

# Advancing Age and Vascular Access: A Large Dialysis Provider's Perspective

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## INTRODUCTION

Nearly half of ESRD patients are >60 yrs old, and approximately 45% are female. Although age and gender should not limit arteriovenous fistulas (AVF) use for dialysis access, Ethier *et al.* (2008) recently reported lower AVF utilization in patients who were female, older or diabetic. Despite older patients commonly having more co-morbidities and taking more medications than younger patients, Bazylewicz *et al.* (2009) found patients >75 years and ages 40-60 had similar AVF patency. These were all single center or small multicenter studies. We analyzed vascular access type by age, gender and co-morbidities in our large dialysis population.

## METHODOLOGY

- We conducted a retrospective study of 103,475 DaVita patients analyzing vascular access type by age, gender and co-morbidities in January 2009.
- A multiple regression analysis predicting fistula vs. other access, controlled for diabetes, Charlson index, Caucasian and vintage tested the predictor variables of age and sex.
- To ascertain some of the predictors of AVF utilization, a general linear model using stepwise selection was used to predict AVF access compared to central venous catheter (CVC) or arteriovenous graft (AVG) from these variables.
- Diabetic status was removed from the model.

## RESULTS

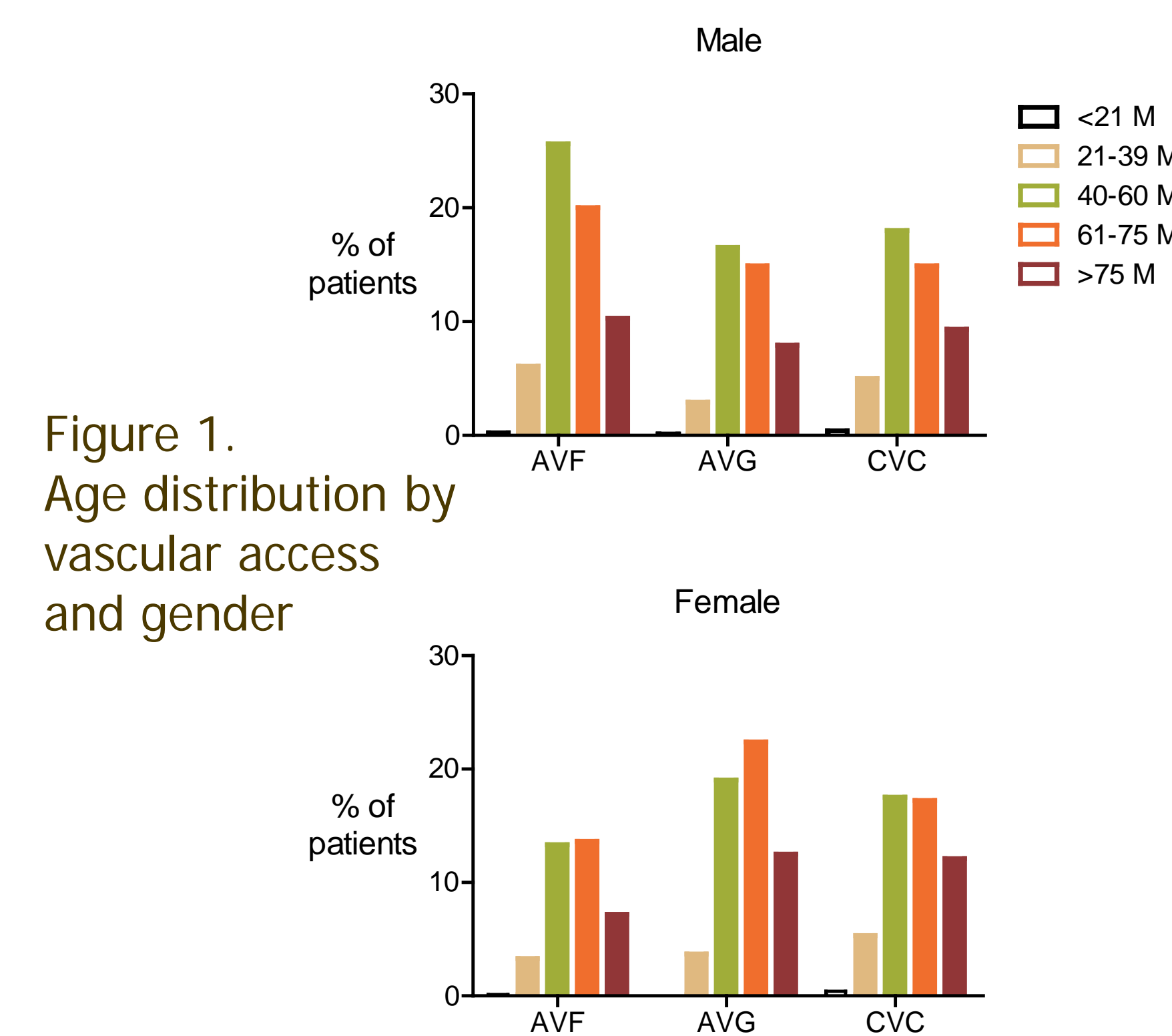


Figure 1. Age distribution by vascular access and gender

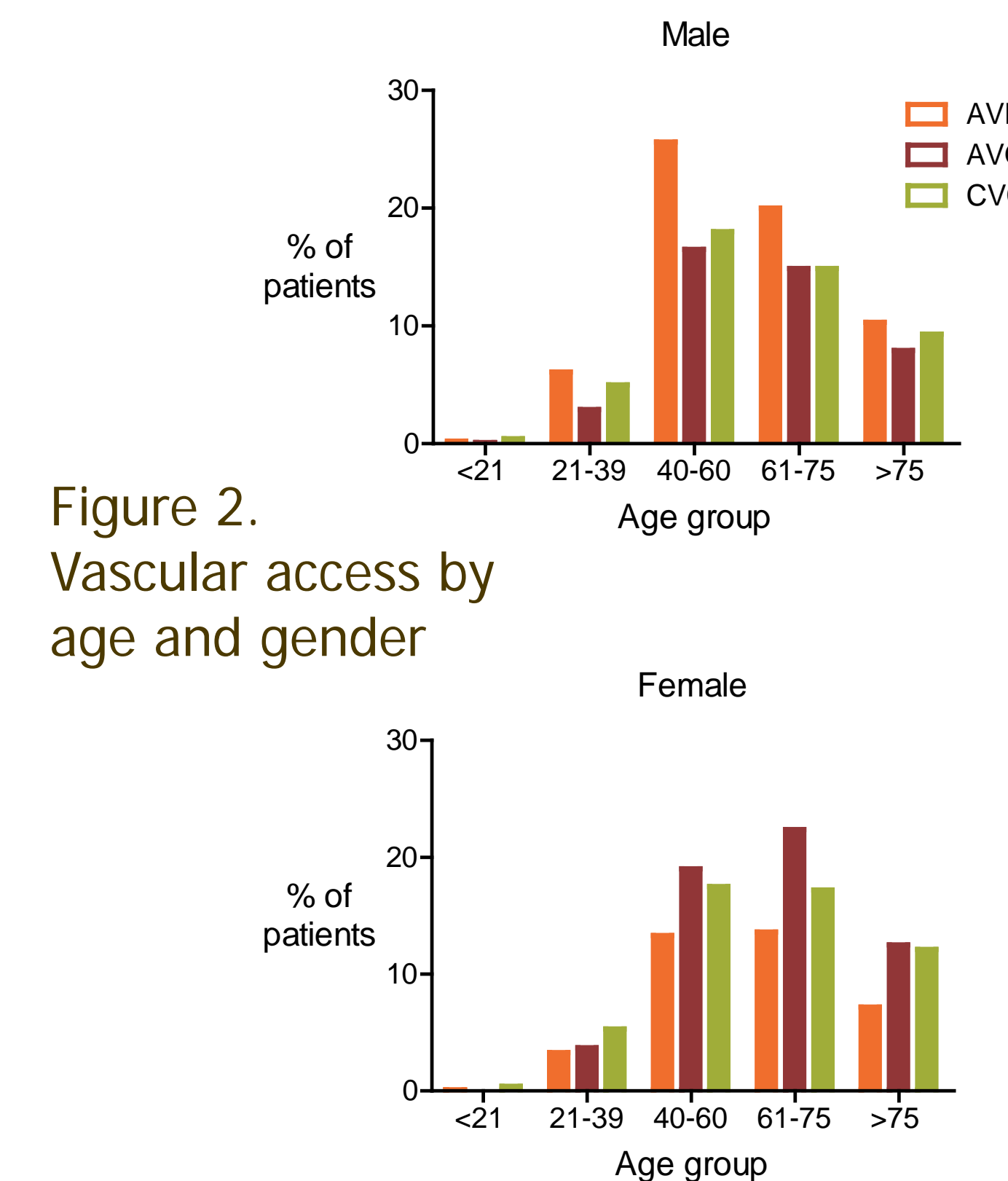


Figure 2. Vascular access by age and gender

Table 1. Predictor Variables

Age Group	Gender	% Caucasian	% Diabetic	Charlson Index	% AVF (in use or in place)	% AVG (in use or in place)	% CVC (in use or in place)
<21	F	.2	0	2.4±0.8	0.1	0.0	0.4
	M	.2	0	2.4±0.9	0.2	0.1	0.4
21-39	F	2.5	2.7	3.3±1.5	3.3	3.7	5.3
	M	3.5	3.3	3.1±1.5	6.1	2.9	5.0
40-60	F	12.0	15.7	4.5±1.7	13.3	19.0	17.5
	M	17.8	21.8	4.4±1.8	25.6	16.5	18.0
61-75	F	15.8	18.7	6.5±1.6	13.6	22.4	17.2
	M	20.6	20.2	6.4±1.6	20.0	14.9	14.9
>75	F	11.6	8.8	7.4±1.6	7.2	12.5	12.1
	M	15.8	8.7	7.4±1.6	10.3	7.9	9.3

## CONCLUSIONS

- Higher Charlson index, greater vintage, older age, and female gender were predictive of lower AVF placement; interestingly, diabetes, independent of Charlson index, was not retained as a predictor (Table 1).
- Likelihood of having an AVF decreased by 3% with each increasing age group, after controlling for vintage, Charlson index and race (Figure 1).
- Being female predicted a 15% reduced likelihood of having an AVF, after controlling for vintage, Charlson index and race.
- Caucasians had a 15% greater change of having an AVF, after controlling for age, sex, diabetes, Charlson index and vintage.

## KEY LEARNINGS

- ✓ AVF placement was substantially higher in the present sample than the previous DOPPS study reported for the US.
- ✓ Both advancing age and being female are associated with lower AVF use, as previously reported by the DOPPS study.
- ✓ The lower AVF rates in older females suggest future initiatives to reduce CVC use should focus on the root causes, including both patient reluctance and physician perception of poor blood vessels, in this vulnerable population.

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