High Flow Nasal Oxygen Use in Palliative Care

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Introduction

High flow nasal oxygen (HFNO) devices are available for use in the adult patient with respiratory failure to avoid intubation. This technology has only recently been used as a therapy for adult patients with critical illness. HFNO (up to 50L/min) via nasal cannula combined with a heated humidification system can decrease oxygen dilution, reduce dead space, and provide low level positive end-expiratory pressure. The heated humidity makes the higher flow rates tolerable.

There is only limited research related to the best application of this technology in the palliative care population (1,2). One small study compared high flow face mask to HFNO and found fewer patients in the HFNO group required non-invasive ventilation during their intensive care unit stay(3). Other studies have confirmed that HFNO is better tolerated than face mask oxygen therapy and provides better oxygenation in acute respiratory failure (4).

This presentation will report on a selection of patients for whom palliative care consultation was requested and were receiving HFNO. The presenters will review how withdrawal of HFNO therapy compares to withdrawal of invasive ventilation support at the end of life and make suggestions related to institutional policy development for use of HFNO in the non-critical care setting.

Methods

HFNO use in the adult critical care setting began at Fletcher Allen Health Care in December, 2010. Patients receiving HFNO at Fletcher Allen Health Care and a Palliative Care Service consult were included in this case series. Fifteen patients were identified from February 2011 to January 2012. Primary diagnosis related to respiratory failure, age, date of consultation, and outcomes were recorded.

An institutional policy for use of HFNO was developed in January, 2011. This policy included indications for use, contraindications, monitoring requirements, use of HFNO on the general medicine units, and documentation requirements. Variances from accepted policy recommendations were identified in the palliative care patients treated with HFNO.
Results

Fifteen patients with an age range of 58 to 96 were identified, having received HFNO and a palliative care consult. All patients had designated do not intubate (DNI) if they declined despite HFNO. All except two had irreversible respiratory failure that led to the end of their life and required terminal removal of HFNO. The patient experience of HFNO was that it was well tolerated and led to improved oxygenation for a period of time. Terminal removal of HFNO (death within 24 hours) occurred in thirteen out of fifteen patients. This occurred in the intensive care unit (9 patients), the general medical ward (6 patients) and the cardiology ward (1 patient). Patients either chose to remove HFNO and allow their life to end or began active dying despite this therapy and family made decision to have the devise removed. Most patients who underwent terminal removal of HFNO were awake and aware of their conditions and imminent death (10/13). The symptom management of terminal removal of HFNO was very similar to removal of invasive ventilation support in the intubated patient. All patients required anticipatory management of dyspnea with opioids prior to removing HFNO.

All fifteen patients met the criteria for use of HFNO based on the indications and contraindications stated in the Fletcher Allen policy statement. In addition, all patients who were transferred to the general medical ward from the medical intensive care unit met the policy criteria of established DNR/DNI (no intent to escalate therapy), comfort care, or palliative care consult patient. However the designation not to escalate care did not correspond to having a clear end of life care plan and the palliative care service played an active role in helping patients and families know what to expect, delineate goals and assure comfort when this technology was discontinued. All patients receiving HFNO continued to have monitoring (vital signs, respiratory status, therapy effectiveness, pulse oximetry, and patient tolerance every four hours). This would not be a usual monitoring process for patients receiving comfort-directed end of life care.

Discussion

HFNO devices add a new bridge therapy for patients with respiratory failure who cannot tolerate mask therapy or BiPAP. HFNO can be tried in almost any patient with high inspiratory flow demand, post-extubation, or those with tracheostomy who require heated humidity. HFNO is not appropriate for patients with hypercapneic respiratory failure/inadequate ventilation. The patient must have a patent airway and spontaneous respiratory effort.

In the palliative care patient on HFNO several additional issues must be considered. Patients who require this therapy have severe respiratory failure and are unlikely to have reversible conditions. They become dependent on the high oxygen delivery capability and the positive end expiratory pressure for ventilator support. Therefore they
are likely to have rapid deterioration when either their condition worsens despite this therapy or when the HFNO is removed. In our patients, once an oxygen flow rate was determined, weaning from dependency on this set rate was not possible without significant return of symptoms of respiratory failure. Therefore removal of HFNO is similar to removal of invasive ventilation and aggressive control of symptoms of dyspnea is essential. When a patient with respiratory failure becomes dependent on HFNO they are destined to spend the remainder of their life in the acute hospital care setting. It is unlikely that palliative care or hospice programs will ever be able to provide this expensive and complex therapy in a facility other than the hospital.

When developing an institutional policy for use of HFNO the palliative care service should participate. Policy decisions about use of HFNO on the general medical ward can conflict with usual and customary care of patients who have transitioned to comfort directed goals of care. This is evidenced in the aggressive monitoring of vital signs and pulse oximetry that occurred in our patient group, even for those who were only seeking comfort care.

Recommendations

1) Palliative care programs should be involved in policy decisions about the use of HFNO.

2) Palliative care should be consulted to assist in establishing goals of care for patients who are placed on HFNO with irreversible conditions leading to respiratory failure.

3) Palliative care programs should review and report their experience with HFNO in patients not wanting further escalation so that criteria can be developed for optimal use of this technology.

4) All care givers of patients on HFNO who are contemplating stopping this therapy should be prepared for aggressive symptom management, similar to terminal extubation.

5) Patients should be made aware that HFNO can only be administered in the hospital setting.
References

1) Kernick J, Magerey J, et al. What is the evidence for the use of high flow nasal cannula oxygen in adult patients admitted to critical care units? A systematic review. Aus Crit Care 2010;23: 53

