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## Male Infertility Insights: Causes, Diagnosis, & Treatment

Dr. Paul Doghramji:

Even though the male partner can contribute in up to 50% of all infertility cases, there is still much more research to be done as many cases receive an unknown cause diagnosis. So, how can we get better at identifying infertility and its causes in our male patients?

Welcome to SexMed on ReachMD. I'm Dr. Paul Doghramji and joining me today is Dr. Alexander Pastruszak, Assistant Professor at the University of Utah School of Medicine. Dr. Pastruszak, Alex, welcome back and thanks for joining us today.

Dr. Alexander Pastruszak:

Paul, thanks so much for having me. It's great to be here and I'm really looking forward to this topic. It's one of my favorites.

Dr. Paul Doghramji:

Absolutely. So, let's get right to it. So, why don't you start off by telling us what male infertility is and how it's defined.

Dr. Alexander Pastruszak:

Yeah, that's a great question. I think we just need to take a step back and talk about infertility in general, because infertility is a couple issue, it's not necessarily one or the other, it's really how the two come together that defines it as a problem. So, by definition, infertility is when a couple, after having regular, unprotected intercourse, can't initiate a pregnancy after doing that for 12 months or more. That's basically the definition of infertility.

Dr. Paul Doghramji:

Okay. So, the causes, of course, can be a lot more challenging. Can you get into that please?

Dr. Alexander Pastruszak:

Yes, absolutely. So, in terms of how infertility breaks down between the man and the woman, you know, back in the Dark Ages women's heads literally would roll if they couldn't produce a son or daughter for their husband because everybody attributed infertility solely to the woman. Only more recently do we realize that the male has a significant contribution and, as you said in the introduction, up to 50% of cases of infertility can be due to the male. There are a lot of causes of male infertility and these can range from genetic causes, which we are still teasing out and that is really where the research is focused, to physical causes, hormonal causes, neuro causes, causes related to prior conditions and, really, it's a longer list that we don't even have time to get through today.

Dr. Paul Doghramji:

So, what you said is that the male infertility is really a couple's issue, so, should, therefore, both males and females be evaluated? Is that what you're getting at?

Dr. Alexander Pastruszak:

Yeah, and that's such an important point to make, Paul. The reason for that is, like I said, 50/50 right? Up to 50/50. So, really, when we look at our professional guidelines, both in the U.S. and in Europe, they recommend that both the male and female are evaluated together, simultaneously. The problem is that typically the woman gets an evaluation because women actually still drive a lot of health care here in the United States; men are a lot more reticent to actually go get care, and then sometimes the man will be evaluated. It's such a problem that only 9% of men with potential fertility issues get evaluated. That means that 91% of men that may be contributing to infertility don't actually have an evaluation.

Dr. Paul Doghramji:

Alright, so now that we've defined what male infertility is, is the diagnosis as simple as doing a sperm count, or what are some of the

causes and what are some of the incidences of male infertility?

Dr. Alexander Pastruszak:

You mentioned sperm count and, as we were talking, I realized we haven't talked about what we actually do to evaluate guys and we may talk about that a little further down the road, but, typically, we look at a guy's sperm count, we do a physical exam, and we look at his hormones. We can get into the weeds in a few minutes, but what that helps us define are some of these causes. Some of the most common things that we see tend to include, like I said, physical causes earlier, so this could be obstruction, sperm that can't get to where they're going; varicoceles, which are essentially varicose veins of the scrotum and, believe it or not, even having that on one side can cause significant changes in sperm production; genetic causes, and this is actually probably an underappreciated hormone cause. So, if you're hormones are off, meaning like testosterone is too low, estrogen is too high, and some other things, that can cause poor sperm production. If you've had a history of cancer and have been treated with chemotherapy; chemotherapy is notoriously bad for sperm production and a lot of chemotherapies can actually permanently cause problems with sperm production, and then other prior surgical or medical issues like congenital abnormalities, prior infections in the testicles, issues with ejaculation, and then surgery that might affect erectile function, ejaculation, etc., you can see I'm trying to keep this short, but I could keep going and this was just the short list.

Dr. Paul Doghramji:

Alright, so that's actually pretty extensive and we all need to know all about them. So, genetic influence, let's talk about that. Is that actually a factor in male infertility?

Dr. Alexander Pastruszak:

A lot of causes of infertility are considered unknown or idiopathic. Right now, we think that up to 50% of those idiopathic causes of infertility are actually genetic. And, just to give perspective to this, to date, about 1,500 genes have been linked to male factor infertility. Now, we don't have a clinical test for all 1,500 of these yet, those are sort of in the works, there are companies that are working on this, but we think there are more genes. In my lab and in a few labs across the country and more across the world, more and more of these genes are being discovered I'd like to say on a daily basis but science doesn't work that fast but we're continuing to add to this list. So, genetic causes are a very significant contributor to male infertility. The problem right now is that when a patient comes in and we suspect a genetic cause, we can only detect far less than 1% of those causes, so it's hard to tell a patient exactly why they're infertile.

Dr. Paul Doghramji:

For those just tuning in, this is SexMed on ReachMD. I'm Dr. Paul Doghramji and today I'm joined by Dr. Alexander Pastruszak and we're speaking about male infertility. So, Alex, continuing on, now that we have a better understanding of what male infertility is and what causes it, can you talk us through what a patient goes through when they're first diagnosed? We kind of touched on this a little bit with semen analysis, but what is the whole process of workup of a patient?

Dr. Alexander Pastruszak:

Yeah and this is really what the patients need to know because, like I said, guys don't want to visit a doctor, so how can we make it accessible to them and have them understand what they're going to go through. So, I will say that a fertility evaluation compared to most interactions with folks who are surgeons, is fairly detailed. It's part of what I like about waking up in the morning and going to work is that I actually get to talk to my patients for a while, get a lot of detail out of them about their history, and get to have a relationship with them over many months and, in some cases, years. But, to answer your question specifically, the most important parts of an initial fertility evaluation include a history. This is very detailed because we want to know about their ability to have sex, any prior pregnancies that they might have initiated or their partner might have had, any past medical history, any conditions that might influence their current fertility, prior surgeries, like I mentioned earlier, there are some surgeries in the pelvis that can affect their ability to ejaculate. If anybody's had prostate surgery, that can affect their ability to ejaculate or the direction in which their sperm can go, and then there's a hormonal analysis and the most important hormones that we look at are testosterone which is very important for sperm production, and then follicle stimulating hormone or FSH because this is a signal from the brain that tells the testicles to make sperm. Obviously, we do a semen analysis and actually the guidelines recommend that doing two initially because guys vary drastically in their sperm counts and other semen parameters, and then, obviously, we do a physical exam to look at primarily their testicles and, in some cases, do imaging and adjunct studies depending on where that initial evaluation goes. I mentioned earlier that genetic causes can be significant but the genetic testing that we have is really kind of in the Dark Ages. There are really two genetic tests that we can offer on a clinical basis to patients right now and those look very specifically at deletions on the Y chromosome which have been tied to infertility in 8 -11% of men and then a karyotype which is like looking at the United States from space. The detail that you get out of that is not very helpful when you look at some of the molecular genetic defects that cause infertility.

Dr. Paul Doghramji:

So you have done a careful history, physical exam, maybe even some testing, you said about 50% of the time though the cause is

unknown, but looking at the known causes, what are the top two or three most likely causes of male infertility?

Dr. Alexander Pastruszak:

Most of the time guys will come in with, so varicocele is the most common surgically correctable cause of male infertility and we see a lot of guys with varicocele, so that's certainly in the top three. A lot of guys will also come in with some hormonal dysfunction, meaning their testosterone levels are a little on the low side, they may have some other hormonal issues that we can potentially fix with medical management. Those are probably the most common things we do in a practice and the easiest to fix in most guys.

Dr. Paul Doghramji:

So, once you've made the diagnosis then what are the treatment options for these different diagnoses?

Dr. Alexander Pastruszak:

So, this is kind of where it gets fun for the physician and the good news for the patient is that no matter the cause of your infertility and, like I said, a lot of times you can't tell exactly what it is, the majority of the time we can treat you one way or another. So, I think that's an important message that patients need to take home. But, to answer your question, often times we'll put patients on medical management and this usually involves drugs that raise their testosterone levels and, another important point to make is, a lot of patients and even some physicians think that giving a patient testosterone is a good idea for infertility, but it's not. Testosterone is actually an excellent contraceptive. So, over the course of a few months, it will actually reduce sperm count sometimes to completely zero. So, we give medications that will stimulate the body to produce testosterone naturally and stimulate the testicles to make sperm naturally rather than inhibiting that. There are surgical treatments as well, like I mentioned, varicocele is the most common surgically treatable cause of male infertility so we very often fix those and that's microsurgery. We can often reverse vasectomies, we can reverse obstructions, these are all surgical treatments. For the men who don't have a medically treatable cause or a surgical treatable cause where we can improve sperm production or sperm transport, we, as urologists, can always work to obtain sperm from the testicles or from parts of the testicle that can then be used for IVF. So, while medical or surgical treatment to help men have more sperm in their ejaculate, may not always be successful, we often times can find sperm in the testes that helps a couple have babies through IVF.

Dr. Paul Doghramji:

So, you said there's quite a bit you can do for patients, do you reassure your male patients that probably you'll be able to get them to conceive?

Dr. Alexander Pastruszak:

That's a tough question to answer. I think it's important for patients to always have hope but, as we talked about in the beginning, it's not just the male, right? I mean, if I find sperm in a male which I will in the majority of patients, even if I have to go into the guy's testicles under microscope in the operating room, that doesn't mean that he can conceive because the other half of the equation is his partner. So, if, on the female side, we're able to get eggs and successfully put the sperm and the egg together, then there's a good chance that they'll be able to get pregnant. But, the wild card is always on the female side once we're able to help the guy. So, to take a step back, you and I both know that in medicine, we can't make guarantees. In the fertility world, I think there's always hope and most guys, most couples actually that I have worked with, can have a child but not everybody.

Dr. Paul Doghramji:

One question, when you say take a step back, that also comes to mind is when a couple is determined to have an infertility issue; they've tried for one year, they can't conceive, do both get tested at the same time, or does the male go first then the female?

Dr. Alexander Pastruszak:

That's a great question. So, actually a lot of times the female initiates the evaluation. So, most of the guys that I'll see in clinic are there because either their partner said, "Hey man, you know I'm getting evaluated, you go get yourself evaluated," or the partner's physician said, "Hey, you know, like you're fine," to the female and then to the guy "You should get yourself worked up" and then even less frequently than that is where we follow the guidelines which is female goes to get evaluated and the physician on that side says, "Well, you know, we don't know what's going on with you yet, we're going to work you up but really, you sir, should also get evaluated." So, it's a complex calculus where, again, the woman usually drives most of the things and it's a minority of the time that the guy shows up in my office and says, "Hey, I'm taking the lead and I'm taking the bull by the horn so let's get going."

Dr. Paul Doghramji:

So, it sounds like a lot of times the infertility workup is happening, at least in some cases, concurrently. Before we wrap up, is there anything we haven't covered that you would like to share with us, Alex?

Dr. Alexander Pastruszak:

I think just to summarize, the take home points for anybody who is listening, whether it's physicians, patient, or anybody, is really that

infertility is a couple issue. So you've got the man and the woman and both need to work in order to conceive. There is good treatment for both male and female infertility. Yes, there are separate groups of physicians, separate fields of medicine, that evaluate the male and the female, but we work very closely together and, once treated, there is a good chance of conception. So, couples who are struggling with infertility shouldn't be discouraged. They should definitely be evaluated and they should take it as far as they can. I think those are some of the key points that I want people to walk away with.

Dr. Paul Doghramji:

Well, Alex, I want to thank you for joining me to talk about male infertility and for helping our audience gain a better understanding about this very important subject. It was great having you back on the program today.

Dr. Alexander Pastruszak:

Paul, thank you so much for having me and for talking about this really important topic. I think it's an underserved area of medicine and I think we all need to know about it and guys need to think about it and get evaluated and treated. So, I really appreciate having the opportunity to chat about it.

Dr. Paul Doghramji:

I am Dr. Paul Doghramji and you've been listening to SexMed on ReachMD. To access this episode and others in this series, visit [ReachMD.com/SexMed](https://ReachMD.com/SexMed) where you can be part of the knowledge.