

SPECIAL SUPPLEMENTS

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Nestlé Nutrition Institute Symposium Report

The Expanding Boundaries of ICU Nutrition

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Knowledge Transfer to Improve Outcomes in Critically Ill Immunocompromised Patients

An overview on sharing information, improving clinician skills, and transferring knowledge to ICU specialists about the care of immunocompromised patients.

Background

Studies have reported a volume-outcome relationship for cancer patients admitted to the ICU. In acute respiratory failure, mortality in ICUs managing more than 2 patients per week was 35%, whereas mortality is 70% in ICUs managing less than 1 patient per week (Lecuyer et al. 2008). The difference cannot be ascribable to benefits from being in a cancer hospital. In a large study from Brazil, the orchestra investigators reported that major differences were related to training programmes in critical care, daily visit of the oncologist in the ICU, presence of a clinical pharmacist and availability of protocols (Soares et al. 2016). Hence, educating ICU clinicians to improve their clinical skills remains a major endeavour.

Research Groups to Gather Data and Transfer Knowledge About the Care of Cancer Patients

The *Groupe de Recherche en Réanimation Respiratoire chez les patients d'OncoHématologie* (GRRR-OH) is a group of 32 centres in France and Belgium. Since 2003, this group has performed several cohort studies and clinical trials, mostly about acute respiratory failure in immunocompromised patients. In 2015, worldwide experts from 16 countries (Europe, USA, Canada, Brazil, Uruguay) established another research network named the Nine-I focusing more

broadly on all immunocompromised patients, with special emphasis on cancer patients. Major research domains include i) diagnostic and therapeutic strategy in cancer patients (bronchoscopy vs. noninvasive diagnostic tests in acute respiratory failure, oxygenation and ventilation managements, steroids in pneumocystis pneumonia, aminoglycosides in patients with febrile neutropaenia and sepsis, acute kidney injury, empirical antifungals, management of CART-cells and immunotherapy-related toxicity), ii) addressing the issue of undetermined ARF aetiology, iii) transfusion policies in sepsis, iv) de-escalation of anti-infectious agents and antibiotic stewardship, as well as v) clinical management of patients with nonmalignant haematological diseases (thrombotic microangiopathies, systemic vasculitis, and connective tissue diseases, emergency plasma exchange) (Mariotte et al. 2016). Main publications include studies in high impact factor journals in all the above-mentioned domains.

Current Opportunities to Transfer Knowledge About Immunocompromised Patients

The GRRR-OH organises 3 meetings per year and a 12-day course in French at the Paris University. These meetings combine formal lectures with open debates and controversies about the management of critically ill

immunocompromised patients. Research ideas are also presented and discussed. Centres are invited to take part in these studies. The 12-day meeting (*Diplôme d'Université*) includes one day per type of immune deficiency, including HIV-infected patients that are otherwise not included in our studies.

The Nine-I sets up a 1.5 day meeting in Paris at the end of March. Working groups prepare expert statements and position papers on different aspects of the care of immunocompromised patients. Then, formal lectures, controversies, and research ideas are discussed with all the group. In 2020, this meeting will be open to a wider public (March 30 and 31, 2020). From this group, an initiative focusing on CART cells related toxicity has been organised. Dr. Metaxa has hosted about 100 delegates in London in June 2019. Along this line, there will be another similar gathering of clinical data on patients admitted to the ICU following CART cell infusion (CARTTAS study - recruitment currently ongoing).

The Blood Diseases In The ICU (BDI) Training Course

Last year, we performed the first BDI course in St-Louis hospital, Paris. Thirty-six delegates attended this 5-day training course that covered most of the malignant and non-malignant haematological diseases. Interna-

tional speakers came from Europe, USA and Brazil to give lectures to the participants. A limited number of delegates were welcomed to maintain a friendly ambiance, quality interactions, and opportunities to share experience, raise concerns, and ask questions. A social programme was also part of the course. The course will again be organised in 2020, from January 6-10. Registrations will be possible by email or through www.blood-diseases-icu.com.

The GRRR-OH Basic Functioning

Our study group has several elements of functioning that could be summarised in the five following domains:

1. **Strong Clinical Skills:** Every GRRR-OH member is recognised as a clinical leader for the care of critically ill immunocompromised patients, and may have expertise in a specific field of critical care. Acute respiratory failure remains the leading domain of interest. However, as the GRRR-OH grew up and evolved, themes such as acute kidney injury, sepsis, antibiotic stewardship, invasive fungal infections, and transfusion have broadened the research domains.
2. **Multidisciplinary Management:** Our ICUs follow the model of closed ICUs, led by independent and autonomous medical teams. We have accumulated experience in severe forms of critical care illness that complicates haematological malignancies and solid tumours (e.g. leukostasis, leukaemic infiltration, tumour lysis syndrome, urgent need for chemotherapy, as well as complications of CAR-T cell therapy and immunotherapy for solid tumours). We work closely with haematologists and oncologists. By managing numerous critically ill onco-haematological patients in the ICU, we have learned how to address patient needs and provide them specialised care. A daily discussion with haematologists and oncologists is the rule for every patient. Patients and relatives are informed by the two
3. **A Fine-Tuned Organisation at the St-Louis Hospital, but Multiple Leaderships:** The GRRR-OH benefits from an organisation completely driven from St-Louis Hospital in Paris. All the administrative and organisational aspects are set up there. However, clinical and scientific leaderships are fairly distributed and shared across the GRRR-OH leaders. There is no doubt that our force is the sum of our expertise. For instance, each of us applies independently to various grants to fund studies, on behalf of the entire group. The GRRR-OH has a scientific advisory board, with each an expert in his own field of expertise.
4. **Transfer of Knowledge:** The GRRR-OH is a research group that has a large interest in transferring and acquiring knowledge. Besides the training courses listed above, every day advice is sought among the GRRR-OH experts. This is mostly related to the need to be guided through diagnosis, to validate therapeutic management, to discuss the goals of care, or to know more about a disease.
5. **International Collaboration:** The GRRR-OH has a strong collaboration with colleagues outside France. The GRRR-OH is originally French and Belgian. Also, since 2015, the multinational network named Nine-I has broadened the vision and expertise of the GRRR-OH. Experts from 16 countries (68 ICUs) have played an active role and have opened discussions, raised controversies, and brought new area of expertise to our group. In the future, we will be seeking to develop collaborations with everyone at stake and interested with the management of immunocompromised patients. We

look forward to collaborating with our colleagues and friends from the Middle-East, Asia, Australia, and New-Zealand, and from everywhere in the world.

Conclusion

In immunocompromised patients admitted to the ICU, there are significant discrepancies in survival rates across centres. Research should help understand what the main determinants of this centre effect are, and how these differences could be addressed at the bedside. Moreover, teaching opportunities are an efficient way to transfer knowledge from experienced to less-experienced centres. The GRRR-OH and the Nine-I are research groups that provide several opportunities to share information, improve clinician skills, and transfer knowledge to ICU specialists about the care of immunocompromised patients. ■

Key points

- Educating ICU clinicians to improve their clinical skills when managing immunocompromised patients remains a major endeavour.
- The Groupe de Recherche en Réanimation Respiratoire chez les patients d'OncHématologie (GRRR-OH) is a group of 32 centres in France and Belgium performing studies about acute respiratory failure in immunocompromised patients.
- Nine-I is a research network that focuses more broadly on all immunocompromised patients, with special emphasis on cancer patients.
- The Blood Diseases in the ICU is a training course that covers malignant and non-malignant haematological diseases.

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