Online Table S4.2: Side effects of interfaces

Author	Country	Journal	Number of patients	Ages	Type of study	Results
Ramirez et al. [1]	France	Intensive Care Med	97 children started on CPAP/NIV:35 NMD or scoliosis, 32 craniofacial malformation, OSA without facial malformation, 9 lung disease	0 - 18 yrs	Descriptive study	All 25 children ≤ 2 yrs + 4 older children needed custom made nasal masks. In other patients, an industrial nasal mask, a facial mask, or nasal prongs were used in 50%, 16%, and 2% of pts. Industrial masks without and with manufacturer leaks were used in 35 (36%) and 33 (34%) pts, respectively. The interface had to be changed in 20 (21%) patients because of discomfort (n=16), leaks (n=4), facial growth (n=3), skin injury (n=2), or change of ventilatory mode (n=2). A second or third mask change was necessary in 9 and 4 patients, respectively (> maxillofacial pts)
Kushida et al. [2]	USA	J Clin Sleep Med	16	2.4 - 7.7 yrs	Comparison of the Pixi mask with other masks	Pixi mask rated as more comfortable by parents (less restful sleep, trouble getting asleep and staying asleep), fewer skin side effects (marks on upper lip and under the ear) and easier to remove than previous mask Compliance with Pixi 7.1 ± 2.5h/night vs 8.2 ± 2.1h/night with previous mask (not significant)), PSG results comparable
Acorda et al. [3]	USA	J Ped Nursing	?	?	Descriptive study In hospital BPAP (in fact CPAP) treatment	Decrease of number and severity of skin pressure related ulcers after protocolized management (no numbers)
Visscher et al. [4]	USA	Respir Care	50	0.1-32.5 yrs	Prospective study: 3-dimensional face	Stage I ulcers most common, nose bridge most common, high skin hydratation was associated with skin ulcers, areas of high contact were associate with

					imaging and measure of skin hydratation	skin erythema and pressure ulcers. A cloth mask was associated with the best skin tolerance.
Fauroux et al. [5]	France	Intensive Care Med	40	0.2-17 yrs	Descriptive study	47% skin injury, predictors: age > 10 yrs + commercial mask 37% maxillary retrusion, predictor: longer daily use
Roberts et al. [6]	USA	J Clin Sleep Med	50 CPAP compliant compared to 50 non-compliant	Children with craniofacial conditions, mean age 10.4 yrs	Retrospective study, serial cephalographic images	Greater mean retrusion of mid-face in compliant pts + counterclockwise rotation of the palatal plane + upper incisor flaring
Tibbals et al. [7]	Australia	Pediatr Pulmonol	4 children with CCHS	6-16 yrs	Descriptive study	All treated with NIV, 3 transitioned to negative pressure ventilation due to mid-face hypoplasia
Castro-Codesal et al. [8]	Canada	Paediatr Respir Rev			Review of the mask interfaces for home NIV in infants and children	Interface-related problems are common and, if not recognized, have the potential to cause serious damage, jeopardize the use of the therapy, or lead to poor adherence. Frequent mask-related complications include nasal symptoms, unintentional leak, mask displacement, skin injury, and midface hypoplasia. Close monitoring and a pro-active approach may help to minimize complications and promote the optimal use of home NIV.
De Jesus Rojas et al. [9]	USA	The Open Respir Med J	18 children 7 chest wall disease, 6 central control abnormalities, 3 obstructive lung disease,	4 m -19 yrs (average 7 yrs)	Retrospective case series	Complications associated with Nasal NIV/RAM Cannula were negligible in our study population. A minimal nasal rub on the nasal columella was reported as an adverse side effect in one patient.

			and 2 restrictive lung disease.			
Norregaard [10]	Denmark	Eur Respir J			Review	Adverse effects are generally minor, although in the chronic setting the effect of the interface on facial bony structures should be monitored closely.
Wallis [11]	UK	Paediatr Respir Rev	76 children (survey)	0.3-16 yrs	Review + results of a survey (home CPAP via nasal mask for obstructive sleep apnoea: The Great Ormond Street Experience 1994–1998)	The mask should not be fitted tightly onto the face, but secured by straps that maintain a gentle pressure equally around the mask. Mask ventilation is safe and major complications have not been reported frequently. Masks need individual adjustment and the level of pressure support requires regular evaluation to ensure adequate gas exchange. Minor problems occasionally arise.

Abbreviations: m: months, yrs: years, OSA: obstructive sleep apnea, CPAP: continuous positive airway pressure, BPAP: bilevel positive airway pressure, NIV: noninvasive ventilation, NMD: neuromuscular disease, CCHS : congenital central hypoventilation.

References

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