

REGIONAL CITRATE ANTICOAGULATION USING A CALCIUM-FREE CITRATE-CONTAINING DIALYSATE IN CHRONIC HEMODIALYSIS

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INTRODUCTION

Regional citrate anticoagulation (RCA) is a classical alternative to heparin use in acute hemodialysis.

Its implementation is laborious in chronic hemodialysis.

AIM OF THE STUDY

This **feasibility and safety study** describes a new simplified RCA technique using a calcium-free citrate containing dialysate in chronic dialysis.

Primary outcome : success rate
(% sessions finished at the expected time without circuit coagulation)

CONCLUSIONS

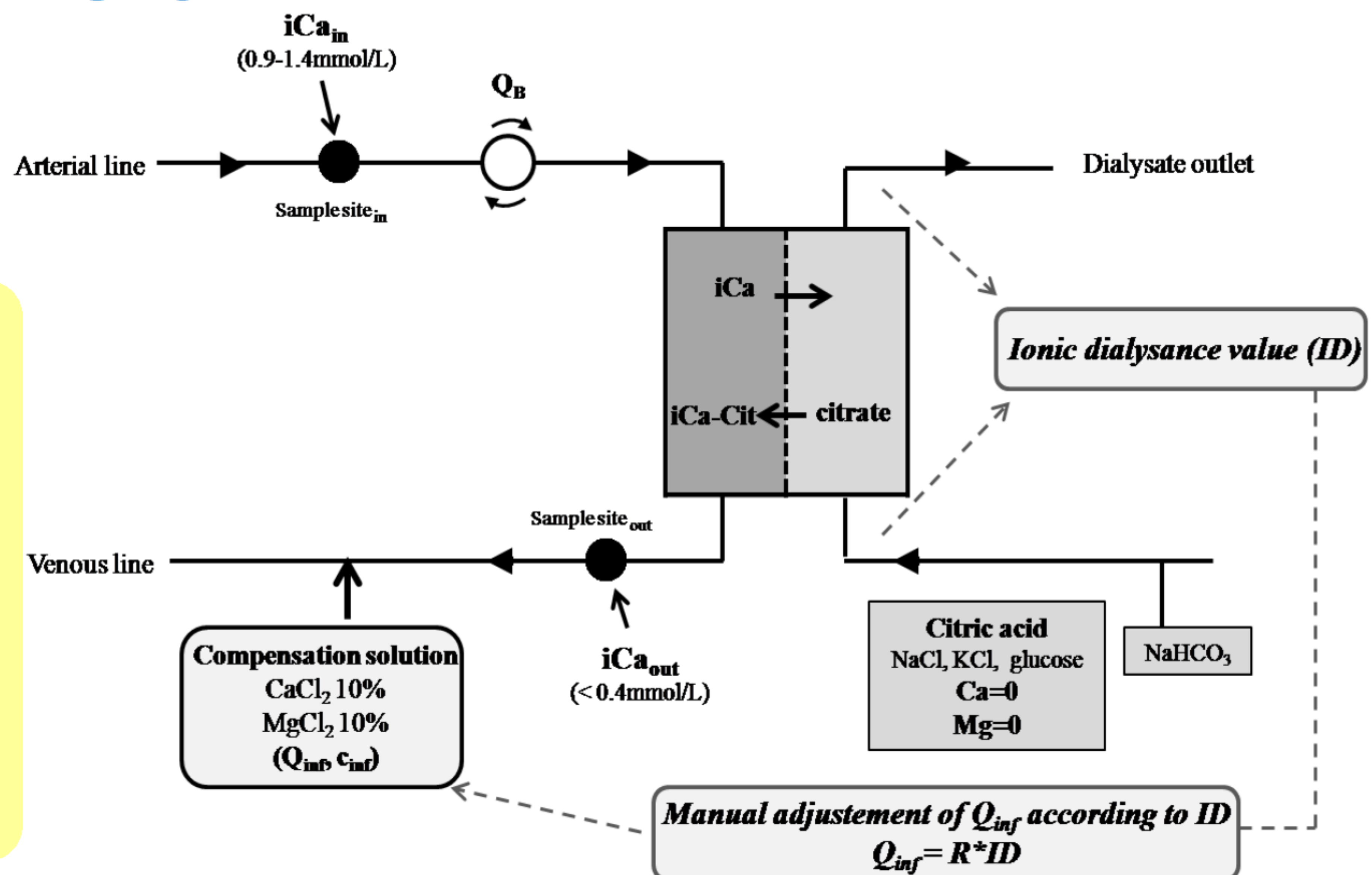
This **new simplified RCA technique** in chronic hemodialysis is **effective and safe**.

The development of a system to automatically adjust calcium injection according to the ionic dialysance should allow to implementing this technique in routine clinical practice.

METHODS

Description of the new simplified RCA technique using a calcium-free citrate-containing dialysate :

1. The **diffusive transfer of citrate** from the dialysate to the blood avoids the requirement of citrate infusion into the arterial line.
2. The adequate **infusion rate of calcium** into the venous line is precisely determined in real time (according to a kinetic model) by **adjusting** it to the **value of ionic dialysance** on-line measured by the dialysis monitor.



PATIENTS AND DESIGN

17 chronic hemodialysis patients

50 RCA heparin-free sessions
Q_B at 300, 350 and 400 mL/min
Duration 4h

VS

27 control sessions
(classical HD with heparin use)

RESULTS

EFFICIENCY

- **Success rate = 98% (49 of 50 sessions)**
- All ionized calcium (iCa) at dialyzer outlet are under 0.4mM (threshold for effective anticoagulation)

SAFETY

	T0	T240	p
Patient iCa_{in} (mM)	1.00±0.08	1.16±0.08	<0.001
totCa (mM)	2.21±0.19	2.58±0.21	<0.001
pH	7.43±0.05	7.50±0.05	<0.001
HCO₃⁻ (mM)	19.9±2.34	24.9±2.53	<0.001
Citratemia (µM) (only 28 sessions)	13.4±13.38	52.9±38.94	<0.001

- **All patient iCa** are between **[0.94-1.38mM]** (physiological range)
- **No citrate side effect** (values under the pathological threshold of 130µM)
- **No severe alkalosis**

RCA vs control

- No difference is observed for clotting parameters (circuit pressures, coagulation score)
- The increase of patient total calcium is similar in the 2 groups.
- No difference is observed concerning the depuration parameters.

