Original Article / Özgün Araştırma

Survey of Knowledge and Attitudes about Obstructive Sleep Apnoea Among Italian Anaesthetists

İtalyan Anestezi Uzmanlarının Obstrüktif Uyku Apnesi Hakkındaki Bilgileri ve

Yaklaşımlarının Araştırılması

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Abstract / Öz

Objective: As the care of Obstructive Sleep Apnoea (OSA) patients remains heterogeneous, we hypothesized that it may reflect insufficient OSA knowledge/awareness among clinicians.

Methods: OSA Knowledge/Attitude Questionnaire (OSAKA) was translated into Italian and distributed to anaesthetists attending SIAARTI National Congress and Airways courses and Hands-on Workshops from October 2012 to June 2013.

Results: In total, 370 anaesthetists returned the questionnaires (response rate, 62%); the median (interquartile range [IQR]) knowledge score was 12 (10-14), and the range was 1–17 with no difference by gender, age, professional title or years of practice. The knowledge items achieved a mean rate of corrected response of 66%±0.14%. With regard to attitude items, median (IQR) score was 15 (13-17) and range was 0–20. Females and anaesthetists with >15 years of practice reached higher scores, while anaesthesia residents showed a lower attitude score. Gender and professional title were statistically associated with the attitude score (gender: F=14.6, p=0.0002; professional title: F=4.72, p=0.0099), whereas a weak association was observed within years in practice and attitude score (F=2.6, p=0.0519). Knowledge score correlated positively with attitude score (r=0.4, p<0.0001). For knowledge domains, there was a positive correlation between pathophysiology (mid-grade: r=0.3, p<0.0001), symptoms (low grade: r=0.2, p<0.0001), diagnosis (mid grade: r=0.3, p<0.0001) and the attitude score. Correlation close to zero was observed for epidemiology and treatment domains (r=0.09, p=0.06; r=−0.01, p=0.78, respectively).

Conclusion: The results of our survey demonstrate lack of knowledge about OSA and its treatment, revealing the need to update the syllabus of teaching in medical practice and in national health care policies to improve perioperative care.

Keywords: Obstructive sleep apnoea, perioperative outcome, uvulopalatoplasty, continuous positive airway pressure

Amaç: Obstrüktif uyku apnesi (OSA) olan hastaların bakımının heterojen olmasından dolayı, klinisyenlerin yetersiz OSA bilgisi/farkındalığını yansıtabileceğini varsaydık.

Yöntemler: OSA Bilgi/Yaklaşım Anketi (OSAKA) İtalyanca'ya çevrildi ve Ekim 2012 ile Haziran 2013 tarihleri arasında SIAARTI Ulusal Kongresine, Havayolu Kurslarına ve uygulamalı çalıştaylara katılan anestezi uzmanlarına dağıtıldı.

Bulgular: Toplam 370 anestezi uzmanı anketi yanıtladı (yanıtlama oranı %62). Medyan (çeyrekler arası aralık [IQR]) bilgi skoru 12 (10-14) olarak ve dağılım cinsiyet, yaş, unvan ve uygulama yılı açısından herhangi bir fark olmaksızın 1 ile 17 arasında bulundu. Bilgi sorularına verilen ortalama doğru yanıt oranı %66±%0,14 idi. Yaklaşım sorularında medyan (IQR) skoru 15 (13-17) idi ve dağılım 0 ile 20 arasındaydı. Anestezi asistanları daha düşük yaklaşım skoru gösterirken, kadınların ve 15 yıldan daha uzun süredir uygulama yapan anestezi uzmanlarının skorları daha yüksekti. Cinsiyet ve profesyonel unvan (cinsiyet: F=14,6, p=0,0002; profesyonel unvan: F=4,72, p=0,0099) ile yaklaşım skoru arasında istatiksel olarak anlamlı bir ilişki bulundu, ancak uygulama yılı ile yaklaşım skoru arasında zayıf bir ilişki saptandı (F=2,6, p=0,0519). Bilgi skoru ile tutum skoru arasında pozitif bir korelasyon vardı (r=0,4, p<0,0001). Çalışma alanları açısından, patofizyoloji (orta derece: r=0,3, p<0,0001), semptomlar (düşük derece: r=0,2, p<0,0001), tanı (orta derece: r=0,3, p<0,0001) ve tutum skoru arasında pozitif bir korelasyon bulundu. Epidemiyoloji ve tedavi alanları açısından sıfıra yakın bir korelasyon gözlendi (sırasıyla r=0,09, p=0,06; r=−0,01, p=0,78).

Sonuç: Çalışmamızın sonuçları OSA ve tedavisi hakkında bilgi eksikliği olduğunu göstermekte, perioperatif bakımın iyileştirilmesi için tıbbi uygulamada ve ulusal sağlık bakımı politikalarında eğitim müfredatının güncellenmesi gerektiğini ortaya koymaktadır.

Anahtar Sözcükler: Obstrüktif uyku apnesi, perioperatif sonuç, uvulopalatoplasti, sürekli pozitif havayolu basıncı

Introduction

Obstructive Sleep Apnoea (OSA) results from a decrease on upper airway patency during sleep and is characterised by repetitive occlusions, complete or partial of the airway. These abnormalities lead to alterations in gas exchange resulting in sleep fragmentation, hypoxemia, hypercapnia and long-term cardiovascular sequelae (1). Twenty-six percent of the US adult population is thought to be at high risk for OSA (2), which remains a silent pandemia, with a prevalence in middle-aged adults aged between 30 and 60 years of 3%-4% in men and 2% in women (3, 4). In most cases, the frequency of OSA in the surgical population is increasingly recognised as a common disorder with substantial perioperative morbidity, and it has recently been demonstrated that the incidence is substantially higher than in the general population, with values ranging from 24% in general surgery patients up to 70% among bariatric surgery patients (5-7). However, in most of these patients, the problem is not recognised (8), and this lead to an increased risk of perioperative life-threatening complications (9). In response to the need for a standardised approach with the aim of increasing the perioperative safety of patients with OSA, a task force of the American Society of Anesthesiologists (ASA) published practice Guidelines in 2006 (10), which claim the need for anaesthetists to screen every patient scheduled for surgery for OSA to reduce the risk of adverse events. However, the ASA Guidelines are not widely accepted, and the search for an optimal perioperative care strategy of patients with OSA is hindered by inadequate evidence.

In 2012, the Italian Society of Anaesthesia, Analgesia, Resuscitation and Intensive Care (SIAARTI) and the Italian Association of Sleep Medicine (AIMS) published a position paper regarding the recommended preoperative evaluation needs and pathway for the perioperative care of patients with OSA (11), which also suggests that behaviours aimed at reducing the risk of intra- and postoperative complications. Practical algorithms to discover patients suffering from OSA are included and the *STOP BANG* questionnaire (12), suggested as a preoperative screening tool for all patients. Nevertheless, despite agreement in literature supporting the need for institutional guidelines for the safest management of OSA patients, preoperative care of such patients continues to be heterogeneous (13, 14). Since its original description, the OSAKA questionnaire has been developed by Schotland and Jeffe (15) to describe the knowledge, attitudes and a needs assessment for developing OSA-related educational initiatives for cardiologists, paediatricians and primary care practitioners (16-18). Wang et al. (19) were the first to explicitly examine and focus on the knowledge and attitudes of anaesthetists. The aim of this national survey was to explore OSA knowledge and attitudes in a sample of Italian anaesthetists and assess the need for the national educational-alerting initiatives focusing on the physiopathology of OSA to improve patients' safety in the perioperative period.

Methods

The Obstructive Sleep Apnoea Knowledge and Attitude (OSAKA) questionnaire is a self-administered paper-and-pencil 23-item questionnaire that takes less than 10 minutes to be completed. The first section is regarding OSA knowledge, with eighteen statements covering five domains: (1) epidemiology, (2) pathophysiology, (3) symptoms, (4) diagnosis, and (5) treatments (See appendix 1). Knowledge items are presented in a true-or-false format; as in Schotland and Jeffe (15) original paper, the 'do not know' choice was also included as a third-response to minimise the effect of guessing and is scored as an incorrect response during response rate calculations, while a score of 'true' (correct) is 1 and the other choice (wrong) is scored 0. The second section concerns OSA attitude and comprises five items: two items assessing the importance of this condition as a clinical disorder and the importance of identifying OSA patients before anaesthesia and three items to evaluate the anaesthetists' self-confidence in the management of OSA patients during the perioperative period (with reference to treatment options, including postoperative CPAP - *Continuous Positive Airway Pressure*). The response to attitude questions was measured on a five-point Likert scale, ranging from 1 to 5 (1=strongly disagree; 2=disagree; 3=neither agree nor disagree; 4=agree; and 5=strongly agree).

Demographic data were also collected, including age, gender, professional title (Staff Anaesthesiologist, Professor, Resident), type of hospital (University or Public), and number of years of practice after postgraduation. The OSAKA questionnaire was translated into Italian and distributed in 600 copies to anaesthetists attending the SIAARTI National Congress (Naples, October 2012) and various editions of the Airway Courses and Hands-on Workshops in the period from October 2012 to June 2013. Participants were asked for consent to provide their data and to participate the survey. All completed questionnaires were mailed to a data collection centre (Department of Anaesthesia, 'GB Morgagni-L. Pierantoni', Forlì, Italy) for statistical analysis. No financial incentive was offered for completing the survey to either interviewees or researchers. The study was approved by the SIAARTI Board of Directors (Prot. n. 505 SIAARTI 2009/2012), thus it didn't require further Ethical committee approval.

Statistical analysis

Data are presented using descriptive statistics. The Kolmogorov-Smirnov test was used to test for normality distribution of the knowledge and attitude score. As the questionnaire scores did not have normal distribution, a Wilcoxon-Mann-Whitney U test was used to assess significant differences in knowledge and attitude total scores between the anaesthetist gender, age, professional title and number of years in practice. Rank analysis of covariance (ANCOVA) was also applied to verify eventual significant difference in attitude score and anaesthesiologists' characteristics. The correlation between knowledge

score and attitude score was calculated using the Spearman correlation coefficient. All p values were two-tailed, and p values below 0.05 were considered statistically significant. Statistical analyses were performed using the statistical Analysis Software (SAS) 9.3 (SAS Institute, Carry, NC, USA).
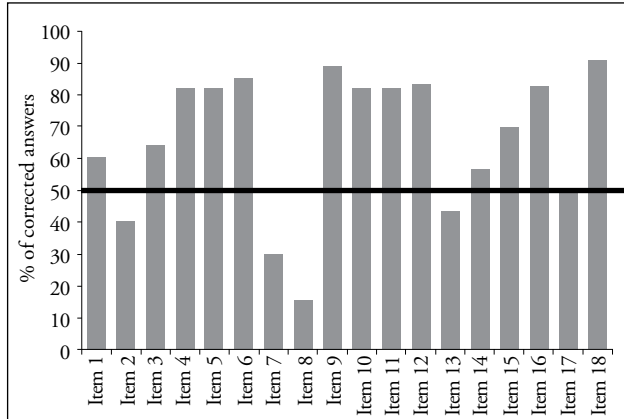

Figure 1. Percentage of corrected answers among the knowledge items (epidemiology, pathophysiology, symptoms; diagnosis; and treatment)

Table 1. Main characteristics of the anaesthetists who completed the OSAKA questionnaire

	Value	Number of cases with available data
Age (years)	45.1±10.1	366 (98.9)
Gender		370 (100)
Female	195 (52.7)	
Male	175 (47.3)	
Professional title		370 (100)
Resident	30 (8.1)	
Staff anaesthetist	324 (87.6)	
Professor	16 (4.3)	
Number of years in practice	15.6±10.4	369 (99.7)

Data are mean±SD or number (%)
SD: standard deviation

Results

The study sample consisted of 370 anaesthetists who completed and returned the questionnaires, with a response rate for this study of 62% (370/600).

Demographic data, professional title and number of years in practice are shown in Table 1.

All descriptive statistics on aggregated knowledge items are reported in Table 2.

Overall, the median (interquartile range [IQR]) knowledge score was 12 (10-14), with a range from 1 to 17. No difference was found on total knowledge score by gender, age, professional title or number of years of practice (Table 3). The knowledge items achieved a mean corrected response rate of 66%±0.14%; there was no single questionnaire completely correct for the knowledge section over 370, and only 15.7% of the anaesthetists knew that laser-assisted uvuloplasty (LAUP) is a surgical specific treatment for OSA (item 8); moreover, only 30.3% of them seemed to know that CPAP may cause nasal congestion (item 7). A percentage of correct answer lower than 50% was also registered for item 2 ('uvulopalatoplasty is curative for majority of OSAs cases', 40,5% correct) and item 13 ('untreated OSAS is within first causes of motor vehicle accidents', 43,5% correct; Figure 1). With regard to attitude items, the median (IQR) total score was 15 (13-17), range 0-20. Female anaesthetists had a higher median attitude score when compared with male anaesthetists, while Anaesthesia residents showed a lower attitude score compared to other professional titles; moreover, anaesthetists with a number of years in practice >15 seemed to reach a higher attitude score (Table 3). Statistically significant difference, also confirmed considering relative differences for IQRs, was reached despite small differences probably because of small sample size. The study was conceived as a pure survey of knowledge and attitudes, and the difference between groups considered as a secondary endpoint; hence, the power analysis (in lack of precise values to be adopted) was not performed. We considered a response rate >50% to accept data as reliable (response rate=62%).

Table 2. Summary of OSA knowledge domains

	n	Mean	SD	Median	IQR	Range
The total score of the 18-item knowledge question	370	11.8	2.5	12.0	10-14	1-17
The knowledge score about epidemiology of OSA	370	0.6	0.3	0.7	0.3-0.7	0-1
The knowledge score about pathophysiology of OSA	370	0.8	0.2	1.0	0.7-1.0	0-1
The knowledge score about symptoms of OSA	370	0.8	0.3	0.7	0.7-1.0	0-1
The knowledge score about diagnosis of OSA	370	0.7	0.2	0.8	0.6-0.8	0-1
The knowledge score about treatments of OSA	370	0.4	0.2	0.5	0.3-0.5	0-1

SD: standard deviation; IQR: interquartile range; OSA: Obstructive Sleep Apnoea

Table 3. Knowledge and attitude score among anaesthetists' characteristics

	Knowledge score			Attitude score		
	Mean±SD	Median (IQR)	p	Mean±SD	Median (IQR)	p
Age (years)						
<45	11.8±2.4	12 (11–14)	0.9381	13.9±4.1	15 (12–17)	0.0905
≥45	11.7±2.7	12 (10–14)		14.7±3.4	15 (13–17)	
Gender						
Female	12.0±2.5	12 (11–14)	0.1140	15.1±2.9	16 (14–17)	0.0003
Male	11.6±2.5	12 (10–14)		13.5±4.3	15 (12–16)	
Professional title						
Resident	11.9±2.8	12 (11–14)	0.4859	12.9±3.2	13.5 (10–16)	0.0104
Staff anaesthetist	11.9±2.4	12 (10–14)		14.4±3.6	15 (13–17)	
Professor	10.8±4.1	11 (9–14)		13.8±6.4	16.5 (9–19)	
Number of years in practice						
<15	11.7±2.3	12 (10–14)	0.4731	13.8±4.1	15 (12–17)	0.0217
≥15	11.9±2.8	12 (10–14)		14.8±3.3	15 (13–17)	

SD: standard deviation; IQR; interquartile rangeApnoea

Table 4. Percentage distribution of OSA attitude items

	Not important	Somewhat important	Important	Very important	Extremely important
Item 19	3.5%	5.9%	29.2%	41.9%	19.5%
Item 20	2.7%	4.4%	15.8%	40.2%	36.9%
	Strongly disagree	**Disagree**	**Neither agree nor disagree**	**Agree**	**Strongly agree**
Item 21	4.6%	12.0%	6.6%	66.1%	10.7%
Item 22	5.4%	8.2%	5.5%	65.4%	15.5%
Item 23	1.1%	7.6%	3.5%	42.9%	44.9%

OSA: Obstructive Sleep Apnoea

The ANCOVA rank confirmed that gender and professional title were statistically associated with the attitude score (F=14.6, p=0.0002 for gender; F=4.72, p=0.0099 for professional title), whereas a weak evidence of association was observed within the number of years in practice and the attitude score (F=2.6, p=0.0519). Regarding the OSA attitude items (item 19, 20, 21, 22, 23), we noticed good results in the performance of Italian anaesthetists' attitude (Table 4).

The knowledge score correlated positively with the attitude score (r=0.4, p<0.0001).

Considering the different knowledge domains, there was a positive correlation between pathophysiology (mid-grade correlation: r=0.3, p<0.0001), symptoms (low-grade correlation: r=0.2, p<0.0001) and diagnosis (mid-grade correlation: r=0.3, p<0.0001) domains and the attitude score. Conversely, a correlation close to zero was observed for epidemiology and treatment domains (r=0.09, p=0.06; r=−0.01, p=0.78).

Discussion

Anaesthetists in the national OSAKA survey seem to show some deficits in knowledge about OSA. To our knowledge, this is the first survey to explore the knowledge and attitudes regarding OSA among anaesthetists in Italy and Europe. Overall, the positive correlation between knowledge and attitude scores suggests that physicians with a better understanding of OSA-related problems are more confident in selecting the safest method for its management. Consequently, initiatives aiming to improve risk awareness and knowledge of OSA might provide specific corrective options. A simple way could be the introduction of the STOP-BANG questionnaire as a tool to improve risk assessment and to promote OSA

awareness. The ideal field of application of this strategy could be within the Operating Room Checklist, for preoperative airway evaluation (20).

SIAARTI 'Difficult Airway Management Task Force' implemented the national recommendations published in 2005, and other papers already identified OSA as a strong predictive factor in airway risk, suggesting that preoperative evaluation should consider OSA-related risks (21-23). The relation between attitude and professional title could be explained by a greater number of opportunities to deal with OSA patients during daily practice and a higher opportunity of attending dedicated courses, workshops and postgraduate updates for hospital doctors rather than for university doctors. The lower attitude score observed in residents may be due to lack of experience, but moreover due to the lack of a specific syllabus allocated to sleep disorders within the national training program in 'Anaesthesia, Reanimation and Intensive Care'. In the USA, the teaching time available to sleep disorders was less than 2 h (23), whereas survey national data regarding attention to this item in the teaching programs are scarce. In agreement with Wang (19), the lower median knowledge score regarded the treatment of OSA. Only 15.7% of the anaesthetists knew that OSAs is an indication for LAUP, despite the fact that it is a common office-based procedure; less than 50% knew that uvulopalatopharyngoplasty (UPPP) is an OSA-effective treatment (24). Similarly, 70% of the responding physicians were not aware that CPAP may cause nasal congestion (25); one of the most important factors limiting the adherence to this effective therapy, and the lack of familiarity with this therapy by anaesthetists can represent a barrier to its application in the perioperative period (26). Some interesting contradictions have been found in some data: many physicians reported a high level of confidence with postoperative OSA patients with CPAP in the attitude section (44.8% strongly agree, 42.9% agree), whereas only 30% of them answered correctly to the statements regarding CPAP and nasal congestion. We explained it as a bias died to 'last-minute knowledge', as the questionnaire was administered during National Congress and Airway Courses and Workshops. Moreover, less than 50% were aware of the fact that untreated OSA is a major cause of car accidents (27), indicating a lack of knowledge of the socioeconomic impact of this condition. Italian anaesthetists participating in this survey performed slightly better (66%) when compared to anaesthetists included in the recent Wang et al. (19) (62%) and worse than physicians enrolled in other studies, with average of knowledge responses of 76% in selected physicians for the Schotland and Jeffe (15) 78% for family practitioners (16), 79% for Cardiologists and internists (17), and 67% for paediatricians (18). These results might reflect greater familiarity with OSA due to different post-graduate training programs and an increasing number of publications regarding OSA in different specialties other than anaesthesia (28-30). In any case, one of the most important conclusion that could be drawn out from our study is that despite an acceptable level of knowledge of OSA among Italian anaesthetists (13 out of 18 items in the knowledge section were answered correctly in over 50% of cases), there are still many points which require improvement. The findings of this study must be interpreted in light of its limitations. First, the sample size was small as the estimated population of anaesthetists in Italy is approximately 11,000, but the response rate to the questionnaire was in line with the return rates previously reported for medical surveys. Second, we cannot exclude the influence of the scientific sessions dedicated to OSA on the questionnaire outcome, which could have skewed the results through overestimation of the knowledge and attitudes scores in the sample. Lastly, the results are based on self-report, introducing the possibility of a systematic bias. In conclusion, the results of the SIAARTI OSAKA survey showed that Italian anaesthetists lack of knowledge about OSA physiopathology and its treatment, revealing the need for an update of teaching initiatives in medical schools, residency training programs and national health care policies to increase awareness of this disease and to implement a wide-scale strategy to improve patient safety and associated costs. We cannot conclude regarding the capacity of Italian anaesthetists to manage OSA patients as this is not the objective of the survey, but this is one of the main reasons why in December 2016 the Obesity Task Force for the SIAARTI Airway Management Study Group developed an intersocietary consensus for perioperative and periprocedural airway management and respiratory safety for obese patients, including specific statements and perioperative recommendations for optimal and safe management of OSA patients (31).

Conclusion

The results of our survey demonstrate lack of knowledge about OSA and its treatment among Italian Anaesthetists, revealing the need to update the syllabus of teaching in medical practice, to increase the number of post-graduation courses and workshops on this topic and to improve national health care policies to improve perioperative care through definition of interdisciplinary consensus and good clinical practice guidelines.

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Hasta Onamı: Yazılı hasta onamı bu çalışmaya katılan doktorlardan alınmıştır.

Hakem Değerlendirmesi: Dış bağımsız.

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APPENDIX 1 - OSAKA Questionnaire

Obstructive Sleep Apnea Knowledge and Attitudes (OSAKA)

	T	F	DK	
1	❏	❏	❏	Women with obstructive sleep apnea may present with fatigue alone
2	❏	❏	❏	Uvulopalatopharyngoplasty is curative for the majority of patients with obstructive sleep apnea
3	❏	❏	❏	The estimated prevalence of obstructive sleep apnea is between 2 and 10%
4	❏	❏	❏	The majority of patients with obstructive sleep apnea snore
5	❏	❏	❏	Obstructive sleep apnea is associated with hypertension
6	❏	❏	❏	An overnight sleep study is the gold standard for diagnosing obstructive sleep apnea
7	❏	❏	❏	CPAP (Continuous Positive Airway Pressure) therapy may cause nasal congestion
8	❏	❏	❏	Laser-assisted uvuloplasty is an appropriate treatment for severe obstruvtive sleep apnea
9	❏	❏	❏	The loss of upper airway muscle tone during sleep contributes to obstructive sleep apnea
10	❏	❏	❏	The most common cause of obstructive sleep apnea in children is the presence of large tonsils and adenoids
11	❏	❏	❏	A craniofacial and oropharyngeal examination is useful in the assessment of patients with suspected obstructive sleep apnea
12	❏	❏	❏	Alcohol or bedtime improves obstructive sleep apnea
13	❏	❏	❏	Untreated obstructive sleep apnea is associated with a higher incidence of automobile crashes
14	❏	❏	❏	In men, a collar size 17 inches or greater is associated with obstructive sleep apnea
15	❏	❏	❏	Obstructive sleep apnea is more common in women than in men
16	❏	❏	❏	CPAP is the first line therapy for severe obstructive sleep apnea
17	❏	❏	❏	Less than 5 apneas or hypopneas per hour is normal in adults
18	❏	❏	❏	Cardiac arrythmias may ba associated with untreated obstructive sleep apnea

T: true; F: false; DK: don't know