
The Effect of Hemoglobin level on Arteriovenous Fistula survival in Hemodialysis patients in Tehran

Khavanin Zadeh M , Gholipour F, Hadipour R.



Iran University of Medical Sciences ,Tehran-Iran

Introduction

- # End Stage Renal Disease (ESRD) poses steadily growing challenges on the health care systems worldwide**
- # Renal replacement therapy with hemodialysis (HD) or kidney transplantation is the only possibility for ESRD patients to survive**
- # Permanent vascular access (VA) for hemodialysis treatment is needed**

Introduction

- # **A full correction of anemia in HD patients may lead to an increased risk of VA failure**
- # **maintaining the Hb of dialysis patients at nearly normal levels, great advantages in terms of quality of life, cardiac function , brain function , hospitalization and cost**
- # **decreased levels of Hb had adverse effects on cardiac and brain function**
- # **Thrombosis and infection of the vascular access site account to about 20 to 40 percent of all hospitalizations of patients undergoing hemodialysis**

Introduction

The goals of our study was :

Evaluate the impact of the Hb level on AVF survival

Methods and Subjects

- # 100 patients in one important tertiary HD center in Tehran
- # Prospective observational data were analyzed between April 2005 and December 2006

Methods and Subjects

- # The relative risk (RR) of access failure was evaluated in four different groups of patients divided according to their Hb levels:
 - <8 g/dl
 - 8 – 10 g/dl
 - 10 – 12 g/dl
 - >12 g/dl
- # Other factors possibly influencing VA survival were also considered: gender, age, smoking, diabetes, hypertension, parathyroid hormone & triglyceride levels, ACE inhibitor intake

Methods and Subjects

The analyses were performed using :

SPSS v.11.5

Kaplan Meier procedure

Cox regression

log rank test

Results

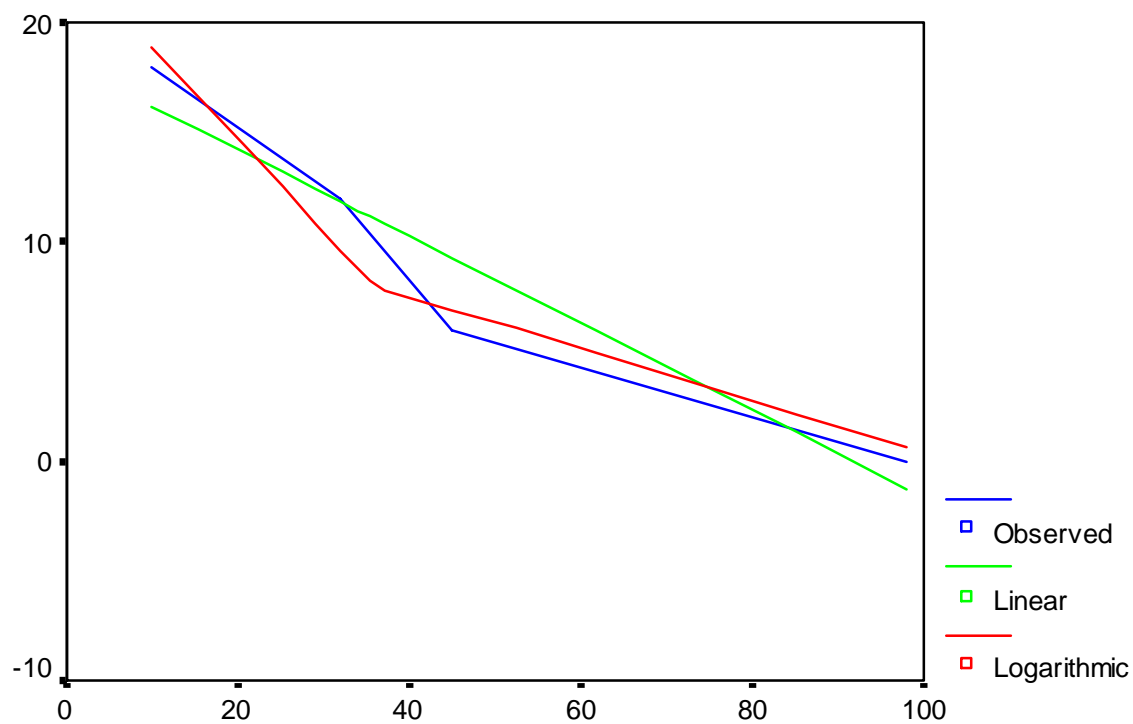
- # statistically significant higher risk of VA failure:
- # Hb <8 g/dl (RR=1.41; P=0.01)
- # Diabetes (RR=1.21; P=0.05)
- # age>60 years (RR=1.41; P=0.06)

<i>P-Value</i>	<i>Relative Risk (CI95%)</i>	<i>predictive factor (AV Fistula)</i>
0.06	1.41	>60 years
0.05	1.25	Diabetes
0.01	1.41	Hb <8g/dl

Results

Hb<8

Duration Fistula



Results

Divided Hb groups	Frequency	P-value	RR Of failure	Duration Fistula
Hb<8	26.8%	0.01	1.41	Less than 1M
8-10	31.2%	0.068	1.38	1-2
10-12	22%	0.249	1.32	2-3
Hb>12	20%	0.59	0.77	3-6

Results

- # No statistically significant difference :
- # Hb between 8 and 10 g/dl RR = 1.38 (P = 0.068)
- # Hb between 10 and 12 g/dl RR = 1.32 (P = 0.249)
- # Hb >12 g/dl RR= 0.77 g/dl (P = 0.59)

predictive factors for AV failure :

ACE inhibitor intake (RR=0.45; P=0.01)

Discussion

‡ large sample, randomized clinical trial discussed different aspect of normalization of Hb in HD patients in their 'Normal Hematocrit Cardiac Trial' recommended against the normalization of Hb levels in these patients. In this well-controlled clinical study, 1233 HD patients with clinically evident cardiac disease achieved a maintenance haematocrit of either 42 ± 3 or $30\pm 3\%$. Increased access thrombosis was found in the cohort of patients randomized to achieve the higher haematocrit of 42% (39 vs. 29%; $P = 0.001$) [Besarab et al. in 1998]

Discussion

416 Scandinavian patients with renal anemia were randomized to reach a normal Hb of 135-160 g/l . In this Swedish dialysis patients when Hb was normalized, the incidence of thrombovascular events and vascular access thrombosis in HD patients did not differ($P=0.37$) [Furuland et al]

Discussion

Jose M discussed aspect of normalization of Hb in HD patients in their study about the normalization of Hb levels in these patients.

In this clinical study, 1254 HD patients (1057 AVF) maintenance Hb <10 , 10-12 , 12-13 and >13g/dl.

Increased access thrombosis was found 1.8 times higher in AVFs with Hb <10 g/dl . [Jose M et al. in 2005]

Discussion

- # In the context of our study, we focused particularly on the possibility of an increased incidence of VA thrombosis. It is well known that complications of VA are the primary causes of morbidity (hospitalizations) in HD patients
- # we assume that normalization of Hb levels was not an RR factor for fistula survival in our population. Moreover, it was shown that the severely anemic patients (Hb <8g/dl) were the group with a statistically significant shorter fistula survival; therefore, anemia was a significant RR factor ($P = 0.01$) for fistula failure in our population

Discussion

Diabetes and the age over 60 years were associated with a higher risk of VA failure while treatment with an ACE inhibitor was associated with longer VA survival. The protective effect of ACE inhibitors has already been described in the literature [Saran et al]

ACE inhibitor may improve blood flow by increasing cardiac output associated with after load reduction. In addition to the classic atherogenic risk factors (diabetes and age), PTH has recently been suggested as a potential cause of vascular disease [Grandaliano *et al*].

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Iran, My country



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