



RISK FACTORS OF SHORT PERIPHERAL CATHETER INSERTION FAILURE: BUILDING A NEW DIVA SCORE. The **DIVAraba** Scale



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BACKGROUND & OBJECTIVES

Background

Literature on difficult intravenous access (**DIVA**) assessment is still scarce.

Objectives

To Identify the factors associated with short peripheral catheter insertion failure in adults and design a validated **DIVA assessment scale**.

METHODS

Study Design

Cross-sectional observational study at **Araba University Hospital**, Spain. All adults requiring short peripheral catheter insertion from October 22, 2021 to February 28, 2022, were included.

Variables

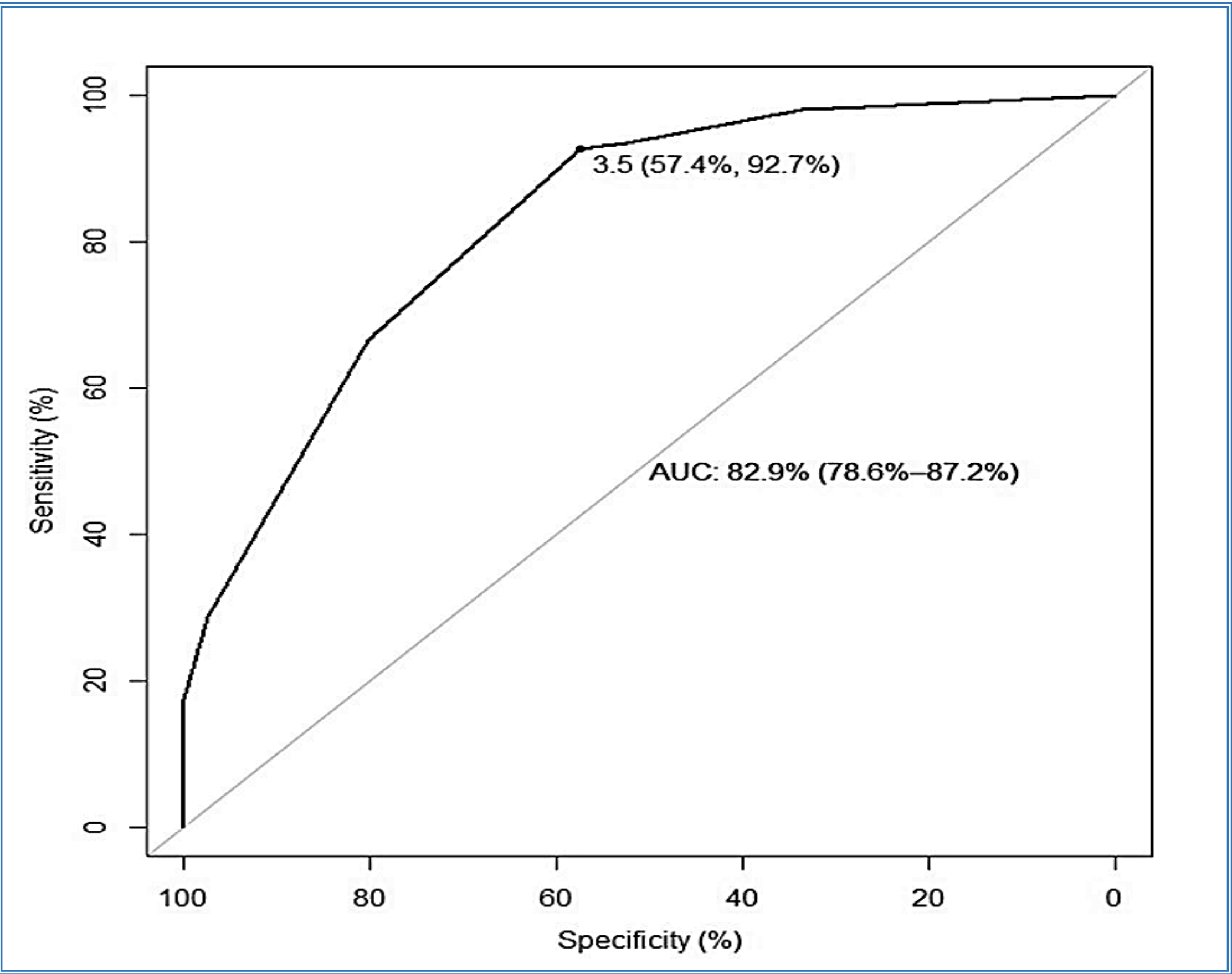
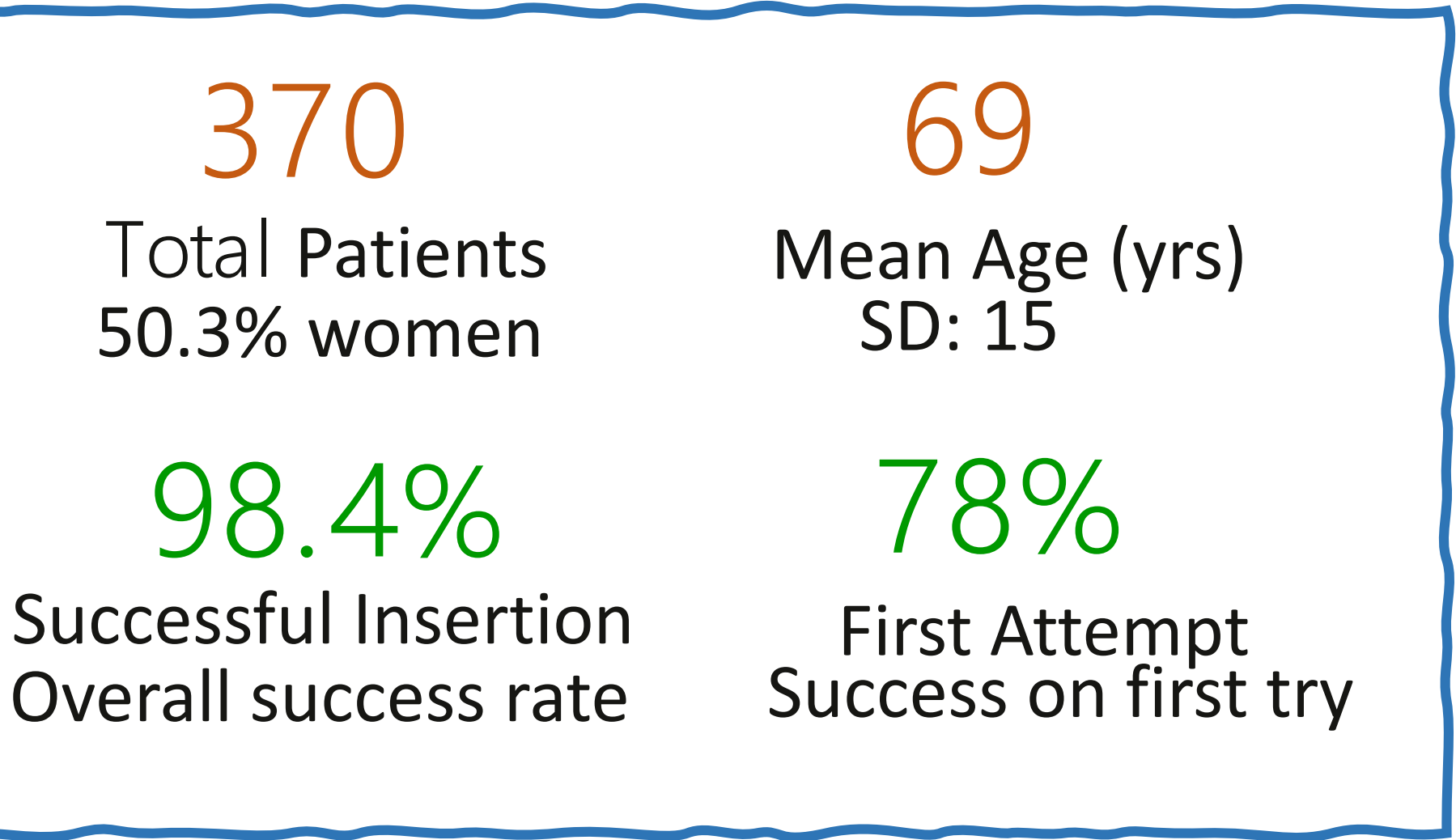
Primary: Successful insertion & number of attempts.
Secondary: Obesity, chronicity, anticoagulants, prior history of difficulty related to catheter insertion, visible/palpable veins, amongst others

Analysis

Univariate and multivariate logistic regression to identify the factors associated with catheter insertion failure. After both analysis, only the variables with $p < 0.05$ were considered. The SCORE '**DIVAraba**' was developed by assigning each scale item a weight to the multivariate betas. The cut-off point was established based on the ROC curve and the Youden index.

RESULTS

Study Sample



UNIVARIATE LOGISTIC REGRESSION ANALYSIS

Variables	N	OR (95% CI) ¹	p-value
Body mass index	362	1.06 (1.01- 1.10)	0.017
Obesity	362	1.94 (1.13- 3.45)	0.019
Anticoagulants/platelet antiaggregant	370	2.24 (1.44- 3.53)	<0.001
Tobacco use	363	0.55 (0.30- 1.02)	0.054
Chemotherapy	367	6.15 (1.19- 113)	0.082
Hematomas	370	2.52 (0.65- 16.6)	0.24
Leakage	370	2.25 (1.36 - 3.83)	0.002
Non-visible veins with tourniquet	370	3.75 (1.43 - 12.9)	0.015
Non palpable veins without tourniquet	370	3.64 (1.69- 9.08)	0.002
Non-visible veins with tourniquet	370	8,125,387 (0.00- NA)	0.98
Vein count <3		10.5 (3.74- 43.6)	<0.001
Non-palpable veins with tourniquet	370	2,878,906 (0.00- NA)	0.98
DIVA perception of the nurse in charge:	366		
Easy		—	
Moderate		2.54 (1.58 - 4.14)	<0.001
Difficult		6.56 (2.85 - 17.9)	<0.001
Visible or palpable veins in an unsuitable location	365	3.54 (2.08 - 6.31)	<0.001

¹OR = Odds Ratio, CI = Confidence Interval

The **DIVAraba** Score

Four variables retained after multivariate analysis ($p < 0.05$), weighted by regression betas:

DIVAaraba Score	
Variables	Points
Anticoagulant treatment prescribed	1
Chronic Conditions (Previous history of > 2 attempts for catheter insertion or blood analysis, or previous history of intravenous infused irritants drugs)	5
Obesity	3
Vein count <3	6
TOTAL	

CONCLUSIONS

Predictive Tool

The DIVAraba score helps nurses identify patients at **higher risk** of catheter insertion failure before the first attempt.

Ultrasound Guidance

The score indicates **when ultrasound support is needed**, enabling proactive clinical decision-making.

Clinical Impact

A validated, practical scale to improve patient safety and reduce failed insertion attempts in adult care settings.