

Evaluation of vascular access modality of hemodialysis patients: Analysis of real-world data in Italy

Geraldo Tadinho Monteverde Spencer¹, Melania Dovizio², Biagio Iacolare², Margherita Andretta³, Marcello Bacca⁴, Fausto Bartolini⁵, Antonietta Barbieri⁶, Andrea Ciaccia⁷, Alessandro Chinellato⁸, Alberto Costantini⁹, Francesco De Vita¹⁰, Simona Gentile¹¹, Daniela Mancini¹², Marzia Mensurati¹³, Rossella Moscogiuri¹⁴, Elena Mosele¹⁵, Romina Pagliaro¹⁶, Nicola Petragnani¹⁰, Davide Re¹⁷, Fiorenzo Santoleri⁹, Marzia Martoni¹, Francesca Di Stasi¹, Luca Degli Esposti²

¹W. L. Gore & Associates S.r.l., Verona, ²CliCon S.r.l. Società Benefit Health, Economics & Outcomes Research, Bologna, ³UOC Assistenza Farmaceutica Territoriale, Azienda ULSS 8 Berica, Vicenza, ⁴ASL Brindisi, Brindisi, ⁵Dipartimento Farmaceutico USL Umbria 2, Terni, ⁶SC Farmaceutica Territoriale, ASL VC, Vercelli, ⁷Servizio Farmaceutico Territoriale ASL Foggia, Foggia, ⁸Unità Operativa Farmacia Ospedaliera-ULSS 3 Serenissima, Mestre, ⁹UOC Farmacia Ospedaliera, ASL Pescara, Pescara, ¹⁰UOC Farmacia Ospedaliera, ASL Lanciano Vasto Chieti, Chieti, ¹¹Regione Molise Direzione Generale per la Salute, Campobasso, ¹²ASL Brindisi, Brindisi, ¹³UOC Farmaceutica Territoriale, ASL Roma 3, Roma, ¹⁴Dipartimento Farmaceutico ASL Taranto, Taranto, ¹⁵U.O.C. Assistenza Farmaceutica Territoriale, ULSS 7 Pedemontana, Bassano del Grappa (VI), ¹⁶U.O.C. Farmaceutica Territoriale, Azienda Sanitaria Locale Roma 5, Monterotondo, Roma, ¹⁷Dipartimento Assistenza Territoriale, ASL Teramo, Teramo

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BACKGROUND AND OBJECTIVES

The three major types of vascular access of hemodialysis, central venous catheter (CVC), arteriovenous fistula (AVF) and arteriovenous graft (AVG) are known to have implications on successful hemodialysis in patients with end-stage renal disease (ESRD).^{1,2}

AIMS

This real-world analysis investigated the vascular access of hemodialysis types: CVC, AVF and AVG in an Italian clinical practice setting.

METHODS

Data source

A retrospective analysis was conducted on administrative databases of a sample of Italian health care entities (geographically distributed across Italy), covering approximately 10% of the country population.

Population

From January 2009 to August 2022, all the patients with at least one record of hemodialysis (procedure code 39.95 and/or hospitalization code V56.0) were included.

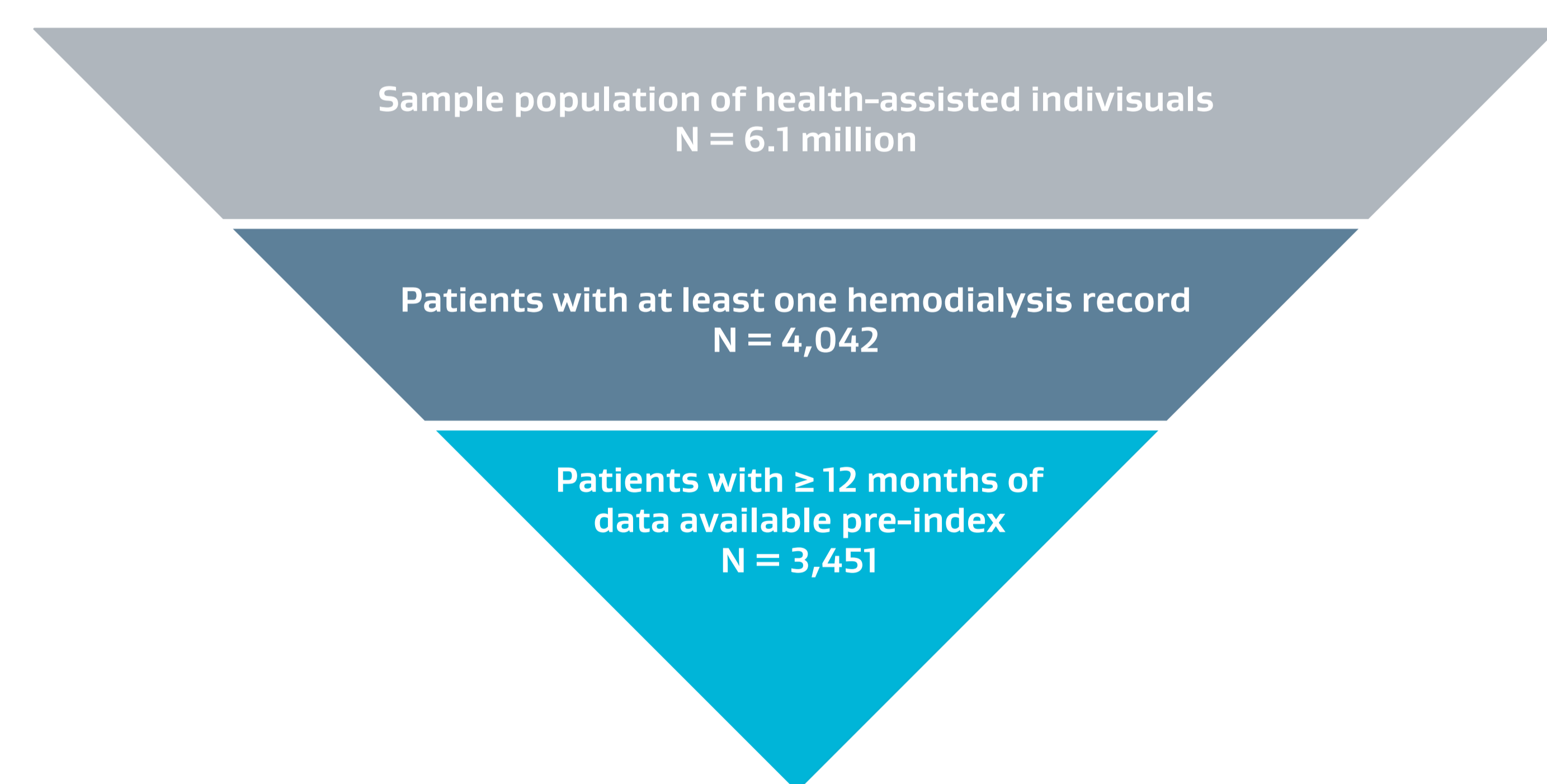
The first hemodialysis record was considered as the index-date; the vascular access types (CVC, AVF and AVG) were evaluated during all the period of data availability before and after the index-date.

RESULTS

Description of study population

From a sample of the Italian population of 6.1 million individuals eligible to access health care system, the analysis included 3,451 hemodialysis patients (Figure 1). Among them, 61.7% were males, and the mean age was 68.7 years.

Figure 1 – Flow-chart for the identification of the study population

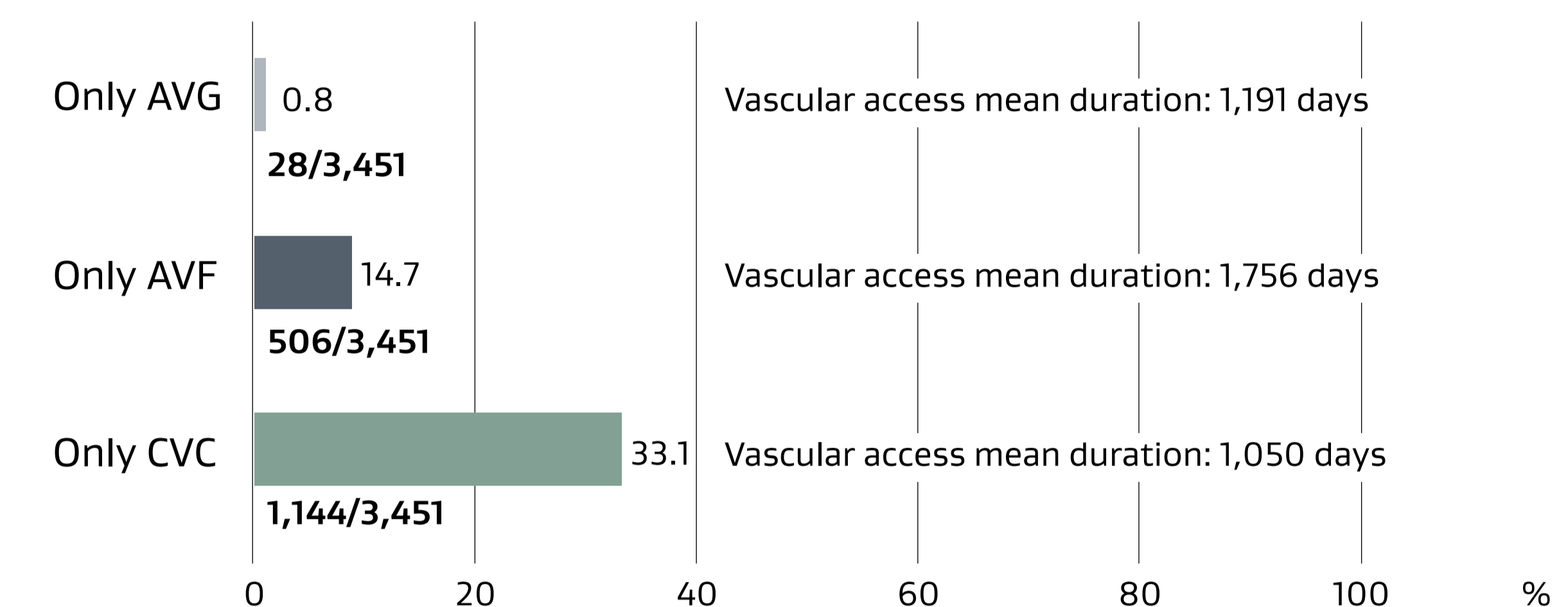


Hemodialysis-related features: evaluation of vascular access patterns

Among 3,451 hemodialysis patients included:

- 17.7% (612/3,451) resulted with no records of vascular access during all available periods (both before and after the index-date) probably due to administrative reasons on vascular access implantation procedure registration;
- 48.6% (1,678/3,451) had a single vascular access implantation (Figure 2): 33.1% CVC only; 14.7% AVF only; 0.8% AVG only.

Figure 2 – Distribution of hemodialysis patients with one single vascular access implantation by type and mean duration of each implantation (in days)



33.7% (1,161/3,451) of patients received more than one vascular access type and among them:

- 24.9% (862/3,451) were implanted with both CVC and AVF and:
 - 14.5% (502/3,451) started with CVC followed by AVF (after a mean of 218 days) and
 - 10.4% (360/3,451) started with AVF followed by CVC (after a mean of 664 days).
- 0.8% (26/3,451) had CVC-AVF-AVG pathway (after a mean of 169 and 439 days, respectively).
- 8% (273/3,451) of patients were characterized by a high number of different/multiple vascular access patterns and were thus classified as minor representative patterns.

Vascular access duration

Among patients who switched vascular access, the mean (\pm SD*) duration of the first vascular access was (Figure 3): 533 \pm 768 days for CVC; 913 \pm 936 days for AVF; 688 \pm 846 days for AVG.

Figure 3 – Mean duration of the first vascular access, from its implantation up to vascular type switch, or renal transplant or death

CVC duration mean 533.3 (SD: 768.5) days
AVF duration mean 913.0 (SD: 936.2) days
AVG duration mean 688.0 (SD: 846.0) days

Stop: Vascular access switch or renal transplant or death

Focus on AVG

Of 191 (5.5%) patients who had at least one AVG as vascular access: 47% (N = 90) started with AVG and 53% (N = 101) had AVG after an AVF or CVC.

CONCLUSIONS

This real-world analysis shows vascular access types used in hemodialysis patients in Italy. Almost 50% of patients had a single vascular access implantation, almost 25% alternated CVC/AVF and 5.5% had at least one AVG. These results could be informative on the management of hemodialysis patients in clinical practice in Italy.

* SD: Standard deviation.

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