Transcript Details

This is a transcript of a continuing medical education (CME) activity. Additional media formats for the activity and full activity details (including sponsor and supporter, disclosures, and instructions for claiming credit) are available by visiting:
https://reachmd.com/programs/cme/clarifying-the-myth-phosphate-removal-during-dialysis/29524/

Released: 01/10/2025
Valid until: 01/10/2026
Time needed to complete: 54m

ReachMD
www.reachmd.com
info@reachmd.com
(866) 423-7849

Clarifying the Myth: Phosphate Removal During Dialysis

Announcer:
Welcome to CME on ReachMD. This episode is part of our MinuteCE curriculum.

Prior to beginning the actvity, please be sure to review the faculty and commerical supprt diclosure statements as well as the learning objectives.'

Episode 5

Dr. Hill Gallant:
Hello. This is CME on ReachMD, and I'm Dr. Katie Hill Gallant. Here with me today is Dr. Steven Fishbane.

Steven, what is going on during dialysis in terms of phosphate metabolism?

Dr. Fishbane:
Dialysis is one of the three important components for trying to keep phosphorus under control. I always try to think of it as diet is one important part. The use of phosphate binders or phosphate absorption inhibitors, certainly a second important part. And then there's dialysis, which actually, I think we probably don't speak as much about as we do the other components of trying to keep phosphorus under control. It's clear that dialysis by itself is not sufficient. A really good 4-hour dialysis treatment can perhaps remove about 1000 mg of phosphorus. And three times a week, 3000 mg, it's never going to be able to keep up with patients that are taking in 5000, 6000, 7000 mg per week of phosphorus. So dialysis is not going to be effective by itself. It's, of course, why we use medications and diet to try to keep phosphorus under control.

So why is it that dialysis is not effective for being able to remove sufficient phosphorus? And phosphorus is a small molecule, it should be very dialyzable. But of course, it's not just the size of molecules that matters, it's also how accessible is the molecule. And the issue with phosphorus is, I think, the viewers are very well aware, is that it tends to be intracellular, it's not readily available in the extracellular compartment. There's some in the bloodstream. Of course, we can measure serum phosphorus, but the majority of phosphorus in the body is intracellular. As such, it's not immediately available to be dialyzable.

So what happens during hemodialysis treatment is, during the first 2 hours you're really removing what is the phosphate that is available within the serum component. After you've cleaned that compartment, there's less ability to remove phosphorus, and it really depends on the shifting of phosphorus from cells into circulation, and hemodialysis is just not effective enough. Can you do high-flux dialysis? Still doesn't remove enough phosphorus. There's some evidence that hemodiafiltration tends to be somewhat better.

But ultimately, I think what we've learned is that in some of the studies of longer dialysis treatments, for example, overnight dialysis or 8-hour dialysis treatments, there probably is then enough time to be able to get at that intracellular compartment.

But the take-home point is conventional hemodialysis is just not sufficient to be able to remove enough phosphorus, and we do need diet, we do need phosphate binders and phosphate absorption inhibitors.

Dr. Hill Gallant:

Yeah. And I think too of how there is another huge source of phosphorus within the body, and that's from the bone. And things that are happening with bone metabolism are contributing to that serum phosphate, whether it's a dynamic bone or a high bone turnover that are affecting serum phosphate, and not just what's coming in from the intestine.

Dr. Fishbane:
Yeah, there's dietary phosphorus, which is filling the pool, so to speak, of phosphorus every day. And other electrolytes are easier because they're readily available and accessible in circulation. They can be dialyzed more freely. Phosphorus though, through intracellular phosphorus, skeletal phosphorus, it's just not as bioaccessible and bioavailable for dialytic clearance. Thank you.

Dr. Hill Gallant:
Well, this has been a great discussion. Thank you, Dr. Fishbane, and thank you for our listeners today.

Dr. Fishbane:
Thank you.