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Tratamento de doentes com SAOS: A interface ideal.

Com uma introdução de
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Tratamento de doentes com SAOS:

A interface ideal

Introdução

A utilização de equipamentos geradores de pressão positiva contínua na via aérea (CPAP) é considerada o tratamento de primeira linha para a Síndrome de Apneia Obstrutiva do Sono (SAOS). Apesar de existirem recomendações internacionais, definidas pela American Academy of Sleep Medicine, acerca das indicações para utilização de CPAP, não existem normas quanto à decisão da interface mais adequada. A seleção do tipo de máscara tem impacto na eficácia do tratamento da SAOS e na adesão terapêutica, pelo que a decisão da interface é um momento decisivo na abordagem destes doentes.

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O tratamento com equipamentos geradores de pressão positiva na via aérea (CPAP) é a opção de primeira linha em doentes com SAOS, de acordo com as indicações da American Academy of Sleep Medicine. O tratamento com CPAP demonstrou efeitos benéficos permitindo redução do risco cardiovascular e metabólico, melhoria da sonolência diurna, das funções cognitivas e da qualidade de vida. Apesar dos efeitos em diferentes outcomes, a taxa de abandono do tratamento pode atingir os 20-25%, tornando a promoção da adesão ao tratamento um dos pontos-chave para o sucesso terapêutico¹.

À luz do conhecimento atual, os fatores que influenciam a adesão a CPAP podem organizar-se do seguinte modo¹:

1. Fatores individuais – que incluem características como a idade, o género, status socioeconómico, fatores psicológicos ou doenças associadas;
2. Fatores relacionados com a doença – gravidade da SAOS de acordo com o índice de apneia-hipopneia (IAH) ou o grau de sonolência diurna;
3. Fatores relacionados com o tratamento – que incluem o equipamento e interface.

A seleção do tipo de interface é crucial para o sucesso terapêutico. Atualmente estão disponíveis no mercado diferentes tipos de inter-

faces, que incluem as máscaras nasais, faciais, híbridas e almofadas nasais. A máscara nasal demonstrou eficácia superior comparativamente à máscara facial, com maior resolução dos índices de apneia-hipopneia (IAH) residuais, traduzindo-se por maior adesão ao tratamento^{2,3}. As almofadas nasais constituem uma alternativa à máscara nasal e apresentam eficácia equivalente. No entanto, os estudos demonstraram maior ocorrência de efeitos locais, como congestão nasal e epistaxis, com este tipo de interface².

Na SAOS, os mecanismos subjacentes à obstrução da via aérea e ao seu colapso dependem da pressão nasal, da traqueia e da faringe. A pressão aplicada por via nasal através de um CPAP é superior à pressão crítica da faringe, promovendo a patência da via aérea. A aplicação de pressão através de uma máscara facial não está de acordo com os princípios do modelo de resistência de Starling utilizados por Sullivan quando descreveu o CPAP pela primeira vez. Do ponto de vista conceptual, a mesma pressão aplicada via oral pode levar ao colapso faríngeo, tal como descrito em alguns estudos⁴ que demonstraram uma resistência das vias aéreas superior durante a respiração oral comparativamente à nasal e que a pressão necessária para manter a via aérea permeável é mais elevada quando se aplica uma máscara facial¹.



Susana Sousa

Numa metanálise² recente foram revistos seis estudos que analisaram o impacto terapêutico das diferentes interfaces. Nos estudos que avaliaram a preferência do doente verificou-se vantagem da máscara nasal, preferida por 66% dos doentes, salientando-se que 1/3 dos doentes que escolheu inicialmente uma máscara facial alterou a interface para nasal no follow-up do estudo. Os estudos que avaliaram a eficácia do tratamento demonstraram índices residuais de IAH superiores no grupo de doentes com máscara facial comparativamente a nasal, para doentes com características antropométricas e gravidade de doença similar⁵. A pressão de CPAP aferida em laboratório foi cerca de 2 cmH₂O superior nos doentes tratados com máscara facial e a pressão eficaz determinada nos equipamentos automáticos durante período de tratamento também foi significativamente superior nesse grupo de doentes, revelando uma tendência para pior performance e relacionando-se com menor taxa de adesão terapêutica.

Alguns estudos avaliaram o impacto do tipo de máscara na adesão ao tratamento. Verificou-se uma taxa de adesão mais baixa quando recomendada uma máscara facial comparativamente a nasal e uma maior taxa de abandonos neste grupo. A terapêutica com máscara facial associou-se a pior qualidade do sono, maior registo de fugas, menor grau de satisfação e menor

sensação de conforto comparativamente a máscara nasal^{2,5,6}.

As almofadas nasais demonstraram dados de eficácia de tratamento semelhantes à utilização de máscara nasal, determinados pelo índice de IAH residual, sendo ambas significativamente superiores comparativamente à máscara facial³. No entanto, as almofadas nasais associaram-se a maior ocorrência de efeitos secundários, nomeadamente congestão nasal, secura da mucosa nasal, epistáxis e cefaleias versus máscara nasal.²

Salienta-se ainda que em doentes que apresentam respiração de predomínio oral («mouth breathers»), a abordagem inicial deve incluir o tratamento da obstrução nasal (tratamento médico ou cirúrgico). Não existe contraindicação para utilização de máscara nasal nestes doentes, existindo evidência de modificação dos hábitos de respiração com utilização progressiva da interface nasal.

Em conclusão, a máscara nasal deve constituir sempre a primeira escolha na abordagem dos doentes com SAOS por se associar a maior eficácia e maior taxa de adesão ao tratamento. As almofadas nasais constituem uma alternativa à máscara nasal, com eficácia sobreponível, embora se associem a maior número de efeitos secundários.

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Abstract. Type of Mask Impact on Continuous Positive Airway Pressure Adherence in Apneic Patients

Jean Christian Borel, Renaud Tamisier, Sonia Dias-Domingos, Marc Sapene, Francis Martin, Bruno Stach, Yves Grillet, Jean François Muir, Patrick Levy, Frederic Series, Jean-Louis Pepin

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Rationale: In obstructive sleep apnea patients (OSA), continuous positive airway pressure (CPAP) adherence is crucial to improve symptoms and cardiometabolic outcomes. The choice of mask may influence CPAP adherence but this issue has never been addressed properly.

Objective: To evaluate the impact of nasal pillows, nasal and oronasal masks on CPAP adherence in a cohort of OSA.

Methods: Newly CPAP treated OSA participating in "Observatoire Sommeil de la Fédération de Pneumologie", a French national prospective cohort, were included between March 2009 and December 2011. Anthropometric data, medical history, OSA severity, sleepiness, depressive status, treatment modalities (auto-CPAP versus fixed pressure, pressure level, interface type, use of humidifiers) and CPAP-related side effects were included in multivariate analysis to determine independent variables associated with CPAP adherence.

Results: 2311 OSA (age = 57(12) years, apnea+hypopnea index = 41(21)/h, 29% female) were included. Nasal masks, oronasal masks and nasal pillows were used by 62.4, 26.2 and 11.4% of the patients, respectively. In

univariate analysis, oronasal masks and nasal pillows were associated with higher risk of CPAP non-adherence. CPAP non-adherence was also associated with younger age, female gender, mild OSA, gastroesophageal reflux, depression status, low effective pressure and CPAP-related side effects. In multivariate analysis, CPAP non-adherence was associated with the use of oronasal masks (OR = 2.0; 95%CI = 1.6; 2.5), depression, low effective pressure, and side effects.

Conclusion: As oronasal masks negatively impact on CPAP adherence, a nasal mask should be preferred as the first option. Patients on oronasal masks should be carefully followed.

Abstract. Impact of the type of mask on the effectiveness of and adherence to continuous positive airway pressure treatment for Obstructive sleep apnea.

Rafaela Andrade, Vivien Piccin, Juliana Nascimento, Fernanda Viana, Pedro Genta, Geraldo Lorenzi-Filho

J Bras Pneumol.
2014; 40(6):658-668

Continuous positive airway pressure (CPAP) is the gold standard for the treatment of obstructive sleep apnea (OSA). Although CPAP was originally applied with a nasal mask, various interfaces are currently available. This study reviews theoretical concepts and questions the premise that all types of interfaces produce similar results.

We revised the evidence in the literature about the impact that the type of CPAP interface has on the effectiveness of and adherence to OSA treatment. We searched the PubMed database using the search terms "CPAP", "mask", and "obstructive sleep apnea".

Although we identified 91 studies, only 12 described the impact of the type of CPAP interface on treatment effectiveness ($n = 6$) or adherence ($n = 6$). Despite conflicting results, we found no consistent evidence that nasal pillows and oral masks alter OSA treatment effectiveness or adherence. In contrast, most studies showed that oronasal masks are less effective and are more often associated with lower adherence and higher CPAP abandonment than are nasal masks.

We concluded that oronasal masks can compromise CPAP OSA treatment adherence and effectiveness. Further studies are needed in order to

understand the exact mechanisms involved in this effect.

Abstract. The efficacy of three different mask styles on a PAP titration night

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Sleep Medicine.
13 (2012), 645-649

BACKGROUND:

This study compared the efficacy of three different masks, nasal pillows, nasal masks and full face (oronasal) masks, during a single night of titration with continuous positive airway pressure (CPAP).

METHODS:

Fifty five subjects that included men (n=33) and women (n=22) were randomly assigned to one of three masks and underwent a routine titration with incremental CPAP applied through the different masks.

RESULTS:

CPAP applied through the nasal pillows and nasal mask was equally effective in treating mild, moderate, and severe sleep apnea. However, CPAP applied through the oronasal mask required a significantly higher pressure compared to nasal masks to treat moderately severe ($2.8 \text{ cm of H}_2\text{O} \pm 2.1 \text{ SD}$) and severe ($6.0 \text{ cm of H}_2\text{O} \pm 3.2 \text{ SD}$) obstructive sleep apnea.

CONCLUSION:

CPAP applied with either nasal mask was effective in treating mild, moderate, and severe sleep apnea. The oronasal mask required significantly higher pressures in subjects with moderate to severe disease. Therefore, when changing from a nasal to an oronasal mask, a repeat titration is required to ensure effective treatment of sleep apnea, especially in patients with moderate to severe disease.

Abstract. Equivalence of nasal and oronasal mask during initial CPAP titration for obstructive sleep apnea syndrome

Ming Teo, Terence Amis, et al.

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Sleep
Vol 34, N 7, 2011

Study Objective:

Continuous positive airway pressure (CPAP) titration studies are commonly performed using a nasal mask but some patients may prefer a full-face or oronasal mask. There is little evidence regarding the equivalence of different mask interfaces used to initiate treatment. We hypothesized that oronasal breathing when using an oronasal mask increases upper airway collapsibility and that a higher pressure may be required to maintain airway patency. We also assessed patient preferences for the 2 mask interfaces.

Design:

Prospective, randomized, cross-over design with 2 consecutive CPAP titration nights.

Setting:

Accredited laboratory in a university hospital.

Patients or Participants:

Twenty-four treatment-naïve subjects with obstructive sleep apnea syndrome and respiratory disturbance index of greater than 15 events per hour.

Interventions:

CPAP titration was performed using an auto-titrating machine with randomization to a nasal or oronasal mask, followed by a second titration night using the alternate mask style.

Measurements and Results:

There was no significant difference in the mean pressures determined between nasal and oronasal masks, although 43% of subjects had nasal-to-oronasal mask-pressure differences of 2 cm H₂O or more. Residual respiratory events, arousals, and measured leak were all greater with the oronasal mask. Seventy-nine percent of subjects preferred the nasal mask.

Conclusions:

Patients with obstructive sleep apnea syndrome can generally switch between nasal and oronasal masks without changing machine pressure, although there are individual differences that may be clinically significant. Measured leak is greater with the oronasal mask. Most patients with obstructive sleep apnea syndrome prefer a nasal mask as the interface for initiation of CPAP.]

Abstract. A randomised controlled trial on the effect of mask choice on residual respiratory events with continuous airway pressure treatment

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Sleep Medicine
15 (2014), 619-624

INTRODUCTION:

It has been found that mask style can affect the amount of continuous positive airway pressure (CPAP) required to reduce an apnoea/hypnoea index (AHI) to $< 5/h$ on a titration study. However, it was not previously known whether switching from one CPAP mask style to another post titration could affect the residual AHI with CPAP. The purpose of this study was to investigate the differences in residual AHI with CPAP treatment between oronasal and nasal masks.

METHODS:

Twenty-one subjects (age mean (M)=62.9, body mass index (BMI) M=29.6 kg/m²) were randomised (14 subjects completed the protocol) to undergo an in-laboratory CPAP titration with either a nasal mask or an oronasal mask. Subjects were then assigned this mask for 3 weeks of at-home CPAP use with the optimal treatment pressure determined on the laboratory study (CPAP M=8.4 cm of H₂O). At the end of this 3-week period, data were collected from the CPAP machine and the subject was given the other mask to use with the same CPAP settings for the next 3 weeks at home (if the nasal mask was given initially, the oronasal one was given later and vice versa). On completion of the second 3-week period, data on residual AHI were again collected and compared with the first 3-week period on CPAP.

RESULTS:

A Wilcoxon Signed-Rank Test (two-tailed) revealed that residual AHI with CPAP treatment was significantly higher with the oronasal compared with the nasal mask ($z = -3.296$, $p < 0.001$). All 14 subjects had a higher residual AHI with the oronasal versus nasal mask, and 50% of the subjects had a residual AHI $> 10/h$ in the oronasal mask condition, even though all of these subjects were titrated to an AHI of $< 5/h$ in the laboratory.

CONCLUSION:

A higher residual AHI was seen in all patients with the use of an oronasal mask compared with a nasal mask. Switching to an oronasal mask post titration results in an increase in residual AHI with CPAP treatment, and pressure adjustment may be warranted.]

Abstract. Oral continuous positive airway pressure for sleep apnea: effectiveness, patient preference and adherence

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Clin Chest Med.
2010 Jun;31(2):203-20.

BACKGROUND: Nasal continuous positive airway pressure (CPAP) is the most definitive medical therapy for obstructive sleep apnea (OSA). Many patients have difficulty tolerating nasal CPAP due to nasal airway problems, mouth leak, and general discomfort from the mask and headgear. These limitations may be overcome by an oral mask (Oracle; Fisher & Paykel Healthcare; Languna Hills, CA) that does not require headgear. We performed a study to compare the Oracle mask to conventional nasal and oronasal masks in the effectiveness of CPAP delivery and patient satisfaction and adherence.

METHODS: Ninety-eight, consecutive CPAP-naïve patients with OSA diagnosed by overnight polysomnography (apnea-hypopnea index [AHI] > 5) were referred for CPAP therapy. All patients were presented with a variety of CPAP masks, including nasal, oronasal, and Oracle, and reasons for mask choice were documented. After 3 weeks of acclimatization to the mask of their choice, patients had a CPAP titration sleep study to determine their optimal CPAP level. Further follow-up was obtained 2 months and 6 months later with a subjective patient assessment of CPAP use and efficacy, mask comfort, and upper airway dryness.

RESULTS: Patients were predominantly male (70%), middle aged (50.6 \pm 11.7 years), and moderately obese (body mass index, 32.5 \pm

9.0) with severe OSA (AHI, 40.6 \pm 25.8/h) [mean \pm SD]. Patients were classified into three groups based on their choice of mask: nasal (66%), Oracle (27%), and oronasal (7%). Baseline characteristics did not differ significantly between groups. Optimal CPAP was not significantly different between mask groups (nasal, 7.7 \pm 2.1 cm H₂O; Oracle, 8.0 \pm 2.0 cm H₂O; oronasal, 9.7 \pm 3.2 cm H₂O; p = 0.267). Subjective ratings of adherence, efficacy, and mask comfort were also similar between groups. However, the Oracle group had more complaints of upper airway dryness and „rain-out.“ The oronasal group had a disproportionately greater number of dropouts from CPAP therapy than the Oracle group (57% vs 19%, p = 0.046). Nine patients changed from the Oracle mask to a nasal mask during the study, whereas no patients changed from their nasal or oronasal masks.

CONCLUSIONS: The Oracle mask is an efficacious interface for long-term CPAP therapy in patients with OSA. The main limitations of the mask are upper airway dryness and rain-out associated with heated humidification, which may be improved by further technical modifications. Oracle may be more acceptable than oronasal masks for patients who cannot rely exclusively on the nasal airway for CPAP therapy.

