Helping Kidney Stones Pass: Use of Alpha Antagonists – Frankly Speaking EP7

Transcript Details

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Dr. Frank Domino

This is Frankly Speaking and I am your host, Dr. Frank J Domino. I'm a family physician and professor at the University of Massachusetts Medical School in Western Massachusetts. With me today is my good friend, Dr. Alan Ehrlich. Dr. Ehrlich is an Associate Professor at the University of Massachusetts Medical School and Executive Editor of DynaMed, an online, evidence based database. He is former chair of Family Medicine at St Vincent's Hospital. And today we're going to talk about a very common problem, kidney stones or the proper term is actually urolithiasis. Thanks for coming Alan.

Dr. Alan Ehrlich:

Thanks Frank. So I had heard that there was a recent article about treatment of kidney stones and it got me thinking. So let's take a typical scenario. You have a 45-year-old male who presents with left, colicky flank pain, the urine shows some blood, and he's otherwise stable. Maybe you get a plain film X-ray that shows a calcific density consistent with a kidney stone, and you're thinking about, "Alright. What are the treatment steps?" What are the options that we have in... What does this new study have to say about that?

Dr. Domino

So traditionally, stones can get stuck anywhere in the tract, from the kidney, ureter, sometimes in the bladder they'll remain and rarely in the urethra, and terribly painful as we know. We've all seen patients with kidney stones. A number of options have been tried over the years to see if

you could help facilitate their passage. Typically we recommend drinking a great deal of water, pain control, that sort of thing. For some years now, there's been a little bit of data about the use of calcium channel blockers. And there's a fair amount, but a small amount of data that shows that they might be effective in certain circumstances. The paper I wanted to discuss today is from the British Medical Journal in 2016, that was a large, systematic review in meta-analysis, that looked at the use of alpha antagonists on ureteral stone passages. It was a large study looking at 55 randomized control trials, where the risk of bias was relatively low.

And they found that the two common alpha antagonists used, Alfuzosin and Tamsulosin were effective in a subset of patients. And when they drilled down that subset of patients tend to be patients who had stones that were 5 millimeters or larger. They found that using these agents facilitated passage, almost increasing the passage rate by about 50%, giving you a number needed to treat of four. Larger stones had the highest rate of passage beyond control. And what was really interesting, was that it didn't matter where the stone was in the system, using these agents overall helped facilitate their passage. The study showed some other outcomes that I think were really important.

It decreased the time to stone passage by as much as almost four days, the pain scores went down a little bit, as did the risk for hospitalization or surgical intervention. What didn't happen was that smaller stones did not pass any faster. And the authors thought that those stones were likely to pass on their own as long as we had provided some other conservative treatment. And so the use of a medication in those cases was probably not warranted. Now that raises the question, "How do you decide how big the stone is?" And you mentioned getting a flat plate of the abdomen, which can give us an idea of where there might be a calcification in the general region of the urinary tract. More commonly, emergency rooms use ultrasound or cat scans. And a cat scan will give you the exact location, but still is not great at estimating the largest diameter of the stone.

An ultrasound also helps identify a location, can look at whether the stone is obstructive and causing any possible kidney damage, but again, is not terribly great at identifying greatest stone

diameter so this is an imprecise science. I think if you have a tiny, little calcification, this study probably tells us the addition of an alpha antagonist to our current treatment is probably unlikely to be beneficial. But if you have a stone that seems relatively large in at least one imaging study, possibly, there's some good benefit. What was also interesting was that there was no increased risk of adverse events when all of these studies were reviewed. When we think of alpha antagonists, we think about their ability to lower smooth muscle tension and in short, that means lowering blood pressure. So the obvious risks associated with that are things like orthostatic hypotension, which is by far their most common adverse effect. Dizziness, headache, and fatigue are also common. But as I said earlier, interestingly, there was no increase of adverse effect in this large, systematic review.

Dr. Ehrlich
So to summarize then, it sounds like using these alpha blockers, may be helpful for somewhat larger stones. Could you just give a little bit more about how to clinically apply that information? What kind of dosages they use or you would suggest?

Dr. Domino
I think the first thing is to look at the patient and make sure they're stable and make sure there's no other complicating factors. They're not septic, they're not febrile, they're not hypotensive. Assuming those things are ruled out, then you can probably use the medication where you have some imaging study were you think the stone's relatively large, and that it's not so obstructing that it's causing a hydronephrosis. Tamsulosin is dosed at 0.4 mg once a day. Alfuzosin is dosed at 10 mg a day. I use the former more than the latter just because of my own sense of confidence with the medication and I normally tell patients that when they take it, they need to be very careful standing up and if they feel dizzy or lightheaded to sit down or even become supine, taking it in the evening, when they're going to be in bed, is probably just fine, but if they get up during the night to urinate, to please sit on the side of the bed before getting up quickly.

The medication can be stopped once the stone has passed and patients are pretty good at identifying once the stone has passed because A, when the stone passes it's not subtle, and

especially for larger stones, patients feel a fair amount of discomfort that it's moved to a new place. And B, the stone itself causes obstructive pain and that obstructive pain, as what you said earlier, is colicky, tends to remit. And they've suddenly realized, they're not getting that pain and they feel better.

Dr. Ehrlich
I think that's really helpful in managing the patient with acute renal colic. One of the things that comes up in any patient with kidney stones is they'll say, "Doc, why did I get this?" They may talk to family members who say, "Well, it's because you did one thing." Or, "Your diet is in such a way." Can you review for us what causes kidney stones? Some basic background about them? Risk factors, things like that.

Dr. Domino
Sure thing, Alan. It's a really interesting question that after I read the study, I actually had to go review myself. Kidney stones or urolithiasis is some form of a metabolic imbalance combined with dehydration. So we should keep in mind that it's some internal physiology that's increasing this risk plus our own personal habits that may facilitate it. The most common type of stone is calcium oxalate and lots of foods have high amounts of calcium. So why do some people get stones and others don't? We don't know. Why does it run in some families? We don't know. But we do know 20% of patients who develop urolithiasis have a family history. There also appears to be an environmental effect. It's very interesting when a patient has been diagnosed with urolithiasis, family members have higher rates of calcium excretion than the general population. So these are people who don't have kidney stones also have high urinary calcium levels and it makes you wonder is there some food habit or other environmental factor that's playing a role.

We need to remember that taking these medications help address the acute, clinical syndrome, the pain and the risk for hydronephrosis but they're not a cure all. They're to be implemented only after the problem exists. They will help the stone be passed faster and reduce some pain and reduce the risk for things like hospitalization or surgery, but once that's passed, you don't need to necessarily stay on the medication. What I do like to talk to patients about are that there

are, with any clinical situation, there are risk factors that you can change and risk factors that you can't. For instance, you're born of the family you're born with it and so you carry that risk, but there are things you can modify in your day-to-day routine that can have a significant impact. Most importantly, it looks at things that we think about from other clinically important lifestyle issues.

First, is carbonated drinks. We have no clear understanding why carbonated drinks increase the risk of kidney stones. There's a number of theories about what's been placed in to cause the carbonation and phosphorus but the reality of the matter is there's no clear understanding of why carbonated drinks increase the risk of kidney stones. So the first thing you want to tell your patient to help prevent their recurrence of their kidney stone is to drink no carbonated drinks.

Sedentary lifestyle, obesity, are two areas that also correlate highly with recurrent kidney stones and should remind our patients that just for life in general, you need to get up and move more. Dehydration plays probably one of the most significant lifestyle modification roles for patients. We tend not to drink enough water. We tend not to keep our excretion systems highly active. More and more with people being very, very busy in their work life, they often won't stop to urinate on a regular basis and so they tend to naturally drink less water and drinking less water seems to increase the risk of stones.

Finally, high protein diets and diets high in refined carbohydrate also correlate with an increased risk of kidney stones. So to summarize, the same lifestyle recommendations we give our patients who are at risk for heart disease or diabetes apply here. Don't be sedentary, lose weight, don't become obese, eat a diet that's moderate in all areas, really limit refined carbohydrates, and in particular limit your access to carbonated drinks.

Dr. Ehrlich
Great, Frank. So to summarize, so if I've got this person with colicky pain, we can try these alpha blockers to help the stone pass, I can give advice on lifestyle to prevent recurrence, but what happens if the patient is still symptomatic after a period of time? How do I know when I should

refer or right up front when I get let's say the CT imaging, what are the indications for referral for other types of treatment?

Dr. Domino

Well, I think in the acute setting you want to look for obstruction. If the patient's creatinine is creeping up or the kidney looks like it's developing hydronephrosis, you need to really decide how long you can tolerate that clinically as well as chemically. So you probably need to involve a urologist at that time. There are a couple of other areas where involving a urologist early on in the care of a kidney stone is critical. That's when the patient's obviously developing acute renal failure, when your ability to manage the pain is quite limited, and in particular in a pregnant woman. These are areas where the risks of managing a kidney stone conservatively can be quite great. You think about the pregnant woman and pyelonephritis, you think about the patient with heart failure or the patient who has limited creatinine clearance. If you increase their creatinine, if it doubles, say it goes from 0.8 to 1.6, as a clinician, we need to remember that that patient's lost 50% of their ability to excrete urea and all the other components of urine. So that's worrisome, it needs to be addressed quickly.

How do we decide on conservative management? Well, we know that most stones will pass within two to four weeks but that's a fairly long time of misery, so I think clinically I'll treat someone conservatively as long as their pain is well controlled and they're able to drink a great deal of fluids and they don't appear ill, there's no adverse effects occurring, I'll watch them for five to seven days. If after five to seven days they don't seem to be getting better I might reimage or if they get even a little bit worse, I might involve a urologist.

Dr. Ehrlich

Alright. So are there any other treatments that you want to talk about or any other thoughts about managing urolithiasis?

Dr. Domino

Sure. I think the first thing is to remember that the vast majority, probably at least 75% of stones, will pass on their own and do not require surgical intervention. But once a person has a urolithiasis event, their risk of having another one is about 50%. They tend to recur. So your involvement as a clinician is great here. You need to remind them of the things they can do to prevent the recurrence. Most importantly is increase their hydration status. Sometimes I'll say to patients, "When you urinate, you want the urine to be a pale yellow. You want it to be barely yellow at all." If it's any darker than that, that's a crude estimate of their hydration status and encourage them to drink more fluids. Be careful with carbonated fluids, we know that they have a strong correlation with kidney stones and be careful with diuretics, things that are full of caffeine. One or two cups of coffee a day correlates with many improved outcomes, but eight cups of coffee a day might be excessive and certainly I know in the medical profession many people that'll drink large amounts of caffeine. The caffeine itself isn't necessarily bad but it increases diuresis and that increases the risk of dehydration.

So one of my advice to people who are high caffeine drinkers is that for every caffeine exposure have a water exposure, keep their urine up. When someone has a kidney stone, I always ask them to strain their urine and try to collect the stone. And I think many of us just sort of let this one component go. The reason it's important is that if we can identify the stone we might be able to find ways medically, to either dissolve that stone when it's present or give them medication that will decrease the risk of recurrence, so have strainers in your office if you can. If you can't, you can have them pick up one at their local pharmacy, collect the urine. As soon as they find some sediment bring it back in. It doesn't need to be handled in any sanitary or sterile manner, and send it off for a stone analysis. Most kidney stones, once you've had one, will recur and so keeping patients' lifestyles a primary focus can help decrease that risk and certainly once it occurs they can become a bit more aggressive in it's management.

Dr. Ehrlich

Great, very informative, Frank. Thanks.

Dr. Domino

Thank you Alan. I appreciate your coming today and participating in this discussion. I'm Frank Domino with the University of Massachusetts Medical School and you've been listening to Frankly Speaking. We hope to see you again soon.