Editorial

Hyperbaric oxygen treatment for the critically ill patient

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There are pros and cons with both the monoplace and multiplace chambers as used in intubated, critically ill patients.[1] In the multiplace chamber, staffing is a potential limitation because very few centres have sufficient numbers of intensive care unit (ICU) personnel and clinicians available 24/7, especially when offering HBO_2 twice per day or more than one critically ill patient per day.[2] The staffing demands for the treatment of critically ill patients in a monoplace chamber are less burdensome since inside attendants are not required. In addition, the staff in multiplace chambers incur a decompression risk, especially when exposed to the high pressures often used to treat critically ill patients, often up to 304 kPa. When multiplace chambers are operated at increased altitude, such as that in Salt Lake City, the decompression risk for inside attendants can be unacceptably high, but may be lessened by the attendant breathing supplemental oxygen, which may also have adverse consequences if done repetitively over many years.

Clearly a relatively smooth transition from the ICU to the hyperbaric centre can be accomplished by using multiplace chambers if the same IV pumps and ventilators (including modern-day ventilator modes) are used in the chamber as in the ICU.[3] For monoplace chamber treatment of critically ill patients, their IVs must be changed to accommodate the IV pass-through and IV pump, which may be different to that of the ICU (and with different tubing), and ventilator support is much more challenging than what is possible in the multiplace chamber. Unfortunately, monoplace chamber ventilators are very limited in performance and features. These limitations often require the patient to be deeply sedated for HBO_2 and sometimes pharmacologically paralyzed, which can be independently risky. Nevertheless, with a skilled staff and specialized equipment, monoplace chamber use for very ill patients can be accomplished without evidence that adverse events are any greater than if treated in multiplace chambers.

The bottom line is, if the critical care centre is fully committed to HBO_2 for critically ill patients, sufficient staff must be trained in HBO_2 and critical care, the chamber must be in close proximity to the ICU, equipment must work seamlessly with that in the ICU and there must be sufficient clinical workload to maintain staff skills. If these criteria are not satisfied, then monoplace chamber use for critically ill patients is a reasonable alternative, but close proximity to the ICU (or preferably inside the ICU) and a skilled staff fully aware of pitfalls and issues unique to HBO_2 are very important. Certainly the financial cost of implementing monoplace chambers for critically ill patients is a factor worthy of consideration too, since they are less expensive than fully equipped multiplace chambers. The ECHM position paper summarises all these various issues.[4]

References

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