tests were done to all patients.

Full history taking included age, gender, history of hypertension (HTN), smoking, diabetes mellitus (DM), congestive heart failure (CHF), hepatic insufficiency, allergy to aspirin and administration of antiplatelet or anticoagulation. Clinical examination included examination of arterial pulses, measuring brachial systolic pressure bilaterally, examination of upper limb superficial veins, assessment of their course & straightness, identification of the presence of venous collaterals over shoulder or anterior chest wall or upper arm and assessment of motor power and sensory examination. Laboratory investigation required for the procedure-complete blood count, random blood sugar, INR, liver enzymes, electrolytes and arterial blood gases-were done.

Preoperative duplex ultrasound vascular mapping was done to identify the best suitable vein for the autogenous RC-AVF.

All patients who were included signed an informed consent and agreed to attend the follow-up visits after the procedure. The consent included an explanation of the nature of the intended procedure and Aspirin administration, benefits and all the possible complications.

The fifty RC-AVF were created by vascular surgeons. The selected vein was marked on the skin. The surgical technique was standardized as follows:

- The Local anesthesia (lidocaine 2%) was infiltrated with a dose of 4.5-5mg/kg not exceeding 300mg and then a 3-5cm.
- A longitudinal skin incision in the distal forearm between the radial artery and the cephalic vein closer to the artery as it is deeper & more difficult to mobilize was done.
- Cephalic vein was dissected (5cm segment), divided, the distal end and tributaries of the vein were ligated using 2-0 silk and the vein was gently distended with heparinized saline.

- The radial artery was dissected until a segment of the artery was isolated for proximal and distal control (3cm segment).
- A 10-12mm longitudinal anterior arteriotomy was done by using a scalpel size 11 and Potts scissors.
- Both vessels were prepared for the anastomosis. Vein to artery anastomosis: Posterior venotomy was performed then cephalic vein was moved medially over the artery and the fistula was created between the posterior aspect of the vein (underside of the vein) and the anterior (upper) aspect of the artery with a 6.0 polypropylene.
- The skin closure was done using 3.0 polypropylene sutures.
- The fistula was then examined for presence of palpable thrill and audible bruit.

All patients were instructed to do exercise by using rubber ball three times daily-each time ten minutes- for six weeks and to avoid using the upper limb of the AVF for blood pressure measurement, blood sampling or IV line insertion/injections. All functioning AVFs were examined clinically intra-operative, two and six weeks post-operatively for the presence of palpable thrill and audible bruit. Duplex follow-up for diameter of the vein, depth from skin and flow volume was done two and six weeks post-operatively. The first cannulation of the RC-AVF was performed once the vein had matured adequately (usually six to twelve weeks after surgery). Primary outcome was the RC-AVF maturation. Maturation was determined clinically by the presence of palpable thrill and audible bruit over the AVF after at least 6 weeks of creation and radiologically by duplex US. Radiological criteria of maturation was defined as cephalic diameter at the anastomosis  $\geq 6\text{mm}$  and flow of the blood across the anastomosis  $\geq 500\text{ml/minute}$ . Secondary endpoints were presence of complications: Such as: Bleeding, infection, stenosis, thrombosis, distal limb ischemia and Mortality.

Patients were randomized using closed envelopes method. Every patient has chosen a closed envelope to indicate the group he will be allocated to (either the first group or the second group).

*Statistical analysis:*

Recorded data were analyzed using the statistical package for social sciences, version 20.0 (SPSS Inc., Chicago, Illinois, USA). Quantitative data were expressed as mean  $\pm$  standard deviation (SD). Qualitative data were expressed as frequency and percentage. Probability (*p*-value): \**p*-value  $\leq 0.05$  was considered significant, \*\**p*-value  $\leq 0.001$  was considered as highly significant, *p*-value  $> 0.05$  was considered insignificant.

**Results**

The study included 50 ESRD patients who came to the Vascular Surgery Department at Ain Shams University Hospitals and El Sahel Teaching Hospital for AVF creation under the supervision of thesis supervisors from September 2019 to March 2020. We have included all patients who had an RC-AVF under local anesthesia and the fistula was clinically functioning immediately post operatively. Patients were divided into two groups: The 1<sup>st</sup> group (treatment group)-included 25 patients-received Aspirin, acetylsalicylic acid (ASA) 75mg tablet once daily after AVF creation for 6 weeks, while the 2<sup>nd</sup> group (control group)-included 25 patients- did not receive any medication. After two and six weeks the two groups were examined clinically and radiologically for fistula maturation.

The mean age of patients in the aspirin group was  $56.08 \pm 11.7$  years and that of the control group was  $54.56 \pm 13.9$  years with a *p*-value of 0.759. Among the patients included in the study, four of them were found to be current smokers. As regard diabetes, 28% were diabetic. Hypertensive patients represented 86% of the patients. The number of patients who were referred before the start of dialysis was six patients. The demographic characteristics and risk factor distribution are shown in (Table 1) and there was no statistically significant difference between both groups among demographics.

Table (1): Comparison between groups according to demographic data.

Demographic data	On Aspirin	Not on Aspirin	<i>p</i> -value
<i>Age:</i>			
Mean $\pm$ (SD)	56.08 $\pm$ (11.7)	54.56 $\pm$ (13.9)	0.759
Range	30-80	25-88	
<i>Gender:</i>			
Male	9 (36%)	12 (48%)	0.417
Female	16 (64%)	13 (52%)	
Current smokers	1 (4%)	3 (12%)	0.177
Hypertensive	21 (84%)	22 (88%)	0.327
Diabetics	8 (32%)	6 (24%)	0.161

RC-AVF was done in the non-dominant hand of 28 patients. The mean preoperative cephalic vein (CV) diameter was 2.828 with SD  $\pm 0.25$  in the aspirin group and 2.776 with SD  $\pm 0.27$  in the control group with a *p*-value of 0.626. The Mean preoperative radial artery (RA) diameter was 2.18 mm with SD  $\pm (0.19)$  in the aspirin group and 2.26 mm with SD  $\pm (0.17)$  in the control group with a *p*-value 0.218 (Table 2).

Table (2): Comparison between groups according to preoperative CV and RA diameter.

Variables	Preoperative CV diameter, mm		Preoperative RA diameter, mm	
	Mean ± (SD)	P-value	Mean ± (SD)	P-value
Not on Aspirin	2.776±(0.27)	0.626	2.26±(0.17)	0.218
On Aspirin	2.828±(0.25)		2.18±(0.19)	

Maturation of arteriovenous fistula was assessed by duplex u/s with measurement of vein diameter, flow volume, and depth of the vein from the skin. Measurement was taken two weeks and six weeks post-operatively.

The two weeks post-operatively mean vein diameter of aspirin group was 3.876mm ± 0.456 and that of the control group was 4.036mm ± 0.573 and a p-value=0.284. The six weeks post-operatively mean vein diameter of aspirin group was 5.86mm ± 0.342 and that of the control group was 5.992mm ± 0.287 and a p-value=0.284 (Table 3, Fig. 1).

Table (3): Comparison between groups according to postoperative vein diameter.

Variables	Vein diameter 2 weeks postoperative, mm		Vein diameter 6 weeks postoperative, mm	
	Mean ± (SD)	P-value	Mean ± (SD)	P-value
Not on Aspirin	4.036±(0.573)	0.284	5.992±(0.287)	0.097
On Aspirin	3.876±(0.456)		5.86±(0.342)	

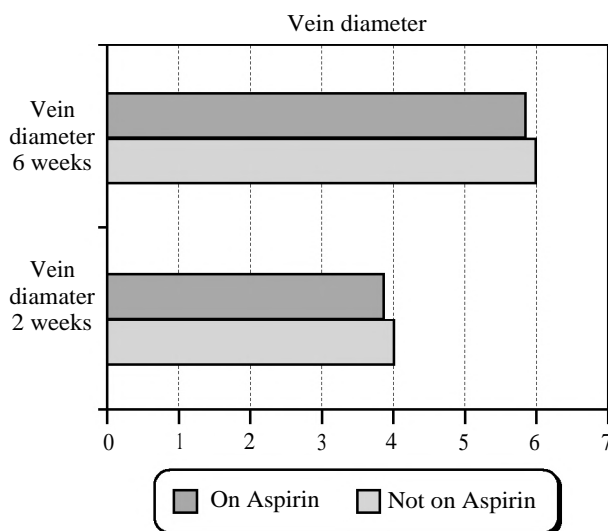


Fig. (1): Comparison between the two groups according to post-operative vein diameter.

According to postoperative depth from the skin, the two weeks post-operatively mean depth from skin of aspirin group was 2.01mm ± 0.57 and that of the control group was 2.14mm ± 0.57 and a p-value=0.419. The six weeks post-operatively mean depth from the skin of aspirin group was 1.51mm ± 0.42 and that of the control group was 1.49mm ± 0.35 and p-value=0.869 (Table 4, Fig. 2).

Table (4): Comparison between groups according to postoperative depth of the vein from skin.

Variables	Depth 2 weeks postoperative, mm		Depth 6 weeks postoperative, mm	
	Mean ± (SD)	P-value	Mean ± (SD)	P-value
Not on Aspirin	2.14±(0.57)	0.419	1.49±(0.35)	0.869
On Aspirin	2.01±(0.59)		1.51±(0.42)	

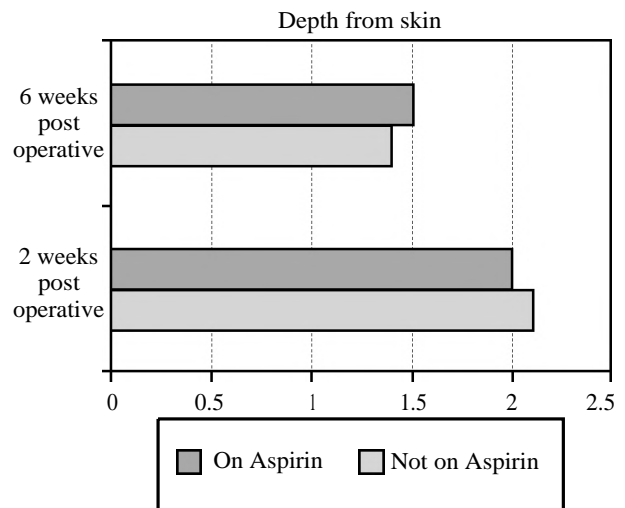


Fig. (2): Comparison between the two groups according to post-operative depth from skin.

The mean flow volume two weeks post-operatively was 634.4ml/min ± 78.2 in the aspirin group and 656ml/min ± 79.8 in the control group with a p-value=0.303. After following-up patients six weeks post-operatively, it has been found that the mean flow volume increased and became 780 ml/min ± 127.2 in the aspirin group and 754.4 ml/min ± 128.9 in the control group with a p-value =0.484 (Table 5, Fig. 3).

Table (5): Comparison between groups according to postoperative Flow volume.

Variables	Flow volume 2 weeks postoperative, ml/min		Flow volume 6 week postoperative, ml/min	
	Mean ± (SD)	P-value	Mean ± (SD)	P-value
Not on Aspirin	656±(79.8)	0.303	754.4±(128.9)	0.484
On Aspirin	634.4±(78.2)		780±(127.2)	

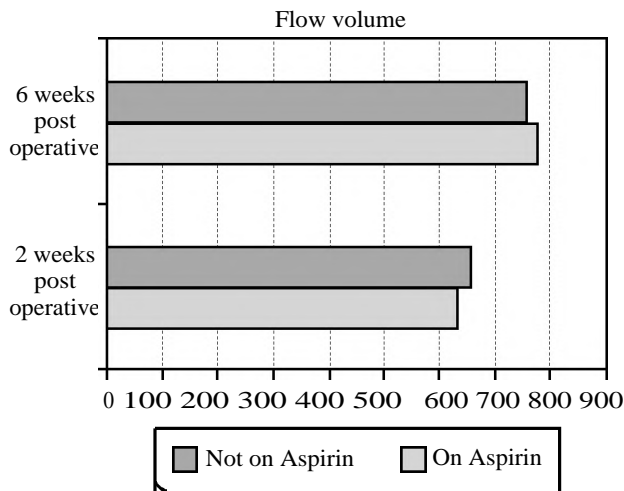


Fig. (3): Comparison between the two groups according to post-operative flow volume.

According to our selected definition of maturation, 96% of patients developed RC-AVF maturation in Aspirin group in comparison to 92% in the control group ( $p$ -value=0.5743).

As regarding post-operative bleeding, three patients (12%) in the aspirin group had postoperative bleeding that resolved without treatment, no post-operative bleeding was detected in the control group with a  $p$ -value=0.083. One patient (4%) from each group had a mild infection that resolved with antibiotic treatment with a  $p$ -value of >0.99. Access thrombosis has occurred in one patient in the aspirin group and two patients in the control group during the first two weeks due to hypotension on dialysis with a  $p$ -value of 0.161 (Table 7, Fig. 4).

Table (6): Comparison between groups according to Maturation.

	On aspirin	Not on aspirin	$p$ -value
Maturation	96% (24/25)	92%(23/25)	0.5743

Table (7): Comparison between both groups according to postoperative complications.

	On aspirin	Not on aspirin	$p$ -value
Bleeding	3 (12%)	0 (0%)	0.083
Infection	1 (4%)	1 (4%)	>0.99
Noninfectious fluid collections	2 (8%)	3 (12%)	0.675
Anastomotic complications	0 (0%)	0 (0%)	>0.99
Mid-AV access/runoff vein complications	0 (0%)	0 (0%)	>0.99
Access thrombosis	1 (4%)	2 (8%)	0.327
Steal syndrome	0 (0%)	1 (4%)	0.327
Venous hypertension	2 (8%)	1 (4%)	0.327
Neuropathy	2 (8%)	0 (0%)	0.161

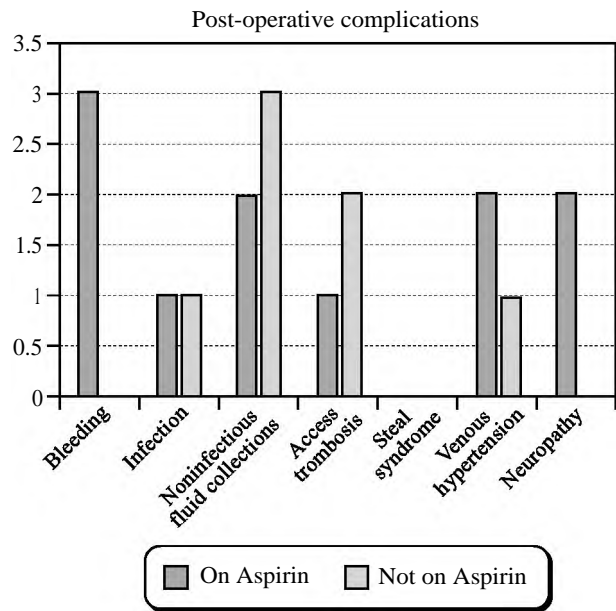


Fig. (4): Comparison between the two groups according to post-operative complications.

### Discussion

This study is a prospective RCT comparing Aspirin intake versus no treatment in patients who had a functioning RC-AVF after finishing creation of the fistula. Patients were divided into 2 groups, the 1st group (aspirin group)-included 25 patients-received Aspirin 75mg tablet once daily after AVF creation for 6 weeks, while the 2nd group (control group) did not receive any medication. The two groups were examined clinically and radiologically for fistula maturation after two and six weeks, respectively.

Other studies in the literature that compared aspirin intake versus no treatment or aspirin to other medications or different medications are enlisted in (Table 8).

In the current study, the demographic data findings for each group are summarized in (Table 1). The age of the patients ranges from 25 to 88 years with mean age of  $55.32 \pm 12.9$  years. This correlates to the study done by Ghorbani A et al., [8] it was undertaken to determine the effects of clopidogrel on the incidence of primary AVF failure among newly created AVFs, however our study was undertaken to determine the effect of aspirin not clopidogrel. The mean age of the patients in the clopidogrel group was  $44.23 \pm 3.36$  years and that of the placebo group was  $45.8 \pm 2.84$  years with a  $p$ -value of 0.47. It correlates also to Rouzrokh M et al., [9] who found in their study that among 390 patients (179 males, 211 females), 22 patients were aged less than 25 years old, and 74 cases

were above 66 years of age and the rest were aged between these ages. It should be highlighted that Rouzrokh M et al., [9] were talking about the effect

of antiplatelet (aspirin and dipyridamole) on patency rate of AVF while we were analyzing the effect of aspirin on the maturation of AVF.

Table (8)

Study title	Author name	Year	Groups	Study design
- The Effect of Antiplatelet Drugs on the Patency Rate of Arterio-venous Fistulae in Hemodialysis Patients	- Rouzrokh M et al.	- From Sep 2003 to Aug 2007	- The first group was treated with a daily 100 mg of Aspirin. The second group was treated with a daily 75 mg of dipyridamol. The third group was treated with placebo. Each group consisted of 130 patients.	- A Randomized control Trial. Surgery was done in Taleghani Hospital, Kerman-shah, Iran
- Effect of Fish Oil Supplementation and Aspirin Use on Arteriovenous Fistula Failure in Patients Requiring Hemodialysis	- Irish AB et al.	- From 2008 to 2014	- There were 567 participants randomized to fish oil (n=284) or placebo (n=283). There were 406 participants randomized to aspirin (n=203) or placebo (n=203).	- A Randomized Clinical Trial. The study was done at 35 dialysis centers in Australia, Malaysia, New Zealand, and the United Kingdom.
- Consistent aspirin use associated with improved arteriovenous fistula survival among incident hemodialysis patients in the dialysis outcomes and practice patterns study	- Hasegawa T et al.	- From 1996 to 2004	- Patients using aspirin at baseline and one year later were considered consistent aspirin users.	- An international prospective observational cohort study of maintenance HD patients being carried out in four regions (Europe, Australia and New Zealand, Japan, and North America).
- Randomized controlled trial of clopidogrel to prevent primary arteriovenous fistula failure in hemodialysis patients	- Ghorbani A et al.	- From December 2006 to March 2008	- Clopidogrel (75mg/daily) Vs placebo group	- Randomized, double-blind trial
- Effect of Clopidogrel on Early Failure of Arteriovenous Fistulas for Hemodialysis	- Dember LM	- From 2003 to 2007	- Participants (n= 877) were randomly assigned to receive clopidogrel (300-mg loading dose followed by daily dose of 75 mg; n=441) or placebo (n=436) for 6 weeks	- Randomized, double-blind, placebo controlled trial conducted at 9 US centers

In the present study there is no gender difference between the two groups and it has been shown that there was no noticeable effect of aspirin on AVF maturation. In accordance with Rouzrokh M et al., [9] there was no statistically significant difference between (aspirin, dipyridamole and placebo group) on the patency of AVFs among different genders with a *p*-value of 0.2028 between aspirin and placebo group and a *p*-value of 0.2671 between dipyridamole and placebo group.

In the current study, most of the patients were not diabetic in the two groups. Seventeen patients (68%) of the aspirin group and nineteen patients

(76%) of the control group were not diabetics with a *p*-value = 0.161. This correlates to the study done by Ghorbani A et al., [8] only 15.1 % of the patients in the clopidogrel group and 11.8% of the patients in placebo group were diabetics. In contrary, Rouzrokh M et al., 81 70% of the patients in aspirin group, 80% of the patients in dipyridamole group and 70.7% of the patients in the control group were diabetics. According to Dember LM et al., [5] 49.2% of patients in the clopidogrel group and 47% of patients in the placebo group were diabetics. It should be pointed that Dember LM et al., was undertaken to determine the effect of clopidogrel on early failure of arteriovenous fistula (AVF).

Viecelli AK et al., [10] in their FAVOURED trial, they investigated whether three months of omega-3 polyunsaturated fatty acids, either alone or in combination with aspirin, would effectively reduce primary access failure of de novo arteriovenous fistulae. This trial is an international double-blinded RCT conducted in 34 hemodialysis centers in Australia, New Zealand, the United Kingdom and Malaysia. Diabetes mellitus was significantly more prevalent in the Malaysian cohort than (Australia, New Zealand and the United Kingdom) group (65% vs 43%,  $p < 0.001$ ). The prevalence of diabetes mellitus was highest in participants underwent AVG surgery (53%) compared to participants who underwent an AVF (46%) but there was no clearly obvious difference between both groups regarding diabetes.

In the present study, the fistula was created in the non-dominant hand of 15 patients (60%) in the aspirin group and 12 patients (48%) in the control group. According to Rouzrokh M et al., [9] the fistula was created in the non-dominant hand of 60 patients (68.1 %) in the aspirin group and 63 patients (76.6%) in the dipyridamol group.

In the current study, the mean preoperative vein diameter in both groups was ( $2.828 \pm 0.25$  in aspirin group and  $2.776 \pm 0.27$  in the control group) and this was associated with functional maturation in both groups. This is because of the restrictive selection of the patients and the good preoperative mapping. In this regard, Siddiqui M et al., [11] they also found that the preoperative vein diameter greater than 2.5mm resulted in a fivefold increase in fistula maturation as compared to vein diameter less than 2.5mm. According to Mendes et al., [12] they reported that when the diameter of the cephalic veins exceeded 2mm, there was a 76% success rate of functional dialysis access, whereas, if the diameter was less than 2mm, there was only a 16% success rate. Khavanin M et al., [13] also mentioned that the maturation of the fistula showed significant correlation with the preoperative mean diameter of vein which was  $2.40\text{mm} \pm 0.79$ .

No previous studies have discussed the effect of drugs like (aspirin, ticlopidine, dipyridamole, dipyridamole plus aspirin, warfarin, fish oil, clopidogrel, and sulfinpyrazone) on post-operative flow volume, depth from the skin and vein diameter and their association with functional maturation.

In this study, the two weeks post-operatively mean flow volume was  $634.4\text{ml}/\text{min} \pm 78.2$  in the aspirin group and  $656\text{ml}/\text{min} \pm 79.8$  in the control group. After following-up patients six weeks post-

operatively it has been found that the mean flow volume increased and became  $780\text{ml}/\text{min} \pm 127.2$  in the aspirin group and  $754.4\text{ml}/\text{min} \pm 128.9$  in the control group. According to Robbin ML et al., [14] fistula adequacy for dialysis had been doubled if the minimum venous diameter was 0.4cm or greater and this was found in 24 patients out of 27 representing 89% of the patients included in their study. They have also emphasized that fistula adequacy for dialysis had been doubled if flow volume was  $500\text{mL}/\text{min}$  or greater and this was found in 26 patients out of 31 representing 84% of the patients included in their study. According to Ives CL et al., [15] access blood flow volume of  $500\text{ml}/\text{min}$  and AVF diameter of 4mm eight weeks post-operative are needed to support dialysis. Abd-Elmageed MK et al., [16] followed-up 100 patients for six months, they encountered 18 failed cases while there were 82 mature fistula. The blood flow was considerably lower in the failed fistulas than that in the mature fistulas at early postoperative period ( $p\text{-value}=0.001$ ). The cutoff value was  $200.5\text{ml}/\text{min}$ . This matches to results of the study done by Ladenheim ED et al., [17] who concluded that blood flow  $< 200\text{mL}/\text{min}$  at the 1-week post-operative was associated with failed maturation of the fistula.

The overall incidence of bleeding events was 12% in this study, three patients in the aspirin group had postoperative bleeding that resolved without treatment. According to Dember LM et al., [5] the frequency and the severity of bleeding events were not greater among participants treated with clopidogrel than among those who received placebo with ( $p > 0.99\%$ ). According to Viecelli AK et al., [10] in order to minimize the risk of bleeding, a lower dose of aspirin (100mg) was used in the FAVOURED trial. Low dose aspirin, while not associated with increased bleeding, did not reduce the frequency of access thrombosis during the first 12 months of AVF creation.

Regarding infection only one patient (4%) from each group had infection that resolved with antibiotic treatment. According to Padberg et al., [18] the reported incidence of infections affecting the AV access site ranges from 0.56% to 5% per year for autogenous AV access. Infection may respond to antibiotics. If associated with bleeding, then ligation proximal to the anastomosis may be required. In this study, there is no statistically significant difference between the two groups regarding maturation. There was one case of access thrombosis in the aspirin group and two cases the control group ( $p=0.327$ ).

In the current study, after Six weeks of follow-up of all patients, maturation occurred in 94 % of patients. The maturation rate in Aspirin group was 96%, while it was 92% in control group with a *p*-value of 0.5743. This correlates to the study done by Irish AB, [19] he found that the risk of fistula failure was similar between the aspirin and placebo arms (87 of 194 [45%] vs 83 of 194 [43%]; *p*=.68). On the contrary, according to Hasegawa T et al., [20] consistent aspirin use was significantly related to a lower risk of final AVF failure (*p*-value=0.07).

#### Limitation of the study:

The sample size was relatively small. Because we chose the patients according to specific criteria that exclude most of the available cases.

The second limitation was the relative short duration of follow-up. The study focused on the immediate outcome of maturation and not on long-term survival, as we followed-up the patients at two and six weeks post-operatively.

#### Conclusion:

Aspirin use is not beneficial for AVF maturation among ESRD patients who undergo a new AVF. That's why practice patterns in this area needs to be improved to limit unbeneficial aspirin use. Good preoperative mapping of AVF results in better AVF patency and maturation. Cephalic vein diameter of more than 2.5mm and radial artery diameter more than 2mm will be recommended for better maturation of AVF.

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Nil.

#### Conflict of interest:

There are no conflicts of interest.

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## دراسة تأثير عقار الأسبرين على نضج الوصلة الشريانية الوريدية المستخدمة في الغسيل الكلوي

مع زيادة أعداد مرضى الفشل الكلوي المزمن تزداد حاجتهم إلى الغسيل الكلوي عن طريق مدخل وعائى آمن قادر على تحمل الغسيل الكلوي الدموي المتكرر الذى يوفر الدم بالمعدل المطلوب لجهاز الغسيل الكلوي الدموي. تعد الوصلة الشريانية الوريدية من أفضل جراحات الغسيل الكلوي الدموي. وتعتبر هذه العملية من أسهل العمليات تقنياً وأقلهم من حيث المضاعفات.

تعد الوصلة الشريانية الوريدية بين الشريان الكعبرى والوريد الرأسى الخيار الأول للغسيل الكلوي الدموي. ولأن الوصلة الشريانية هامة فى حياة مرضى الغسيل الكلوي الدموي فقد وجهت العديد من الأبحاث نحو تحسين نضج الوصلة الشريانية الوريدية.

الدراسة هى تجربة عشوائية محكمة تقارن بين أخذ عقار الأسبرين مع عدم أخذ أى عقار على نضج الوصلة الشريانية الوريدية المستخدمة فى الغسيل الكلوي الدموي فى المرضى الذين تم عمل وصلة شريانية وريدية عاملة بين الشريان الكعبرى والوريد الرأسى.

تم تقسيم المرضى إلى مجموعتين المجموعة الأولى هى مجموعة الأسبرين والتي تتضمن ٢٥ مريضاً يأخذ كل مريض قرص أسبرين ٧٥ مجم يومياً لمدة ستة أسابيع من عمل الوصلة الشريانية الوريدية، والمجموعة الثانية لم تتلقى أية أدوية.

يُقيم نضج الوصلة الشريانية الوريدية بعد أسبوعين وبعد ستة أسابيع من العملية، بالفحص السريرى عن طريق الإحساس بالهزير أو سماع صوت لغط شريانى بالوصلة الشريانية الوريدية، أو بالفحص باستخدام أشعة الموجات فوق الصوتية المزودة عن طريق قياس قطر الوريد وعمق الوريد من الجلد وحجم الدم المتدفق بالوريد.

لم يوجد فى دراستنا أى اختلاف إحصائى ملحوظ بين المجموعتين بخصوص تأثير عقار الأسبرين على نضج الوصلة الشريانية الوريدية المستخدمة فى الغسيل الكلوي الدموي.

وجدت بعض المضاعفات فى المجموعتين ومنها تجلط الوصلة الشريانية الوريدية فى مريض واحد فى المجموعة الأولى (مجموعة الأسبرين) ومريضين فى المجموعة الثانية خلال أول أسبوعين من عمل العملية. وحدث نزيف بسيط فى ثلاث حالات (١٢٪) فقط من مجموعة الأسبرين حيث توقف دون أى علاجات. وحدث عدوى بسيطة فى مريض واحد (٤٪) من كل مجموعة تم علاجها بالمضادات الحيوية.