



EDITORIAL

Knowledge, collaboration, and leadership in the battle against infection and the appearance of resistances

Conocimiento, colaboración y liderazgo en la batalla contra la infección y aparición de resistencias

The current issue of *Medicina Intensiva* publishes the analysis of results of a nationwide multimodal initiative known as the Zero Resistance (ZR) program¹ intended to reduce the acquisition of multidrug-resistant (MDR) bacteria in patients admitted to intensive care units (ICU). The problem with infections following MDR bacteria is a significant and pressing problem of gram-negative infections with new patterns of resistance and treatment difficulties.^{2–4}

The objective of the project was to analyze the impact of a set of 10 recommendations given between 2014 and 2016 on ICU-acquired MDR bacteria. These were a set of recommendations on preventive isolation based on risk factors. We should mention the significant effort made in training during the project and its association with a safety program at the ICU setting (implicit in the different infection control and management projects derived from the ENVIN registry).

The project included a total of 103 ICUs, 130 000 patients, and over 800 000 stay days at the ICU setting. Besides these spectacular numbers, I believe that the following results are relevant:

1. Gradual increase in the number of patients in whom MDR bacteria colonization/infection is detected at ICU admission (a 32% increase). This piece of information *per se* is extremely relevant, changes completely the concept of acquisition of MDR bacteria at the ICU setting, and focuses on the previous colonization of patients from different hospital settings or admitted directly from the community. *Per se*, this finding confirms the significance of monitoring colonizations at ICU admission with a higher rate of positivity in relation to running tests, which is something that we may have not done before.
2. Lower rate of MDR bacteria acquired at the ICU setting (around 25%). Although this result is not significant in the study statistical analysis, there is no doubt that it is an important and clinically relevant finding. Also, at the ICU

setting, the acquisition MDR bacteria is associated with colonizations rather than infections. By the way, fewer infections (46%) were reported during the project.

The project has some limitations the authors have made public in the manuscript. Distinguishing infection from colonization is always controversial and requires unequivocal definitions to make sure we are talking about the same thing in all the cases. In the study it was difficult to measure reliably the compliance of the different ICUs to the measures proposed.

However, we should mention how important this type of collaborative projects among different health professionals really is. Undoubtedly, the ENVIN registry, in general, and the ZR program, in particular, lay the foundations for new collective efforts like the ones made to assess cancer patients admitted to the ICU (Onco-ENVIN)⁵ or recommendations made during the COVID-19 pandemic⁶ based on previous experiences. During the COVID-19 pandemic the issue of MDR bacterial infections has experienced setbacks that should make us rethink strategies⁷ and analyze the impact of different measures like preventive isolations.⁸

Undoubtedly, this project is part of a monitorization and prevention strategy regarding the appearance of infections at the ICU setting, which is a great advancement and a total heads-up to improve preventive activities in critically ill patients. This type of collective efforts is hard to make and even harder to keep across time. Only through individual and collective coordination efforts from all the investigators involved, and institutional support from scientific societies like different health agencies (both the ministry of health and autonomous communities) this type of collective efforts can become a reality. Both the fields of medicine and critical care nursing are associated with two different activities not fully recognized (early detection and prevention).

I would not want to end this editorial without mentioning Dr. Alvarez Lerma. Without his leadership—and knowing that this is a collective effort—it may have been impossible to conduct nationwide initiatives like this one.

Knowledge, leadership, and collaboration are key in today's medicine, not only for infection control and management.

References

1. Álvarez-Lerma F, Catalán-González M, Álvarez J, Sánchez-García M, Palomar-Martínez M, Fernández-Moreno I, et al. Impact of the Zero Resistance program on acquisition of multidrug-resistant bacteria in patients admitted to Intensive Care Units in Spain. A prospective, intervention, multimodal, multicenter study. *Med Intensiva (Engl Ed)*. 2023. S2173-5727(22)00349-6, <https://doi.org/10.1016/j.medine.2022.12.002>. Epub ahead of print. PMID: 36670011.
2. Díaz Santos E, Mora Jiménez C, Del Río-Carbajo L, Vidal-Cortés P. Treatment of severe multi-drug resistant *Pseudomonas aeruginosa* infections. *Med Intensiva (Engl Ed)*. 2022;46(9):508–20, <http://dx.doi.org/10.1016/j.medine.2022.06.014>.
3. Ferrer R, Soriano A, Cantón R, Del Pozo JL, García-Vidal C, Garnacho-Montero J, et al. A systematic literature review and expert consensus on risk factors associated to infection progression in adult patients with respiratory tract or rectal colonisation by carbapenem-resistant Gram-negative bacteria. *Rev Esp Quimioter*. 2022;35(5):455–67, <http://dx.doi.org/10.37201/req/062.2022>.
4. Garnacho-Montero J, Amaya-Villar R. The problem of multi-resistance in gram-negative bacilli in intensive care units: treatment and prevention strategies. *Med Intensiva (Engl Ed)*. 2022;46(6):326–35, <http://dx.doi.org/10.1016/j.medine.2022.04.006>.
5. Cantón-Bulnes ML, Jiménez-Sánchez M, Alcántara-Carmona S, Gimeno-Costa R, Berezo-García JA, Beato C, et al. Determinants of mortality in cancer patients with unscheduled admission to the Intensive Care Unit: a prospective multicenter study. *Med Intensiva (Engl Ed)*. 2022;46:669–79, <http://dx.doi.org/10.1016/j.medine.2021.08.019>.
6. Estella Á, Vidal-Cortés P, Rodríguez A, Andaluz Ojeda D, Martín-Loeches I, Díaz E, et al. Management of infectious complications associated with coronavirus infection in severe patients admitted to ICU. *Med Intensiva (Engl Ed)*. 2021;45(8):485–500, <http://dx.doi.org/10.1016/j.medine.2021.08.013>.
7. Marin-Corral J, Pascual-Guardia S, Muñoz-Bermúdez R, Salazar-Degracia A, Climent C, Vilà-Vilardell C, et al. Health care-associated infections in patients with COVID-19 pneumonia in COVID critical care areas. *Med Intensiva (Engl Ed)*. 2022;46(4):221–3, <http://dx.doi.org/10.1016/j.medine.2021.04.013>.
8. Abella Álvarez A, Janeiro Lumbreras D, Lobo Valbuena B, Naharro Abellán A, Torrejón Pérez I, Enciso Calderón V, et al. Analysis of the predictive value of preventive isolation criteria in the intensive care unit. *Med Intensiva (Engl Ed)*. 2021;45(4):205–10, <http://dx.doi.org/10.1016/j.medin.2019.09.022>.

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