

Heparin Free Acute Dialysis Using Citrate Dialysate

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Background:

Heparin Antibody

A hospital patient, with an antibody to heparin, received acute dialysis using regional citrate anticoagulation. Outpatient dialysis with regional citrate was unavailable. A newly approved citrate dialysate (DRYalysate, Advanced Renal Technologies, Kirkland, WA) was successfully used for heparin free dialysis. Subsequently, eleven acutely ill patients with bleeding risk, who generally clotted when using regular dialysate without heparin, were switched to citrate dialysate. Data is presented here comparing the treatment results.

Anticoagulation In Acute Hemodialysis

Acute dialysis patients with

- active bleeding,
- a high risk of bleeding, or
- with a heparin antibody

present a major treatment challenge because heparin free dialysis is frequently complicated by clotting.

The most prevalent alternative methods in clinical practice when heparin is contraindicated include;

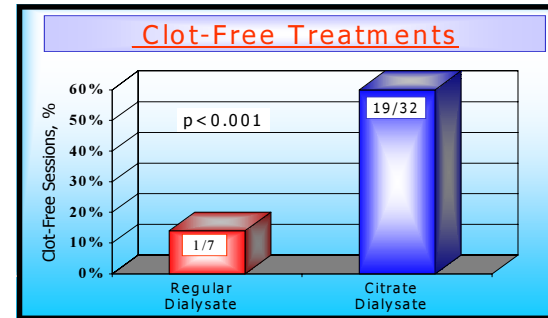
- 1) Regional citrate anticoagulation is effective and well tolerated. It is expensive and complex, requiring close monitoring by the dialysis staff. This method is not compared here.
- 2) Periodic rinsing of the extra-corporeal system with saline has limited efficacy, generally increases the patients fluid load and extends the time required for dialysis.

Since DRYalysate contains citric acid, an anticoagulant, we wanted to assess its effectiveness in conducting heparin free dialysis.

Subjects & Methods:

- N = 11, Acutely ill ICU patients:
 - Heparin Antibody 3
 - Risk of /Active Bleeding 8

Regular Dialysate, N = 7
Citrate Dialysate, N = 32



Summary:

Most heparin free dialyses with regular dialysate could not be completed.

In the same patients, dialyses with citrate dialysate were significantly more successful (p=0.001).

Citrate dialysate was associated with less clotting.

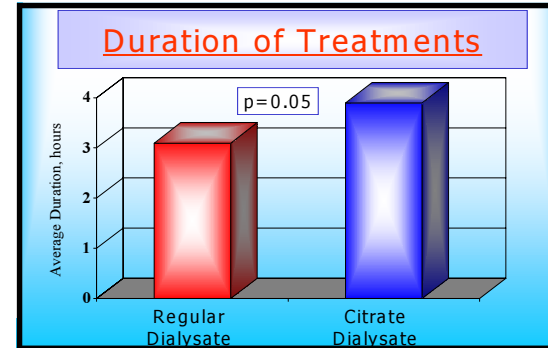
Dialyses with citrate dialysate were of longer duration than with regular dialysate.

No complications were noted with citrate dialysate, even in patients with poor liver function (transplantation).

There was no decline in serum calcium.

Composition of Two Dialysates (Differences Highlighted)

Chemicals	Regular	DRYalysate
Na (mEq/l)	137	137
K	0-4	0-4
Ca	2.5/3.0	2.5/3.0
Mg	0.75	1.0
Cl	~105	~105
Dextrose	200	200
Citrate	0	2.4
Acetate	4	0.3
HCO3	37	37



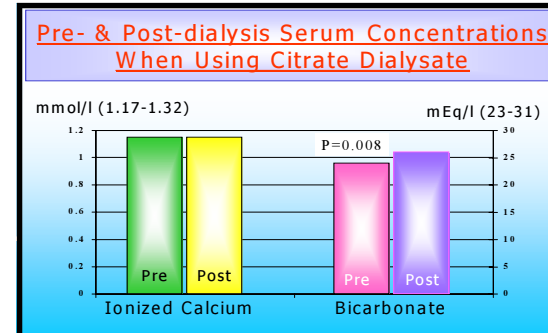
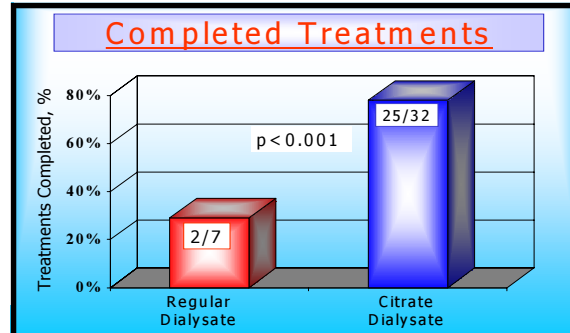
Conclusions:

Citrate dialysate was significantly better than regular dialysate for heparin free hemodialysis in acute patients.

Citrate dialysate was well tolerated and no side effects were noted.

The presence of citrate in dialysate may help prevent the clotting of dialyzer fibers.

Citrate dialysate appears to be a safe and effective alternative when heparin cannot be used in high-risk acute patients.



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