

Publication Brief

A Review Article: Access recirculation among end-stage renal disease patients undergoing maintenance hemodialysis

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BACKGROUND

Recirculation in an arteriovenous (AV) fistula among hemodialysis (HD) patients markedly decreases adequacy of dialysis and contributes to lower survival¹. Therefore, periodic assessment of dialysis access recirculation has important diagnostic implications.

OBJECTIVE

To summarize observations about clinical significance of recirculation, its causes and the most common techniques for measurement.

METHODS

Current literature sources (PubMed, Current Content, Scopus, Embase, and Iranmedex) were examined to collect recirculation data.

RESULTS

Access recirculation was defined. Because of its profound clinical significance, the reviewers warn that any access recirculation among HD patients should be considered abnormal. Ultrasound dilution was described (erroneously noting that the lines need to be reversed before the saline injection) as one of the two most common recirculation measurement methods, along with calculations using the urea-based method despite its inherent calculation pitfalls. The cited causes of access recirculation were stenosis, inadequate arterial blood flow rate, close proximity, or misdirection of arterial and venous needles placement by HD staff. The most common cause of access recirculation is the presence of high-grade venous stenosis, especially in new vascular accesses due to the staff's lack of familiarity with the access anatomy.

CONCLUSION

Access recirculation can lead to significant inadequate dialysis, thereby resulting in reducing the survival of HD patients. Therefore, periodic assessment of access recirculation should be standard.

DISCUSSION TAKE HOME POINTS

- The two most widely used methods for accurate assessment of access recirculation are nonurea-based ultrasound dilution and two-needle urea-based (or chemical) method. Three-needle peripheral vein method for measurement of access recirculation should not be used.
- Any access recirculation should be considered abnormal. If recirculation exceeds 10% by the urea-based method or 5% by ultrasound dilution, it should be followed by prompt investigation to discover its causes.
- Fistulography should be performed in the presence of elevated levels of access recirculation to determine whether stenotic lesions are impairing access blood flow.

¹US: 40-44 yrs. of age: mean survival is 8 years; 60-64 yrs. of age: mean survival is 4.5 years.

Iran: One, three and five-year survival for chronic HD patients is 89.2%, 69.2% and 46.8%, respectively.

REFERENCE

Zeraati A, Beladi Mousavi SS, Beladi Mousavi M, A review article: access recirculation among end stage renal disease patients undergoing maintenance hemodialysis. Nephrourol Mon. 2013 Spring;5(2):728-32.