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Insights on COVID-19 from the Frontlines of Italy's ICUs

Announcer:

You're listening to ReachMD, and this is *Vascular Viewpoints*, sponsored by Becton Dickinson, advancing the world of health. In this program, we will be discussing recently updated GAVeCeLT recommendations for vascular access. For more information on the GAVeCeLT study please visit, www.Gavecelt.it

Here's your host, Dr. Matt Birnholz.

Dr. Birnholz:

Coming to you from the ReachMD studios, this is a special COVID-19 edition of *Vascular Viewpoints*, and I'm Dr. Matt Birnholz. Joining me to share insights on the recently updated GAVeCeLT recommendations for vascular access in critical care settings is Dr. Mauro Pittiruti, surgeon and professor at the Catholic University Hospital in Rome. Dr. Pittiruti is Founder and President of the Italian Group of Central Venous Access, an expert consensus group responsible for issuing the internationally renowned GAVeCeLT recommendations that we'll be reviewing today.

Dr. Pittiruti, welcome to the program.

Dr. Pittiruti:

Thank you, it's good to be here.

Dr. Birnholz:

Before we dive in, can you provide an overview of your work with the GAVeCeLT team of experts and the recent conditions in Italy that led to your updated intensive care recommendations?

Dr. Pittiruti:

Well, our document really was borne from the experience of many of our colleagues and physicians and nurses who were working in this emergency in different hospitals in Italy, because while the thing was getting more and more severe and more tragic, I would say, we were learning on the field some very important conflicts. And some of us focused on some aspects, some others focused on other aspects, but at the very end we tried to put together the lessons that we learned in the field on the different diagnoses, the level of the choice of device, the insertion technique, the maintenance technique and the protective measure during the insertion, so we make an effort to note which are the most important point that we would like to participate to share with doctors.

Dr. Birnholz:

That's a great setup, Dr. Pittiruti. Why don't we then focus on device selection highlights from the recommendations which take into account some unique challenges in the ICU for COVID patients. And starting with peripheral venous access devices, such as midline catheters, your team reported an issue with this approach when patients needed ventilation support. Can you speak to that problem?

Dr. Pittiruti:

Yes. So we have discovered that peripheral venous access was practically enough, was sufficient for hydration and supportive therapies in patients who were not in intensive care unit but who were patients anyway who were not intubated, who were not going through noninvasive ventilation, etc. And coming to the choice of this peripheral venous access device we found out that the best strategy was to reduce the number of procedures. If you are using a short peripheral cannula—a PIV as they call it in USA—then you have to probably replace it very frequently, every 2 or 3 days, and to multiply the number of procedures is something that you absolutely do not want in the COVID patient, so it's much better to put a midline catheter which will stay for days and weeks and doing the

procedure just one time. Also, the midline catheters that we use in Europe, which are quite long, they typically allow very good blood sampling. Of course, there's always the possibility that patient gets worse, and in this case we are replacing midline catheters or guide wire with a peripherally inserted central catheter before getting the patient into intensive care unit.

Dr. Birnholz:

And there were problems with compression of the axillary veins whenever dealing with the potentiality of adding ventilation support. Isn't that correct?

Dr. Pittiruti:

Yes, exactly. That was another very important point. We found out that the helmets that are used for CPAP, or in general speaking for noninvasive ventilation, if attached under the axilla may compress the axillary vein. Some of these helmets have the tight straps under the armpits so to speak. It's not absolutely a universal concept because there are also helmets which stay in place autonomously and other helmets which are maintained in place through straps which go to the bed, for instance, but when the straps are under the armpits, there's inevitably a compression of the axillary vein. And this maneuver is always associated with edema and the risk of thrombosis regardless of whether there is a venous access or not, but any time you have a peripheral venous access in the arm, you increase the flow by the infusion that you deliver. When there is venous stasis, then you have risk of thrombosis. In these patients we found that it was much better to have the peripherally inserted central line, which will deliver after the compression of axillary vein in the central veins or even to use a femoral line.

Dr. Birnholz:

And I want to touch upon those because we're turning to central venous access, which is the next logical step here in intensive care, and I was struck by some of the special considerations for using peripherally inserted central catheters in COVID patients. There were a number of considerations: insertion safety factors, anticoagulation protocols.

Dr. Pittiruti:

Most of these patients were anticoagulated, severely anticoagulated, and you know that when you have a patient who has severe anticoagulation, a PICC insertion is relatively free of risk; but on the contrary, a direct puncture for a central line, such as in the jugular, subclavian, axillary, or brachiocephalic, might be associated with a risk of local complication, which can be really also life-threatening, so the safety was an issue, most of all the pulmonary complication. Think of the tragedy of making a hemothorax accidentally during a subclavian insertion to a patient which already had a critical pneumonia.

But there are other aspects, aspects especially related to the dressing. If I have a dressing of a centrally inserted line in the infraclavicular/supraclavicular area and the patient is pronated, most of his secretions inevitably will soak, will flood the dressing of the central line. And on the contrary, if you have a femoral line or a PICC, this will not happen. I say that in standard condition very often a line which is inserted in the neck or supraclavicular/infraclavicular area is wet because of secretions, but the secretions of the COVID patient are particularly dense.

Dr. Birnholz:

And there were specific thoughts within the GAVeCeLT recommendations on the comparative thrombotic risks between central catheter types in the intensive care unit setting for COVID patients. Can you walk us through some of those considerations?

Dr. Pittiruti:

Yes, there is still a lot of confusion in this area. We don't have data to tell whether in COVID patients their catheter-related venous thrombosis is actually increased as a risk or not. There are many centers who have noticed an increased risk of pulmonary venous thrombosis, and probably this thrombosis which had been into the minor vessels of the lung might have also played important pathogenic role, but we don't have data now telling whether the central lines are more prone to catheter-related thrombosis in these patients.

The confusing factor is the fact that after the first experience everybody realized that the COVID patient intensive care unit needed anticoagulation, so the actual risk of thrombosis was somehow biased by the fact that most of the patients have anticoagulated, but as I told you, there is no hard data telling whether there is an increased thrombosis or not.

Dr. Birnholz:

So, Dr. Pittiruti, let's switch gears then to consider the insertion techniques recommended within these guidelines to better meet the needs of intensive care units dealing with COVID-19, and there were several considerations with respect to insertion techniques, but my first question to you is, as a broad-based question: Should x-rays in intensive care units within this pandemic have any place in confirming proper placement in the absence of pneumothorax, or is ultrasound really the way to go here?

Dr. Pittiruti:

Ultrasound is way to go. Also, in non-COVID patients, if you think of the comparison between what the ultrasound and EKG can give you and what x-ray gives you in terms of reducing the time, reducing resources, increase safety, increase accuracy, reduce the waste of resources, you should always prefer ultrasound-based tip location or intracavitary EKG tip location in any patient, but this becomes even more important in the COVID patient. This is the interesting lesson that we will learn also in the future after this COVID hopefully will be something of the past.

The fact is that in this situation we understood that the idea of doing things faster and with less resources will become incredibly important. As we already mentioned, to have a chest x-ray is not more accurate than ultrasound or intracavitary EKG. It's only more expensive, and I'll also say with more risk of contamination whatever you do it. Either you bring the patient—bring the machine to the patient or you take the patient to the x-ray department. It's still a high risk for the operators of contamination and also contamination of the machine.

Dr. Birnholz:

Well, that was an excellent review, Dr. Pittiruti. But before we go, I want to touch upon what the recommendations called a potentially positive side effect of this otherwise tragic situation, and that's a renewed focus on safety and resource efficiency that you were just talking about. What were some strategies that we can take away from this pandemic to help improve vascular access protocols going forward?

Dr. Pittiruti:

Well, first of all, the concept is that you can improve your vascular access practice by implementing vascular access team of nurses and doctors who are specifically trained and able to insert any kind of device, choosing the device according to the needs of the patient. Extremely important was a gap in the clinical outcome between the centers where the vascular access team—for instance, nurses and doctors—are able to insert midline, PICC and other more hospitals where they had not such knowledge and the only thing they could do is either to insert a peripheral IV or a centrally inserted central line.

Now, if you don't have a wide choice of device, you may be choosing something which might be dangerous for the patient.

I often quote an American proverb, American motto, which you may know better than I do, which says, "When your only tool is the hammer, every problem looks like a nail." If the only thing you can do is to insert a central line by the jugular vein, then you will find patients which this approach is not appropriate. On the contrary, you should do several things, several approaches, several devices with the best technique possible, and this is at its best performed by a vascular access team or more specifically, trained people. That was the first lesson, absolutely. The second is about optimization of the insertion technique, which means ultrasound, intracavitary EKG.

And one thing we did not mention is also the problem of protecting and securing the access site. In Europe, we use a lot of cyanoacrylate glue, for instance, to avoid bleeding. If you put the cyanoacrylate glue at access site of a PICC or a central line or peripheral line, it would stop the bleeding, and you don't have to change the dressing after 24 hours. Now, changing dressing after 24 hours in a known COVID patient, to go back into the room of the patient, it means more waste of resources and more risk of contamination, so a simple thing like putting glue will avoid this.

Dr. Birnholz:

Well, those were fantastic, concrete examples of ways that we can improve across the world our intensive care unit protocols and procedures, the best practices in play that have come from this very, very difficult situation. I very much want to thank my guest, Dr. Mauro Pittiruti, for joining me to review key insights from the updated GAVeCeLT recommendations in response to the coronavirus pandemic.

Dr. Pittiruti, it was great having you on the program. Thanks so much.

Dr. Pittiruti:

Thank you.

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