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Adherence to APAP in Obstructive Sleep Apnea Syndrome: effectiveness of a motivational intervention

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De acordo com o art.3 do capítulo "Tarefas a Realizar" do Regulamento do Mestrado em "Comunicação Clínica", a presente Dissertação consta da apresentação de um trabalho, a saber:

- Realização de um artigo de investigação com publicação submetida em Revista científica que constituirá a matéria da dissertação para obtenção do Grau de Mestre.

"Não há no mundo, exagero mais belo que a gratidão"

Jean La Bruyére

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ÍNDICE

Artigo de investigação: "Adherence to APAP in Obstructive Sleep Apnea Syndrome: effectiveness of a motivational intervention"

ABREVIATIONS

OSAS- Obstructive Sleep Apnea Syndrome

AHI - Apnea Hypopnea Index

CPAP - Continuous Positive Apnea Pressure

APAP - Auto-titrating Positive Airway Pressure

PAP - Positive Airway Pressure

MI - Motivational Interviewing

COPD - Chronic Obstructive Pulmonary Disease

ESS - Epworth Sleepiness Scale

BMI - Body Mass Index

IG - Intervention Group

CG1 - Control Group1

CG2 - Control Group2

SPSS - Statistical Package Social Sciences

ARTIGO DE INVESTIGAÇÃO

"Adherence to APAP in Obstructive Sleep Apnea Syndrome: effectiveness of a motivational intervention"

RESUMO

Objetivos: A Síndrome da Apneia Obstrutiva Do Sono (SAOS) é uma doença crónica, com consequências significativas a nível pessoal e social. A adesão ao tratamento por pressão positiva automática da via aérea (APAP) é muitas vezes inferior ao esperado, pondo em risco o sucesso do tratamento. Neste estudo, investigou-se a eficácia de uma intervenção educacional que utilizou estratégias motivacionais na adesão ao tratamento em doentes com SAOS.

Desenho: Estudo randomizado e controlado.

Local do estudo: Os pacientes foram recrutados sucessivamente da população de primeiras consultas de um laboratório de patologias de Sono.

População: Sessenta e um pacientes diagnosticados com SAOS e com critérios para tratamento por APAP foram randomizados e alocados a um grupo de intervenção (GI) e dois grupos controlo (CG1 e CG2).

Intervenção: No GI foram utilizadas estratégias motivacionais aplicadas de acordo com a fase de mudança do paciente, avaliada pela escala de confiança e convição. No CG1, os pacientes receberam exclusivamente informação padronizada e no GC2 foram seguidos os procedimentos de rotina. A adesão ao tratamento, foi avaliada ao primeiro (T1) e segundo (T2) mês de tratamento com APAP, recorrendo aos parâmetros registados no *software* do ventilador.

Medidas e resultados: As variáveis em análise incluíram o índice de apneia/ hipopneia (IAH), Escala de Sonolência de Epworth (ESE), características socio demográficas e clínicas. O GI apresentou maior adesão ao APAP avaliada através da percentagem de dias de uso com mais de 4 horas de utilização (p=0.013), média de dias de uso efetivo

(p=0.000) e redução do índice de IAH (p=0.019) após dois meses de tratamento, quando comparado com os outros dois grupos. No GI o grau de confiança em usar o APAP aumentou de T1 para T2 (p=0.000). A ESE apresentou uma redução significativa (p=0.001) no GI e no CG2 (p=0.003) em T2 aumentando o seu score no CG2 (p=0.015).

Conclusões: Na população estudada a intervenção implementada utilizando estratégias motivacionais aumentou a adesão ao APAP.

Palavras chave: Síndrome da Apneia Obstrutiva do Sono, pressão positiva automática da via aérea, adesão, estratégias motivacionais.

ABSTRACT

Study Objectives: Obstructive Sleep Apnea Syndrome (OSAS) is a serious disorder with significant personal and social consequences. Treatment adherence by Auto-titrating Positive Airway Pressure (APAP) is often below expectations, challenging the expected outcomes. We investigated the effectiveness of a brief educational intervention using motivational strategies in treatment adherence among patients with OSAS.

Design: Randomized controlled study

Setting: Patients were consecutively recruited from first admissions in a Sleep Disorders Unit.

Patients: Sixty one patients diagnosed with OSAS meting criteria for APAP therapy were randomly allocated to an intervention group (IG) and two control groups (CG1 and CG2).

Interventions: In the IG motivational strategies were applied according to patient's motivation, assessed by the degree of confidence and conviction. In the CG1, participants received exclusively standardized information and in the CG2 routine procedures were followed. Adherence to treatment was measured after one (T1) and two months (T2) through the APAP monitorization.

Measurements and Results: Assessment included the Apnea Hypopnea Index (AHI), the Epworth Sleepiness Scale (ESS), socio demographic and clinical information. The IG presented higher adherence to APAP- percentage of days of use>4 hours (p=0.013), mean effective use per effective day (p=0.000) and lower AHI (p=0.019) at T2 when compared with the others two groups.

Confidence was higher in the IG group at T2 than at T1 (p=0.000). The ESS presented a significant reduction (p=0.001) in the IG and in the CG1 (p=0.003) at T2, but was higher in the CG2 (p=0.015).

Conclusions: Brief interventions using motivational strategies can improve patient´s adherence to APAP.

Key words: Obstructive Sleep Apnea Syndrome, Auto-titrating Positive Airway Pressure, adherence, motivational strategies.

INTRODUCTION

1 Obstructive Sleep Apnea Syndrome

Obstructive Sleep Apnea Syndrome (OSAS) has been considered in the past three decades a major health problem[1]. OSAS is a chronic sleep disorder characterized by partial reduction and/or total obstructions of breathing resulting from a predominantly inspiratory pharyngeal collapse during sleep[2]. This phenomenon occurs intermittently during sleep and leads to sleep fragmentation[3]. It is estimate that OSAS affects approximately 3-7% of male and 2-5% of females[4]. There are several risk factors responsible for the onset of OSAS, including male gender advanced age, obesity, craniofacial abnormalities, smoking and alcohol consumption[5]. On the other hand OSAS contributes to the onset of cardio respiratory and neuropsychiatric disorders[6]. Patients with severe OSAS have a higher prevalence of hypertension, arterial fibrillation, no sustained ventricular tachycardia[7]. The cognitive impairment, changes in personality and behavior are also frequent findings in patients affected by this disorder[8]. Other main consequence is an increased risk of traffic accidents due to a disturbed motor response[9]. Social relations are also affected and often these patients report social introversion, lack of interest in interpersonal relationships and marital problems[10]. According to the guidelines of the *American Academy of Sleep Medicine*[11], OSAS severity can be defined by the Apnea Hypopnea Index (AHI) representing the number of apneas plus hypopneas per 1 hour of sleep. Scores equal to or greater than 5/h define the presence of OSAS, and can be subdivided into three severity levels: mild when the AHI is between 5 and 15/h, moderate when the AHI is between 15 and 30/h and severe when the AHI is above 30/h.

The main objective of the OSAS treatment is to reduce the resistance of the upper airway increasing the diameter of the oropharynx, consequently avoiding the appearance of obstructive apnea during sleep[12]. The gold standard method used is the application of continuous positive air pressure in the upper airway by a ventilator - Continuous Positive Apnea Pressure (CPAP) [13.] With this device the air pressure is titrated in order to reduce AHI to 5 episodes per hour[14, 15]. The efficacy of the CPAP is well established: the daily use reduces AHI and drowsiness[16], decreases blood pressure values[17], improves the quality of life of the patients[18] and of his partner[19] and proved to be effective in reducing traffic accidents[20]. Marti and co-workers reported a reduced mortality rate in patients treated with CPAP[21].

Technical advances in positive-pressure therapy have led to the development and application of automatic systems for auto-titrating positive airway pressure (APAP) [13].

2 Adherence therapy in patients with OSAS

According to Taylor[22] adherence can be defined as "the degree that the individual follows medical advice or recommendation associated with the disease"

The criteria for adherence to PAP therapy, establish its use for more than 4 hours per night on 70% of the nights during a consecutive period of 30 days, in the first three months of treatment[23]. Some authors have reported that patients in long term treatment should use PAP for 4-5 hours on overage per night with a prescribed pressure[24].

Weaver and coworkers[25] found that 6 hr per night are needed to normalize scores on the functional outcomes of sleepiness scale, whereas Campos-Rodriguez and coworkers[26] demonstrated significant benefit for cardiovascular events in individuals with 1 to 6 hr of nightly use compared to those using less than 1 hr per night. The author also found

that a regular adherence to treatment is necessary to improve the symptoms of OSAS and longitudinal studies have demonstrated a 5 years higher survival rate for patients who used the ventilator regularly, compared to nonusers[26].

Adherence rates for the use of PAP showed to resist to the powerful arguments favoring this therapeutic approach. In a study carried out by Kribbs and coworkers[27], the authors noted that in the first three months of treatment, less than 50% of patients used the ventilator positive airway pressure (PAP) for a minimum of 4 hours per night on 70% nights, and only 6% of the treated patients adhered to treatment at least 7 hours per night on 70% of the nights.

Several factor are known to reduce patient`s adherence to PAP. Some are related to the technical characteristics of the equipment, and others result of the changes in life and stigma introduced by the ventilator treatment in patients routine[28]. A number of side effects may arise from the use of PAP; intolerance to the air pressure supplied by the ventilator, difficulty in exhaling air and air leaks to the outside of the mask[24]. Cutaneous intolerance to the mask, namely irritation, pain, rash and other skin lesions or irritation of the nasal mucosa are also frequent complains probably contributing to diminished adherence[25].

Educational programs also aimed to minimize these effects and enhance patients 'ability to cope with the treatment[20]. Mounting attention has been given to the influence of the psychological factors on adherence to PAP, and Haniffa and collaborators[29], concluded that "there is some evidence that psychological intervention/education improves adherence to PAP". More recently a group education session proved to enhance the number of days of APAP use[30]. The progressive inclusion of monitoring programs in

ventilator devices permits a more objective assessment of the effective use of ventilation and to evaluate adherence to treatment[31].

3 Motivational Interview

According to Miller and Rollinick, Motivational Interviewing (MI) is defined as a psychotherapeutic approach designed to trigger behavior change by helping the patient to explore and resolve ambivalence. For these authors, behavior change depends on motivation, the perception of the importance of the change and confidence in the ability to change[32]. A strong sense of purpose, clear strategies and skills for pursuing that purpose and a sense of timing to intervene in particular ways at incisive moments are core concepts of the MI[33]. Four fundamental principles guide MI practice: expressing empathy for the patient perspective, the development of discrepancy between values and behavior, rolling with resistance and support and amplify patient´s self confidence. For the change process to occur, the patients must engage in a thoughtful assessment and decision-making process about the change itself and self-evaluate their capacity to work through the change[33]: These two dimensions are defined as "conviction" and "confidence". The easiest way to assess a patient's conviction and confidence levels is to use a 0 to 10 ruler to help patients determine how important a change is and how confident he is in making that change[34].

Motivational Interviewing strategies have showed to be useful in enhancing adherence to preventive and therapeutic strategies [32, 35]. Previous studies showed that MI can have a role in adherence to PAP, and is able to reduce the patient´s ambivalence about the use of the device[36, 37].

The present study aimed to evaluate the effectiveness of an intervention using MI strategies in patient's adherence to OSAS treatment using APAP. The intervention consisted in the implementation of strategies to increase motivation and reduce ambivalence linked to the use of ventilation procedures. The effective use of ventilation was collected through the device monitoring programs in all participants.

MATERIAL AND METHODS

Population

A total of 61 adults were invited to participate, recruited consecutively from a Sleep Disorders Unit. All participants had been previously diagnosed with OSAS, trough a cardiorespiratory polygraphic assessment. The assessment consisted of multi-channels continuous polygraphic recording from nasal pressure transducer for nasal airflow, thoracic and abdominal impedance belts for respiratory effort, pulse oximetry and an intern microphone for snoring, in order to identify different types of apneas and hypopneas during sleep. Inclusion criteria were an AHI of 15/h or higher and indication for ventilator therapy. Regular procedures postulate that all selected participants are scheduled for a medical consultation and have access to the ventilator device in order to initiate therapy within for a maximum of seven days after the diagnosis. Participants with chronic obstructive pulmonary disease (COPD), neuromuscular disease, heart disease, neurological disease and patients taking psychotropic drugs were excluded from the study.

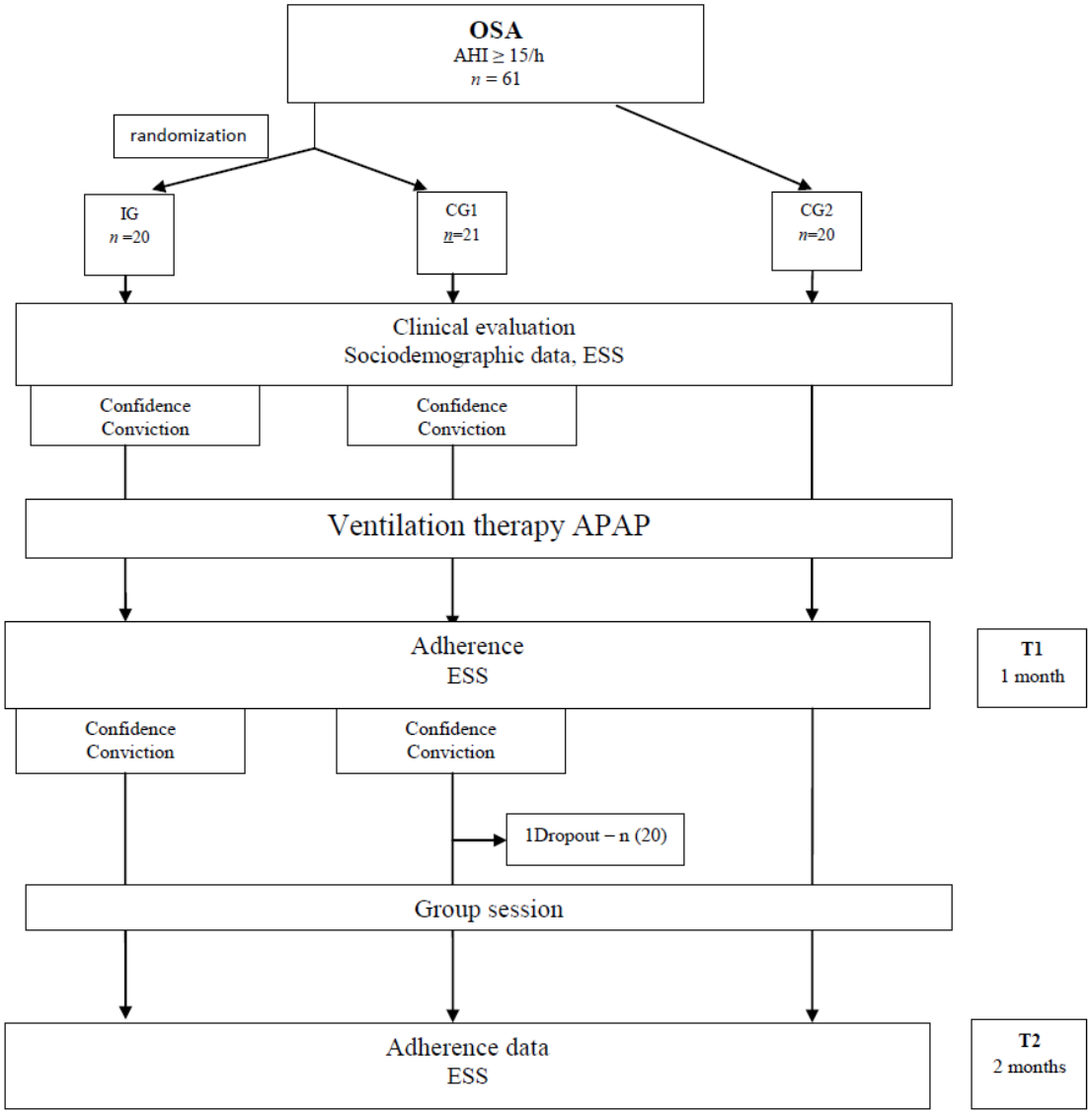
Procedures

Forty one patients were allocated, according to a list of random codes generated by the Excel 2007 program, to the intervention group (IG) and the control group1 (CG1). The control group 2 (CG2) was obtained from the remaining patients fulfilling the inclusion criteria. In IG and CG1 two questions were used to elicit patient's conviction and confidence: "How important is for you the use of the ventilator in your treatment? and "How confident are you that you can use the ventilator?". The degree of conviction and confidence permitted to establish the individual stage of change[38] and to define specific strategies to be applied in an individual 10 minutes interview. During the intervention beliefs, expectations and feelings of the patient were assessed. We postulate according Prochaska and co-workers[39-42] that a **pré-contemplation stage** corresponded to a score of 0 to 3, in each scale. At this stage, they were informed about the disease, the possible benefits of the treatment and of the risks of non compliance with the treatment. To be considered in the **contemplation stage** patients had to rate their conviction between 2 and 5 and their confidence between 5 and 8. At this stage, the intervention focused on emphasizing intrinsic motivation and reaffirming the autonomy of the patient choice. When patients rated their conviction between 6 and 8 and their confidence between 7 and 10 they were considered in the **preparation stage**. In this stage, they were assisted to develop concrete plans and to clarify objectives. At the end of the session a new interview was scheduled and written information was delivered about OSAS disease and treatment. In the CG1, participants received exclusively standardized information about the ventilator and mask during a 10 minutes interview, regardless confidence and conviction scores and at the end of the session a

new interview was scheduled. The CG2 included patients submitted to routine procedures.

One month latter the degree of conviction and confidence was reassessed in CG1 and IG patients. All participants were submitted to the standardized group educative session[30], and the effective use of ventilation was assessed trough the APAP monitorization in all the participants. Participants flow, group allocation and procedures are detailed in Figure 1.

Figure 1 Participants selection Flowchart IG - intervention group, CG1 - control group1; CG2 - control group2.



Measures and instruments

1. The AHI, provide a measure of OSAS severity and was determined in all the patients. A moderate to severe OSAS (AHI ≥15 events per hour) was used as inclusion criteria, according to the criteria of the *American Academy of Sleep Medicine*[11].

2. Socio demographic information, tobacco and alcohol consumption were collected in all participants. Clinical information was obtained from the clinical file and included Body Mass Index (BMI) and medical comorbidities (hypertension, diabetes and dyslipidemia).

3. The Epworth Sleepiness Scale (ESS) is a self-administered questionnaire which provides a measure of a person's general level of daytime sleepiness[43, 44]. There is a high level of internal consistency within the ESS, as assessed by Cronbach's alpha statistic (alpha = 0.88).

4. The APAP device used was AutoSet S9 (ResMed) and utilization was monitored using the Smart CardTM technology provided with the Resmes- Resscan, Software. Adherence was measure by the total number of hours of daily use at the prescribed pressure, the percentage of days of use, the mean effective use per effective day, and the residual AHI (events per hour). Adherence PAP definition, establish its use for more than 4 hours per night on 70% of the nights during a consecutive period of 30 days[27].

Statistical Analysis

Data analyze was conducted using the Statistical Package Social Sciences (SPSS) version 20 .The significance level was set at 0,05 for all the analyzes. Data are reported as means, standard deviations, and percentages. Socio demographic and disease severity data were compared using Anova test and Tukey tests for group differences. The paired sample t-test was used to determine significant differences between the different groups of participants. The chi-square test was used to compare frequencies and proportions between groups. General linear Model repeated measures was used to compared differences between and within groups in different treatments moments.

Ethical considerations

This study was submitted to and approved by the Ethical Committee of the Hospital São João EPE, approved data on 28 February 2013. Participants received information about the study after which they gave their written informed consent. The confidentiality and privacy of the collected data were guaranteed according to the Declaration of Helsinki.

RESULTS

1 Socio demographic and clinical characterization

Sixty one patients were included in the present study with a median age of 56.5 (SD 10.0) years. The majority were males (77%), predominantly married (93%) and with a low mean educational level of 7.1 (SD 3.5) years. Regarding professional status and alcohol consumption no differences were detected between the studied groups. On the contrary CG1 presented statistically significantly less regular smokers than the two other groups. Clinical variables namely BMI, Hypertension, Diabetes and Dyslipidemia were similar in all the participants, with a significant number of patients presenting high blood pressure (82%). The standardized OSAS evaluation revealed that the majority of the patients presented a severe form of the disorder regardless of the group (74%). Table 1 presents the socio-demographic and clinical characterization of the three studied groups.

Table 1 Socio demographic and clinical characterization

Variables	Total n= 61	IG n= 20	CG1 n= 21	CG2 n= 20	*P*
Gender[a]					
Male	47 (77%)	13 (65%)	18 (86%)	16 (80%)	0,268[d]
Female	14 (23%)	7 (35%)	3 (14%)	4 (20%)	
Age(years)	56.5 (10.0)	56.2 (11.2)	56.4 (8.5)	57.1 (10.6)	0.960[c]
Marital status[a]					
Single	1(2%)	0 (0%)	1 (5%)	0 (0%)	
Married	57 (93%)	17 (85%)	20 (95%)	20 (100%)	0,216[d]
Divorced	2 (3%)	2 (10%)	0 (0%)	0 (0%)	
Widow/Widower	1 (2%)	1 (5%)	0 (0%)	0 (0%)	
Education (years)[b]	7.1 (3.5)	6.8 (3.4)	7.4 (3.5)	6.9 (3.6)	0.152[c]
Education level[a]					
<4	27 (44%)	9 (45%)	8 (38%)	10 (50%)	
4-9	21 (35%)	7 (35%)	9 (42%)	5 (25%)	0.841[d]
9-12	8 (13%)	2 (10%)	2 (10%)	4 (20%)	
>12	5 (8%)	2 (10%)	2 (10%)	1 (5%)	
Professional situation[a]					
Active	35 (57%)	8 (40%)	12 (57%)	15 (75%)	0.263[d]
Inactive	26 (43%)	12 (60%)	9 (43%)	5 (25%)	
Present or former smoker[a]	32 (53%)	8 (40%)	12 (57%)	12 (60%)	0.418[d]
PY[b]	16.0 (21%)	14.4 (24%)	19.0 (22%)	14.5 (18%)	0.723[c]
No smoker	29 (47%)	12 (60%)	9 (43%)	8 (40%)	0,418
Alchool consumption[a]	37 (61%)	15 (75%)	8 (38%)	14 (70%)	0.031[d]
gr/day[b]	26.3 (30.7)	12.1 (21.5)	15.3 (17.7)	17.8 (24.3)	0.152[c]
BMI (Kg/m^2)[b]	32.9 (5.8)	34.8 (7.2)	32.5 (5.0)	31.3 (4.6)	0.152[c]
Medical comorbidities[a]					
Hypertension	44 (82%)	12 (71%)	17 (94%)	15 (79%)	0.181[c]
Diabetes	14 (26%)	4 (24%)	7 (39%)	3 (16%)	0.267[c]
Dyslipidemia	28 (52%)	10 (59%)	10 (56%)	8 (42%)	0.562[c]
AHI[a]					
Moderate=15	16 (26%)	6 (30%)	5 (24%)	5 (25%)	0.893[d]
Severe>30	45 (74%)	14 (70%)	16 (76%)	15 (75%)	

[a] n (%); [b] mean (SD), [c] Tukey test; [d]Chi-square test. BMI - Body Mass Index, AHI -Apnea Hypopnea Index, PY –Pack Years.

2 Adherence to APAP therapy

Participant's adherence to APAP treatment was evaluated after the first (T1) and second month (T2) in all participants. The percentage of days with more than four hours of APAP use, mean effective use of ventilation per day and AHI were used to assess adherence to ventilator therapy. Results showed that at T1 no statistically significant differences were detected between the groups. After two months of treatment (T2) on the contrary, a statistically significant higher use of APAP was detected in the IG, regarding the percentage of days used>4 hours (p=0.013) and the mean effective use per effective day (p=0.000) when compared with the others two groups. The AHI revealed a trend to a lower score in the IG participants (p=0.019) Comparing the T1 and T2 measures in each group, statistically significant differences were detected in the IG regarding the percentage of days with more than four hours of ventilator use (p = 0.031) (Figure 2), and the mean effective use per effective day (p=0.011). In the CG1 the mean effective use per effective day presented a statistically significant lower value (p=0.003) (Table 2).

Figure 2 - Percentage of days with more than 4 hours use in the three groups studied

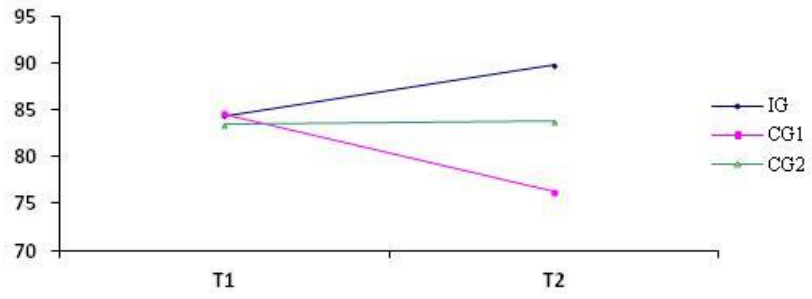


Table 2 – Adherence to APAP therapy

		IG n=20	CG1 n=21	CG2 n=20	*P*[d]
Days of APAP use[a]					
	T1	84.4% *	82.5%	83.3%	0.013 *
	T2	89.8%	76.3%	82.2%	
Mean use per effective day[a,b]					
	T1	5.7 (1.4) **	5.7 (1.3)	5.9 (1.5)	0.000**
	T2	6.2 (1.3)	5.1 (1.4)	5.1 (1.3)	
AHI [b]					
	T1	3.5 (3.9)	3.4 (2.8)	3.3 (3.5)	0.526
	T2	2.7 (2.7)	3.7 (3.1)	3.0 (3.3)	

[a] mean (SD), [b] hour, *p<0.05,** p<0.005

3 Conviction and confidence evaluation

The conviction and confidence regarding the use of the APAP was assessed in IG and CG1 patients at T1 and T2. In the conviction score was similar in the two groups, and no differences were detected within each group when comparing the scores at the two evaluations. For the confidence scale a statistically significant higher sore was detected in the IG group at T2, when compared with T1 (p=0.000) and with CG1 at T2 (p=0.001) (Table 3 and Figure 3).

Figure 3 - Confidence evaluation

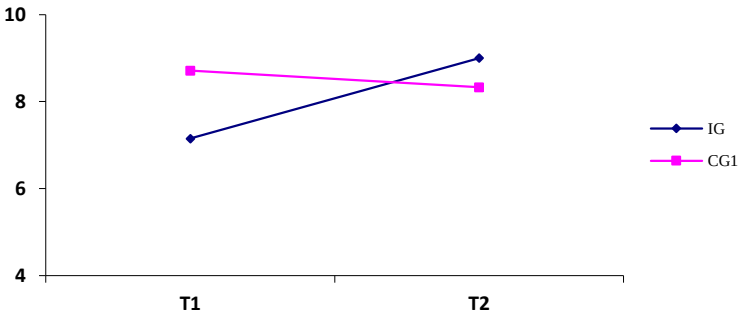


Table 3 – Conviction and confidence evaluation

	IG n= 20	CG1 n=21	p
Conviction scale [a]			
T1	8.6 (2.2)	8.9 (1.7)	0.563
T2	8.9 (1.6)	8.1 (2.7)	
Confidence scale [a]			
T1	7.2 (2.0)	8.7 (1.6)	0.066
T2	9.0 (1.6) **	8.3 (2.9)	

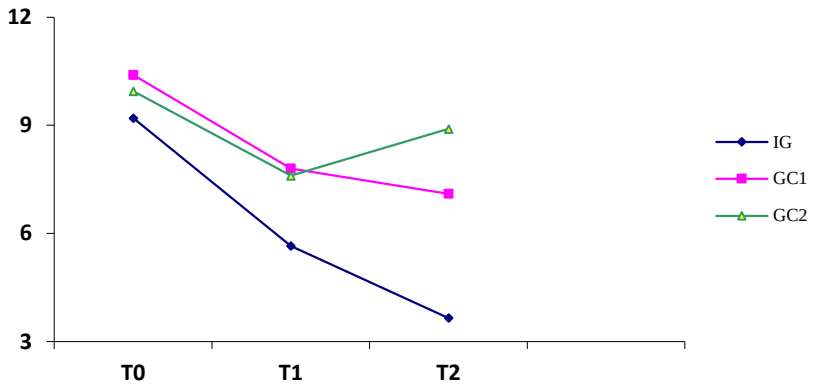
[a]= n (SD), * *p<0.005

4 Evaluation of daytime sleepiness (ESS)

The ESS scores at baseline were similar in the three groups (p=0.105). Comparing with baseline assessment, lower scores at the T1 and T2 evaluation were detected in all participants. In the IG group (p=0.000) and in the ICG1 (p=0.008).

ESS score was statistically significantly lower in T1 when compared with T0, and when comparing T1 and T2 (p=0.001 and p=0.003 respectively). Interestingly in the CG2 the ESS score was higher in the T2 than in the T1 (p=0.015) (Figure 4).

Figure 4 - Evaluation of daytime sleepiness (ESS)



DISCUSSION

Obstructive Sleep Apnea Syndrome is common disorder, with relevant health costs[6-10] associated with significant negative consequences for both the patient and family. Positive Airway Pressure (PAP) is the most commonly prescribed treatment for OSAS. Although efficient in reducing daytime sleepiness and mental and physical impairment[45,46], PAP is a demanding treatment often reported by the patients as difficult to adhere. This study explores the application of a brief educational and motivational intervention aiming to improve APAP adherence in a group of naive user patients.

In line with previously reported our sample presents a higher number of male patients with elevated Body Mass Index (BMI)[47] and alcohol consumption[48], physical and mental long term consequences of OSAS[49], include an increased likelihood of developing chronic conditions namely hypertension, and other cardio vascular disorders[50]. Accordingly a significant proportion of the studied patients presented

hypertension, reinforcing the value of this PAP indication, recent evidence suggests that PAP may be effective in decreased blood pressure, and cardiovascular events[17].

This chronic disease has major implications in the sleep circle and recurrent sleep arousals and sleep fragmentation associated with the disorder may lead to daytime sleepiness[51]. In the present study daytime somnolence was evaluated with the ESS. Reinforcing the evidence that daytime sleepiness contributes to absence from work and decreased work productivity[52] we detected a significant proportion of professionally inactive subjects in our sample. Moreover daytime sleepiness is a prevalent feature of the syndrome that may predict ongoing PAP use[53]. In our study the improvement of ESS scores was associated with higher APAP adherence. In agreement with Engleman and coworkers who found no correlation between severity of OSAS and PAP usage[54] we did not detect differences between the AHI severity and the adherence and no correlation between these two variables.

Despite the numerous positive outcomes experienced by patients who use PAP, the effectiveness of this treatment is limited by suboptimal adherence rates[55]. "The simple yet important fact that treatment efficacy often depends on patient adherence"[56] has raised the interest on motivational issues when patients need behavior change interventions and/or when the illness was chronic[57]. Motivational strategies have proved to be useful in helping patients to improve their adherence to therapeutic and preventive procedures[36,37,58]. Patient's collaboration is crucial to adherence to PAP and compliance with side effects of the treatment[59], and a significant number of studies have reported beneficial results emerging from educational and informative interventions[30,36,37]. The present study presents an original intervention using MI strategies applied in order to improve APAP adherence. A higher adherence was detected in the patients submitted to the educational and motivational intervention, according with the results reported in

adherence to medication and screening exams using similar approaches. Assessment was performed according recognized definitions of APAP adherence - percentage of days with more than four hours of APAP use, mean effective use of ventilation per day[30, 60] and AIH.

Moreover several of the earliest studies on APAP adherence were designed to examine short-term adherence rates[15,25]. We examined APAP use at 1 and 2 months of treatment, verifying an effective improvement at the second evaluation. Previous results have stated the importance of adherence maintenance and described different outcomes when interventions were assessed early on latter in treatment evolution[61, 62].

Confidence and conviction rulers were used to assess the patient's stages of change and implement the adequate response from the technician. To determine the importance of APAP therapy (conviction) and patient's belief in his ability to follow it (confidence) permitted to tailor information, discuss future plans and emphasize patient's control. Similar results were found in the studied subjects at first evaluation, but an increased confidence was detected in the intervention group even before the adherence rates improvement. This increment, not seen in the group submitted to standardized information, point to the importance of assessing the readiness to change and even more to personalize the intervention, in order to enhance patient compliance.

We confirmed that a brief interview (10 minutes length), using specify strategies according motivational phase, enhanced patients adherence to APAP therapy. To assess patients' beliefs about their health, the disease and its risks, listening to their emotions and fears permitted to amplify their confidence. Tailored information about the possible benefits of the treatment, the risks of non compliance and helping to develop concrete plans and to clarify the importance of the daily use of ventilator therapy conducted to a more regular use of the treatment than delivery of exclusively standardized information.

This study has several limitations, namely the small number of participants and the absence of data on technical difficulties resulting from the interface of the APAP device.

CONCLUSION

In conclusion, when patients initiate PAP frequently report change in their life style[14] and several factors potentially influence the level of PAP compliance and overall adherence[29, 31.]The present study provides support for the benefit of motivational interventions in APAP adherence. Moreover results reinforce the feasibility and efficacy of a brief, tailored approach performed by prepared technicians. The socio demographic characteristics of our population also indicate that MI interventions are accessible and well accepted by populations with reduced educational achievement. Similar interventions could be applied and easily incorporated in routine care.

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