

New, individually fitted nasal mask for home ventilators in neuromuscular diseases.

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Background

Treatment of respiratory muscle insufficiency in neuromuscular diseases has been improved during recent years with the development of portable, quiet-running home ventilators which are connected by mouthpiece or nasal mask (1-5)

Treatment is often made more difficult by problems in obtaining a sufficiently tight seal, between the mouthpiece/mask and the surface to which it is applied, without causing tissue damage. In those with severe physical disability there are difficulties in operating complicated attachment devices. Furthermore, some types of mask make it impossible to read or watch television since the mask interferes with the field of vision.

A new, individually fitted mask has been developed with the aim of using the natural, nasal airways, of avoiding tissue damage, of providing a simple method of attachment and of attaining a high degree of safety even with assisted ventilation during sleep.

Method

A special impression mould is used to take an alginate impression of the nose

A plaster model is made and the model is modified to obtain maximum tightness of seal.

The tube connection at the mask consists of a plastic tube with an internal diameter of 6.8 mm.

Since this plastic tube also forms part of the mask's attachment complex, the shape (nose/ear angle) is important.

If the wrong angle is formed, the mask will not have a tight seal.

The preshaped plastic tube is attached to the plaster model and the mask is cast in VCL material.

The patient tries the mask out with the ventilator connected and adjustments can be made if required.

The headgear holding the mask in position is not completely finished. The tube attachment of one side is not sewn in place until the trial has been made. This is to ensure that the line of traction lies at the correct angle and that maximum tightness of seal is obtained.

Alternative versions of mask have been tested

-With a dental splint as attachment element

-With a single-channel inlet at the front. This design requires a continuation with a tape around the neck or ears.

Results

48 patients aged 13-72 have tested the individual mask from 6month to 2 years.

4 have a mask with dental splint

3 have a connection at the front, of which one is CPAP type

4 have been remodelled due to anatomical changes

1 has reported transient smarting pain

3 have broken

Some have noted a disturbing noise

1 has not been able to use the mask since she can not put the headgear on correctly

No pressure injuries or peripheral circulation disturbances have been reported.

3 have died, non due to the neuromuscular diseases.

Use of mask with connected dental splint can cause a transient increase in salivation.

Other complications of treatment

1. The type with dental splint

Leakage problems. These are due to the difficulty of fitting the mask to the dental splint.

This must be done manually directly on the patient.

2. Patient who have been given the individual mask without first having had training a ventilator and standard mask.

This group of patients (n 10) all report leakage problems and difficulties in attaching the mask and headgear.

After a few weeks of training, the problems fade out.

All have preferred the individually fitted mask to the commercially available types.

Conclusion

The individually cast mask for nasal application of home ventilator user constitutes a valuable addition to the arsenal of appliances.

For best results, the patient have to be treated at a unit with specially trained personnel and the patient must first also have a period of training with home ventilator and standard mask

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