

The use of Non-Invasive Ventilation in a regional adult Cystic Fibrosis centre

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INTRODUCTION

Non-Invasive Ventilation (NIV) has been used as an effective treatment for acute hypercapnic respiratory failure (ARF) in patients with COPD, neuromuscular disorders and chest wall deformities (1). However, many Cystic Fibrosis (CF) adults experience similar difficulties as these patients as their disease progresses, including; sputum retention and Type II Respiratory Failure. Therefore, NIV may also be a potentially useful intervention for these patients to aid sputum clearance, control symptoms of chronic hypercapnia and to reverse acute on chronic respiratory failure.

BACKGROUND

Moran et al (2008) in a Cochrane review (2) of the use of NIV in CF found NIV improves gaseous exchange during sleep and aids sputum clearance. A randomised controlled trial (Young 2008) included in this review, compared the use of overnight NIV with oxygen and air. This study demonstrated that NIV improved chest symptom scores on CF specific quality of life scores, exercise performance (Modified Shuttle Walk Test) and reduced maximal nocturnal CO₂ levels.

Recent NIV guidelines set by the British Thoracic Society (BTS) in 2002 (1) and The Royal College of Physicians in 2008 (3) state NIV can also be used as a bridge to transplantation in CF patients and may also help relieve symptoms of breathlessness in palliation.

AIMS OF THE STUDY

- To establish the reasons for NIV initiation in CF adults within a regional CF centre
- To ascertain patient tolerance of this treatment modality and their perceived benefits of the intervention
- To identify any complications of NIV use in this patient group

METHOD

- A 12 month retrospective observational study was undertaken of all CF adults treated with NIV within a regional Adult CF Centre
- Inclusion and exclusion criteria were applied to all CF adults treated with NIV
- Data was collected on patient demographics, reason for NIV initiation, patient tolerance/ perceived benefits and any complications experienced during the treatment period

INCLUSION CRITERIA

- All patients treated with NIV for hypercapnic respiratory failure or as an adjunct to physiotherapy treatment to aid sputum clearance

EXCLUSION CRITERIA

- Patients already established on domiciliary NIV admitted during this period whose NIV settings were not changed

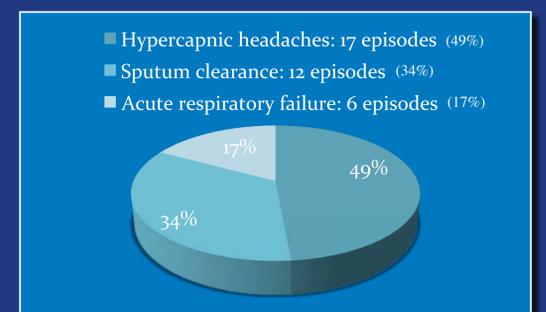
DATA COLLECTION

1. Primary reason for NIV initiation:
 - To aid sputum clearance
 - To relieve symptoms of chronically compensated Type II Respiratory Failure
 - To reverse acute/acute on chronic uncompensated Type II RF (ARF)
2. Patient's tolerance of NIV:
 - Continuation/ completion of NIV episode
 - NIV suspended at patient's request during initial treatment session
3. Patient's main perceived benefit of NIV:
 - Improved sputum clearance
 - Reduced symptoms of hypercapnic headaches
 - Decreased work of breathing (WOB)
4. Any complications experienced by the patient whilst using NIV:
 - Details and subsequent management

DEMOGRAPHICS

- Total patients treated: 20
- Total treatment episodes: 35
- Mean episodes per patient: 1.7
- Females: 11 (55%)
- Mean age (SD) years: 31 (±8)
- Mean (SD) % pred FEV₁: 24 (±10)

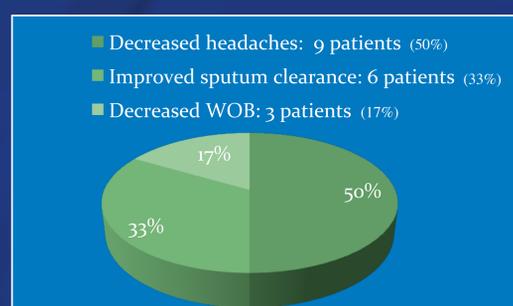
RESULTS: REASON FOR NIV INITIATION



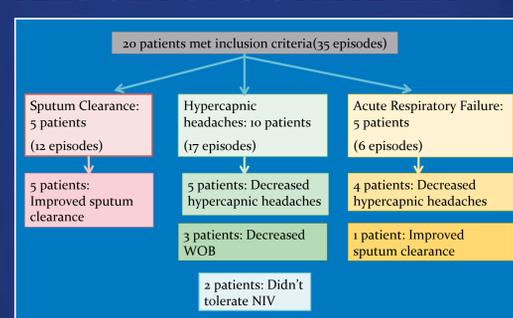
RESULTS: PATIENT TOLERANCE

- 90% (18/20) patients tolerated the NIV
- Reasons for NIV intolerance:
 - Felt no benefit: 1 patient (5%)
 - Unable to tolerate mask and feeling of positive pressure: 1 patient (5%)

RESULTS: PERCEIVED BENEFITS



RESULTS: SUMMARY



RESULTS: COMPLICATIONS

- 10 patients experienced complications (50%):
 - Aerophagia: 4 patients
 - Pressure sores: 3 patients
 - Difficulty sleeping: 2 patients
 - Dehydration: 2 patients
- (NB: 1 patient reported both aerophagia and a nasal pressure sore)

CONCLUSION

- NIV was initiated to treat ARF, control symptoms of hypercapnic headaches and aid sputum clearance in CF adults in our regional centre
- NIV was generally well tolerated and patients perceived benefit in terms of sputum clearance and hypercapnic symptomatic relief
- Highlighted awareness of common complications of NIV, enabling future management strategies to be developed

DISCUSSION

- Consideration is needed when selecting the most appropriate NIV interfaces specific to patient needs/ preference and to avoid complications e.g. nasal pillows to prevent nasal bridge pressure sores and minimise air swallowing
- Liaison with MDT is needed to initiate treatments to prevent/ relieve discomfort of bloatedness
- Education of patient and family/friends regarding aims and benefits of treatment in conjunction with support and reassurance is vital and may help improve tolerance and concordance.

ACKNOWLEDGEMENTS

- Physiotherapy team and CF adults at the West Midlands Regional Adult Cystic Fibrosis Centre

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