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

Advances in Parenteral Nutrition: Examining Multi-Source Lipid Emulsions

Announcer:

You're listening to *GI Insights* on ReachMD, and this episode is sponsored by Fresenius Kabi. Here's your host, Dr. Charles Turck.

Dr. Turck:

This is *GI Insights* on ReachMD, and I'm Dr. Charles Turck. Joining me to discuss multi-source intravenous lipid emulsions and their role in parenteral nutrition protocols is Dr. Sarah Cogle. She's a Clinical Pharmacist Specialist at Vanderbilt University Medical Center in Nashville, Tennessee.

Dr. Cogle, welcome to the program.

Dr. Cogle:

Thank you so much for having me on.

Dr. Turck:

Well, let's start with some background, Dr. Cogle. What factors are driving the shift from more traditional or conventional single-source lipid emulsion products to multi-source intravenous lipid emulsions?

Dr. Cogle:

So, for a long time in the United States, we only had one lipid product available, which was 100 percent soybean oil. And when we look back at historical data where we saw negative effects associated with lipid emulsions, they were really associated with that individual product. Now, although soybean oil is a great source of essential fatty acids, it also is associated with more pro-inflammatory effects, which can be difficult if you have patients who are already susceptible to inflammation, such as critically ill patients or patients who are on longer-term PN.

And so, over the last five to 10 years, we have had the advent of multiple other lipid products, which contain a mix of different lipid oils that are likely associated with either immune neutral or anti-inflammatory properties and may lead to overall benefits clinically.

Dr. Turck:

Now, when it comes to multi-source lipid emulsions, how could taking a blended approach to obtaining lipids influence a patient's metabolic, inflammatory, and immunologic responses?

Dr. Cogle:

Well, each of the different components of the mixed oil products play a different role in modulating our physiologic response. So, as I mentioned previously, 100 percent soybean oil is a great source of essential fatty acids, and this is why it's contained in all of the mixed oil products as well. The MCT, or medium-chain triglycerides, in the olive oil are thought to be immune neutral, and they're a good source of calories as well. And then we have fish oil, which is included for its anti-inflammatory effects.

And so the combination of all of these products together can help modulate physiologic responses differently than what we would see with just 100 percent soybean oil products. And they may offer less inflammation than what we would see with just the soybean oil.

Dr. Turck:

And as a follow-up to that, some systematic reviews suggest that multi-source lipid emulsions may be associated with improvements in inflammation, liver function, and metabolic parameters. How do you interpret that literature, and in what ways does it influence your use of parenteral nutrition in clinical practice?

Dr. Cogle:

We're seeing a lot more data come out about these newer lipid products that show less of an impact on our liver function tests and inflammatory markers, although the specific outcomes that we see really do differ depending on the individual study. But looking at your certain patient populations, I think we're beginning to see more and more emerging data that mixed oil emulsions may offer improved outcomes in these patient populations, particularly in our critically ill patients.

Dr. Turck:

For those just tuning in, you're listening to *GI Insights* on ReachMD. I'm Dr. Charles Turck, and I'm speaking with Dr. Sarah Cogle about the clinical rationale for multi-source intravenous lipid emulsions in parenteral nutrition.

So, Dr. Cogle, now that we have some background on multi-source intravenous lipid emulsions, let's talk about their use in specific populations. What potential advantages might these formulations offer for critically ill, postoperative, or hepatically compromised patients compared with more conventional lipid products?

Dr. Cogle:

Well, the inclusion of fish oil specifically as an anti-inflammatory agent can be really beneficial in specific populations, including patients who have just had major surgeries, and also in patients who are critically ill. And some of the things that we have seen in certain studies are that patients have fewer changes in their liver function tests and, overall, just better tolerance from a hepatic standpoint. And so, especially in these patient populations, I would consider the advent or the use of mixed oil lipid formulations instead of the more pro-inflammatory 100 percent soybean oil lipid formulations.

Dr. Turck:

Now, on the other hand, which patient scenarios might warrant additional caution or closer monitoring when ordering multi-source intravenous lipid emulsions?

Dr. Cogle:

We should always have specific considerations for any type of patient who has any sort of known lipid metabolism disorder, any allergy to any of the various components that are in the mixed lipid emulsion product, including fish and eggs, or patients who have any kind of condition which impairs their clearance of lipids.

Additionally, pediatric and neonatal patients require specialized and individualized dosing and close monitoring due to differences in their metabolic processing.

Dr. Turck:

Now, before we wrap up our program, Dr. Cogle, what operational considerations should healthcare teams keep in mind when integrating multi-source intravenous lipid emulsions into parenteral nutrition workflows?

Dr. Cogle:

Implementation of additional lipid products really involves utilization of the entire healthcare team, and that's going to include pharmacy, nursing, gastroenterology, and surgery—really anyone who's involved in the PN use process.

This may involve adding different products to formularies and developing clinical protocols to help you determine what lipid product should be used in specific patient populations, and also making sure that staff are educated and trained to know the difference clinically and just in terms of selecting the right product physically when compounding products to make sure that patients are getting the specific product that you have intended when you're writing the PN order.

We also want to think really closely about compatibility. As we've mentioned, there are multiple lipid products available on the market in the US now, and they all have a distinct compatibility profile. So, when we're considering adding medications to the parenteral nutrition admixture, or if we're thinking about Y-siting other medications with the lipid and PN mixture, we want to make sure that we have good, robust compatibility and stability data for that specific lipid emulsion.

Dr. Turck:

Well, with those key considerations in mind, I want to thank my guest, Dr. Sarah Cogle, for joining me to discuss how multi-source intravenous lipid emulsions may improve patient outcomes in patients receiving parenteral nutrition.

Dr. Cogle, it was great speaking with you today.

Dr. Cogle:

Thank you so much for having me on to discuss lipids.

Announcer:

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