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# Challenges in the Management of the Critically Ill Patient

Interview with Massimo Antonelli, Prof. of Intensive Care and Anesthesiology, Università Cattolica del Sacro Cuore, Rome Italy

Massimo Antonelli is a Professor of Intensive Care and Anesthesiology at the Università Cattolica del Sacro Cuore, Rome, Italy. He serves as the Director of the Dept. of Anesthesiology and Intensive Care and Emergency Medicine and of the General ICU, Postoperative ICU and Neurosurgical ICU of the Fondazione Policlinico Universitario A. Gemelli IRCCS. He is also the Director of the School of Specialty in Anesthesiology and Intensive Care Medicine. Prof. Antonelli's scientific fields of interest and research include noninvasive ventilation, mechanical ventilation, ARDS, shock, sepsis, and infections. He has been involved as a principal investigator in many Phase II-III clinical and international trials in ICU patients. Prof. Antonelli is the author of more than 300 papers. The majority of these scientific publications are on several aspects of noninvasive ventilation, ARDS, shock, and sepsis. He has been invited as a lecturer or chairman in more than 300 international meetings. Prof. Antonelli spoke to ICU Management & Practice about the major challenges in the management of the critically ill patient.

**Sepsis remains a major health problem in the ICU and is associated with high mortality rates. What do you see as the main challenges when managing sepsis and septic shock?**

The first real problem in regards not only to septic shock and sepsis, but also to ARDS, is that we, as intensivists, treat the syndromes and not really the diseases. Sepsis is induced by an infectious disease condition, and septic shock is the most

severe expression of the sepsis. The kind of germs that can induce the infection may be quite diverse. Some of them can be multidrug-resistant. In addition to that, it depends if we are speaking about treating the sepsis that has been developed in the community or within the hospital.

The main challenge with the recognition of sepsis is also the timing. We never know when the real first moment



of sepsis started, and consequently, the recommendation is to try as much as we can to have an early recognition of symptoms to start early therapies. There is a lot of discussion concerning if it is better to concentrate on the main therapeutic interventions, within one hour or three hours etc. But whatever the personal attitude, nonetheless, the main issue is timing. The earlier it is, the better it is.

**The Surviving Sepsis Campaign is geared towards reducing mortality from sepsis. What are the main priorities of this campaign?**

The main priority of the Surviving Sepsis Campaign is to have a worldwide common protocol, and a common approach to sepsis. Together with the American Society of Critical Care Medicine (SCCM), the founder of the Surviving Sepsis Campaign (SSC) with the European Society of Intensive care Medicine (ESICM), we recently involved the WHO in the campaign. The WHO launched an international action involving countries of all the continents in

order to increase the awareness concerning the sepsis concept and its risks. The priority is not only speaking to the doctors and the personnel working in the hospital in order to identify the syndrome in the earlier phases and starting an appropriate therapy soon, but also giving recommendations to the general population in various contexts with the intent of preventing sepsis and the evolution of the infection towards the most dangerous complications.

I would also say that the main priority here is sharing a common mentality and trust for all the physicians working in any place of the world. But at the same time, educating the community and not only the Academy, on which could be the best priorities in sepsis, what sepsis means and how we can treat and recognise it. This is also one of the essential priorities of the Surviving Sepsis Campaign together with research for future development.

**The Berlin Definition of ARDS still remains controversial. Why do you think that is? And how do you think early recognition of ARDS can be improved? Which interventions are crucial for improving the outcomes of ARDS?**

Both ARDS and septic shock are syndromes. And in the case of ARDS, it can be multifactorial and have different causes. I give you some examples. A patient with severe trauma may develop ARDS. A patient with sepsis which is outside the lung - as an intrabdominal sepsis - may develop ARDS. A patient who has an intoxication may have ARDS. During a burn, the smoke that the patient inhales may induce ARDS. It means that the causes can be vastly different and our possibilities to treat the patient in the best way is to put together the various interventions and grade them depending upon the severity and chronology. What we did, when we coined the Berlin Definition of ARDS, was to make an effort

to allocate the possible interventions in the moments of ARDS. We identified the three different classes - mild, moderate and severe. For each of these classes, there was the recommendation of using early interventions focused in specific moments. In other words, if we have a severe ARDS that starts with the most dangerous situation, it would be better to apply protective ventilation, pronation and/or ECMO, while in the very early phases of ARDS, you may attempt to ventilate the patient non-invasively, keeping the spontaneous breathing alive. The other point is that with the ARDS definition, it was impossible to identify a marker that could provide an early diagnosis and prognostication. Due to this reason our approach to ARDS remains difficult. How can we improve the outcomes? The research will continue, but for the moment, a correct protective mechanical ventilation is crucial.

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**Weaning from mechanical ventilation is a challenge in ICUs. Delays in weaning can cause complications. Do you think there are any protocols that could be implemented to ensure patients can be weaned off as quickly as possible?**

Indeed, it is something that already exists. There are various attitudes and behaviours depending upon which side of the Atlantic Ocean you are. In the United States, for instance, they extensively use the protocols for weaning the patients, and they are carefully and strictly respected by the nurses. But the

structure of the ICU in the United States is substantially different because the doctors are not obliged to stay within the unit all day long, and also during the night. In Europe, we also have very similar protocols in order to speed up the weaning from mechanical ventilation as much as we can, but we have the advantage of having doctors 24 hours a day, seven days a week within the unit. This allows you to check your patients not only at specific moments, but many times a day. And this helps in reducing the amount of sedation when needed, and this can also be a helpful tool for decreasing the period of mechanical ventilation.

We have a number of studies that have been published on the various ways to wean patients from mechanical ventilation. I would say that in some studies, one methodology prevails, but in others the results might be exactly the opposite. This means that the best protocol does not exist. The point is that the weanability of a patient should be systematically and repeatedly checked. You can wean with pressure support or the T-piece trial or by using a trial of non-invasive ventilation after the extubation. All these possibilities can be effective. In large part, these choices depend on the physician's preferences. We have the protocols, we know the principles, but then we have to think intelligently as to how to apply those principles and protocols to that given patient.

**Another major issue facing healthcare is the growing prevalence of antibiotic resistance. In your opinion, what are the key reasons for this antibiotic crisis?**

This is a very complex situation. I think that the extensive use of antibiotics in agriculture was the main cause of this diffusion. Together with that, there is also the large use of antibiotics on the part of the general practitioner that has increased over the last 20 years, certainly after the Second World War. The overuse

of these antibiotics for conditions that do not necessarily need a prescription of antibiotics selected those germs that are more dangerous. Together with that, other factors such as genetic predisposition, geographical reasons, level of staffing and infection management may favour the dissemination of germs. Data from the European Infectious Disease Control Agency show that most of the multidrug-resistant germs are concentrated in Southern Europe, in South America, and in the Far East.

It might be easier to control and reduce the risk of transmitting infection when you have a one-to-one nurse-patient ratio. Because of budget constraints and other problems in staffing, sometimes the ratio can increase to one nurse for two or three patients. In such situations, it may become more difficult to respect the best rules for preventing infection cross-transmission.

**How do you think the misuse or overuse of antibiotics can be controlled keeping in mind the fact that any delay in the use of antibiotic treatment in critically ill patients can increase the risk of mortality?** This is very important. I think that in my hospital, as in many other hospitals nowadays, we apply stringent policies for antibiotic stewardship, which means not only paying attention to a careful prescription of an antibiotic, but also being ready to deescalate. For instance, when starting with a broad spectrum empirical antibiotic therapy for a serious infection, and getting the results from the microbiological laboratory, you may realise that the germs that you had supposed to be the cause is more susceptible to antibiotics with narrower spectrum. In this case, the broad-spectrum antibiotic should be deescalated to a narrow-spectrum antibiotic. At the same time, when we talk about the antibiotic stewardship, it also means speaking about antibiotic policy such as which procedure to use before surgery, the adequate selection of antibiotic, and

limiting prescription of the most recent generation antibiotic to those patients where these molecules cannot be replaced by more common ones. Thus, when we speak about stewardship, it is not only a matter of one single possible intervention, but a general broad policy to approach the entire problem in the hospital.

**Two other major issues are sedation and pain management in critically ill patients. What strategies can be used to maintain the minimum possible level of sedation in critically ill patients? Do you think any one particular sedative drug is better than others?**

I think that the patient should be sedated as little as possible in the ICU, but obviously, we shouldn't make any confusion between sedation and analgesia. Patients shouldn't have any pain for their conditions, but that does not mean they always need to be sedated. This can be true during the most serious moment of their disease, but after that, as soon as the doctors check the possibility of weaning from mechanical ventilation, the sedation reduction or suspension become mandatory. Never oversedate, and when using drugs, it is always better to titrate and individualise on the specific needs of the patient. Together with that, pain management is the essence. In Italy, we have a specific law that imposes checking for the presence of pain several times a day in all the patients and reporting interventions and outcome. I think that the nurses and doctors should give great attention to this specific aspect.

**What about delirium? Do you think that's only connected to sedation or do you think there are other factors at play and how do you think the risk can be reduced?**

Delirium is multifactorial. The ICU environment may "per se" induce delirium. In the ICU, throughout night and day, there is always noise because the noise

is invariably present due to the alarms and continuous activities. We should try to respect the night time and hours. We should dim the lights, and reduce the noise as much as we can. However, we should pay attention on ensuring prevention of delirium by regularly checking for it. One of the mistakes commonly committed is to pretend that certain drugs that are used for sedation could prevent delirium. This can be wrong. One example is dexmedetomidine, which is a fantastic sedative for collaborative sedation, but we cannot pretend that once the delirium occurs, this drug can be curative as it is not conceived as an anti-delirium agent.

**You've also indicated that you have an interest in humanising patient care in the ICU. What measures do you think can help achieve this?**

First of all, it depends on staffing and many other organisational factors. Allowing the relatives to stay within the unit and within the rooms of the loved ones as much as possible is very beneficial in helping the humanisation of care.

I always tell my residents and students that when you have a patient in front of you, you should think that this is not just a patient but also a person and then ask yourself how you would like to be treated if you were in the shoes of that person. Always try to have the best human touch, respect the dignity and speak to them and involve the patients and/or the relatives in the therapy plan, not forgetting their religious beliefs. ■