

# Uyku Apne sendromu ve PAH

Cağlar CUHADAROĞLU

# Epidemiyoloji

- Çocukta

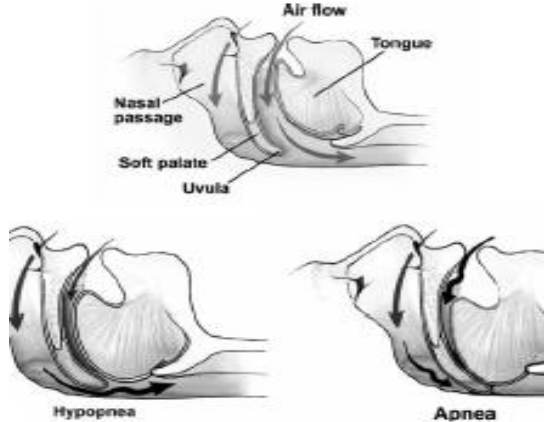
- %2-3 UAHS , %20 Horlama
- 3-6 yaş en sık rastlanan dönem
  - Yumuşak doku nazofarenkse göre hızlı
- Kız erkek eşit

- Erişkinde

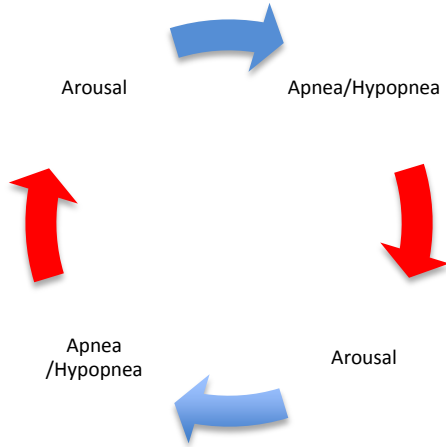
- %2-4 % 18-20 horlama
- 40 yaşüstü erkede daha sık
- İstanbul %3.4  
*Cuhadaroglu, Dörtbudak, Erkan*

## Uyku apne sendromu

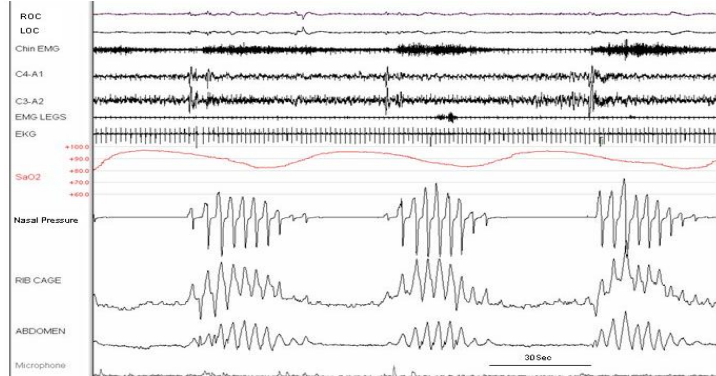
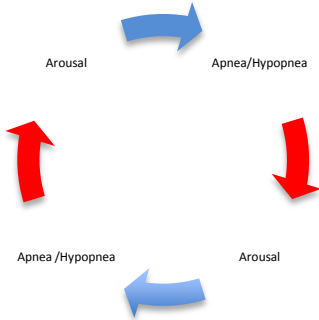
- Tekrarlayan üst hava yolu daralmaları
- Tam tıkanma yada daralma
- Korunma-Arousal
- Bozuk uyku kalitesi
- Asemptomatik



# Apne sırasında ne olur ?



# Apne sırasında ne olur?



700 kez yinelenen hasta var

## Apnea/ Hypopnea

- Hipoksemi
- Hiperkapni
  
- Myokartta hipoksi
- Artmış katekolamin
- Artmış sempatik aktivite
- Oksidatif stres
- Hiperkoagulapati

Arousal

## Arousals

- Re oksijenasyon
- Hipokapni
  
- Artmış katekolamin
- Artmış sempatik aktivite

Apnea/Hypopnea



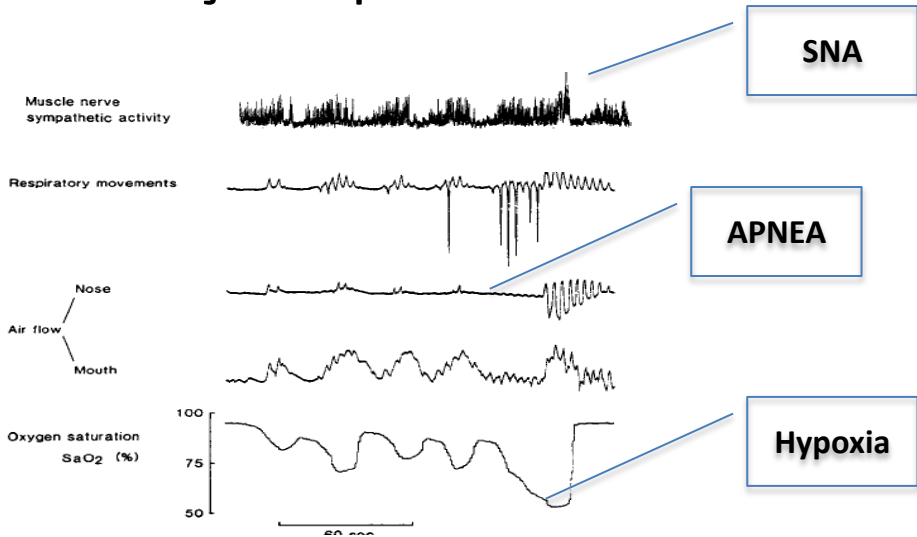
Apnea  
/Hypopnea



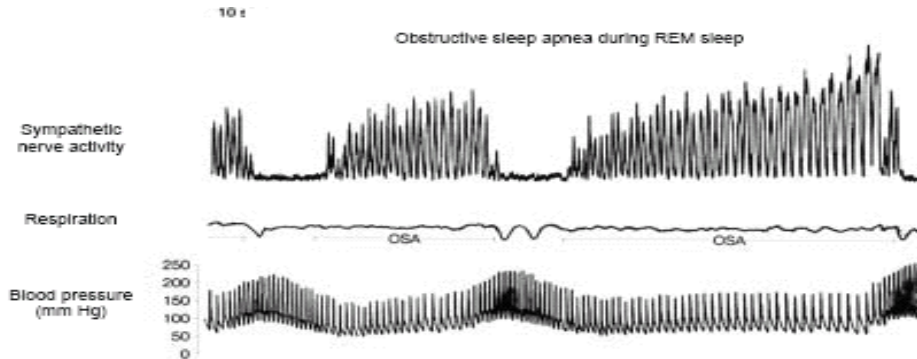
Arousal



# Artmış sempatik aktivite

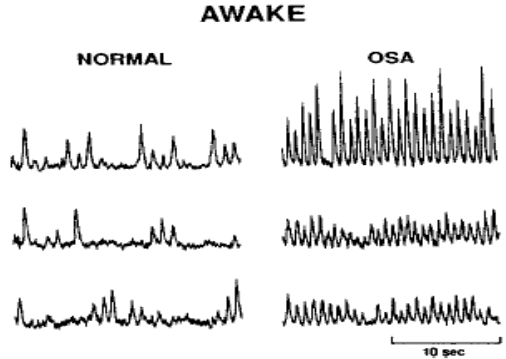
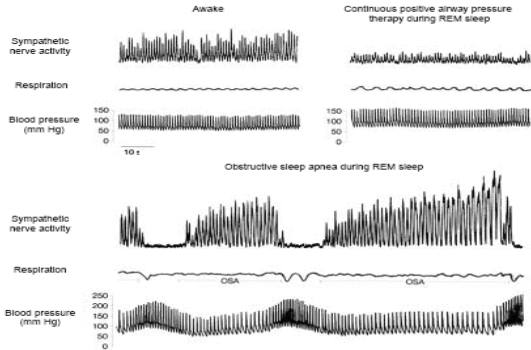


# Apne sırasında ne olur?



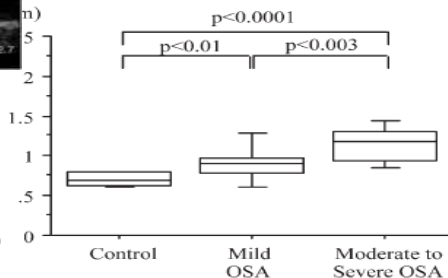
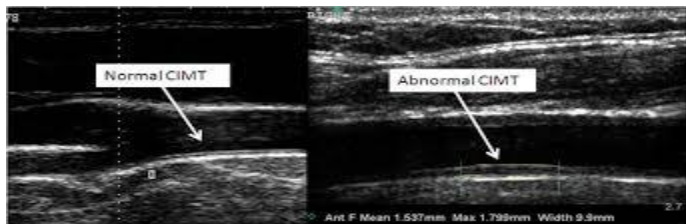


# Apne sırasında ne olur?



# Endotelyal hasar

- Oksidatif stres → Reaktif oksijen radikalleri → inflamasyon

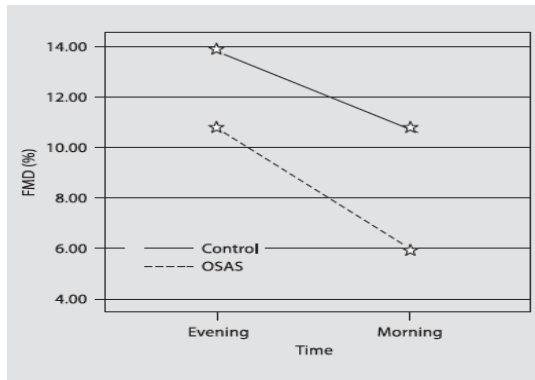


# Endothelial Function in Patients with Obstructive Sleep Apnea Syndrome but without Hypertension

Huseyin Oflaz<sup>a</sup> Caglar Cuhadaroglu<sup>b</sup> Burak Pamukcu<sup>a</sup> Mehmet Meric<sup>a</sup>  
Turhan Ece<sup>b</sup> Erdem Kasikcioglu<sup>c</sup> Nevres Koylan<sup>a</sup>

**Table 2.** Brachial arterial ultrasonography results

Variable	Patient group	Control group	p value
Basal diameter			
Morning	4.16 ± 0.42	3.95 ± 0.48	NS
Evening	4.19 ± 0.48	3.98 ± 0.45	NS
FMD, %			
Morning	6.04 ± 3.18	10.9 ± 2.6	<0.000
Evening	10.38 ± 4.23	13.9 ± 2.32	0.003



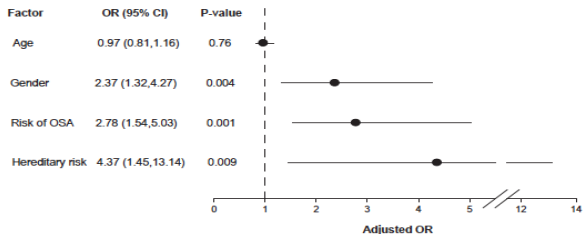
**Fig. 1.** FMD trend in the patient and control groups.

# Hiperkoagulabilite

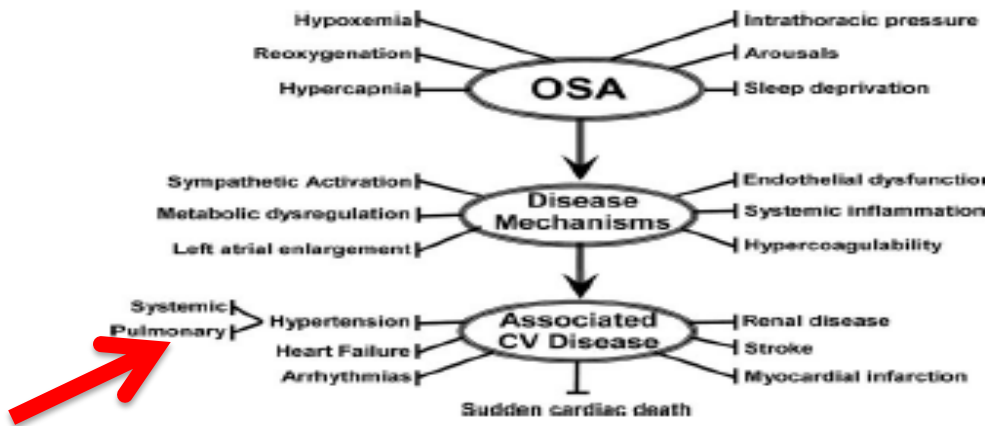
## Snoring and the Risk of Obstructive Sleep Apnea in Patients with Pulmonary Embolism

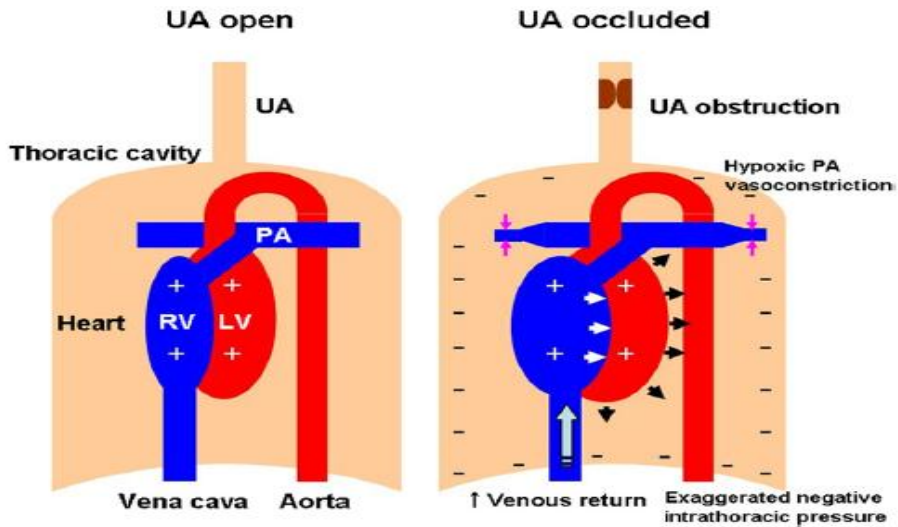
Matthew D. Epstein, MD<sup>1,2\*</sup>; Leopoldo N. Segal, MD<sup>1</sup>; Sherin M. Ibrahim, DO<sup>2</sup>; Neil Friedman, RN, RPSGT<sup>1</sup>; Rami Bustami, PhD<sup>3</sup>

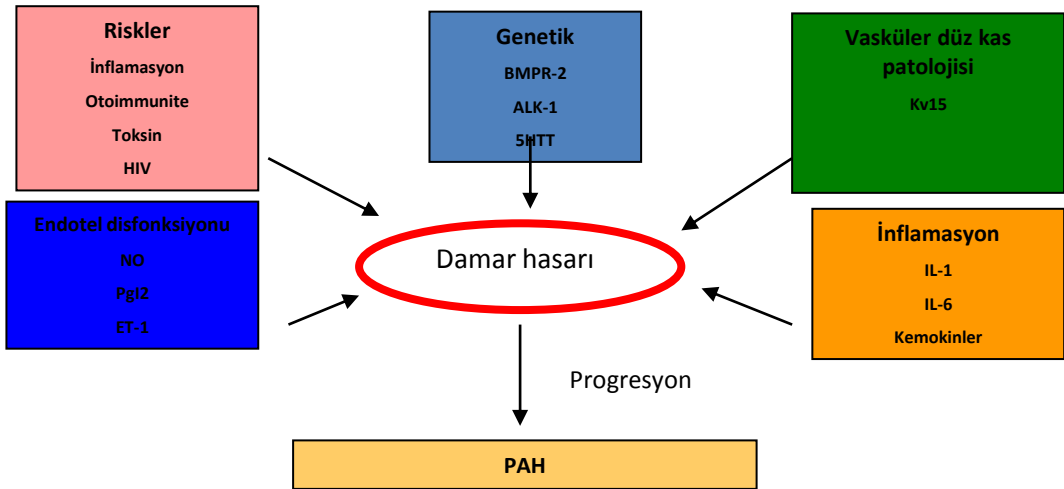
Factor	PE		OR (95%CI)	P-value
	Positive (n = 71)	Negative (n = 199)		
<b>Demographics</b>				
Age, y	60.0 ± 15.7	61.3 ± 17.2	0.96 (0.81,1.12)	0.58
Men	43 (61)	73 (37)	2.65 (1.52,4.62)	0.001
Weight, kg	86.1 ± 23.6	78.0 ± 20.3	1.18 (1.04,1.34)	0.008
BMI, kg/m <sup>2</sup>	28.7 ± 7.0	27.9 ± 6.7	1.02 (0.98, 1.06)	0.38
<b>Clinical Characteristics</b>				
PE risk factors				
Hereditary <sup>a</sup>	10 (14)	6 (3)	5.27 (1.84, 15.10)	0.002
Acquired <sup>b</sup>	53 (75)	128 (64)	1.63 (0.89, 3.00)	0.11
Hypertension	31 (44)	106 (53)	0.68 (0.39, 1.17)	0.17
CHF	4 (6)	30 (15)	0.34 (0.11, 0.99)	0.048
MI	4 (6)	19 (10)	0.57 (0.19, 1.72)	0.32
Smoking	13 (18)	39 (20)	0.92 (0.46, 1.84)	0.81
Pacemaker/central line	10 (14)	16 (8)	1.88 (0.81, 4.35)	0.14
IBD	2 (3)	3 (2)	1.89 (0.31, 11.57)	0.49
Nephrotic syndrome	0 (0)	3 (2)	N/A	1.00
<b>Snoring and risk of OSA</b>				
Snoring	53 (75)	100 (50)	2.91 (1.60, 5.33)	0.001
Risk of OSA	46 (65)	72 (36)	3.25 (1.84, 5.72)	< 0.001

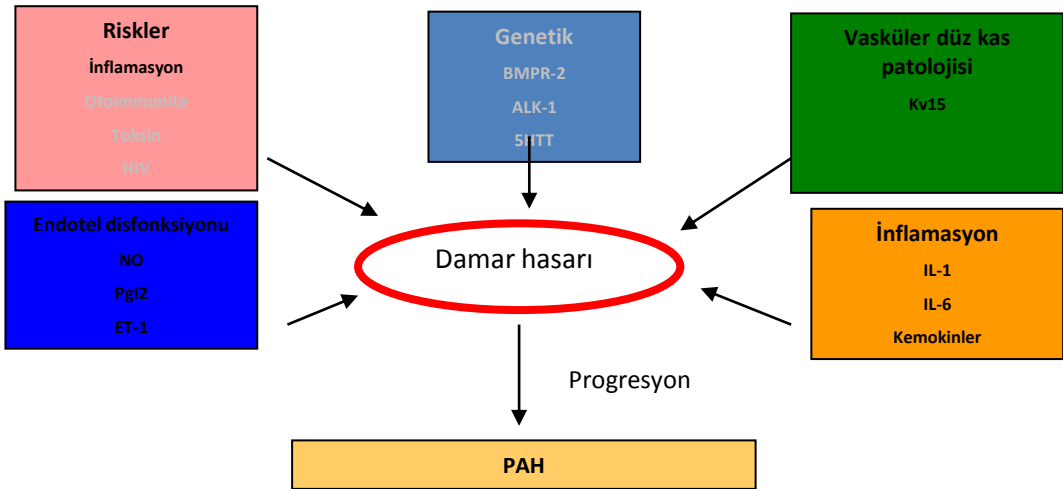


**Figure 2**—Multivariate logistic regression model for pulmonary embolism (N = 270). Model includes groups of individual risk factors. OR refers to odds ratio; CI, confidence interval; OSA, obstructive sleep apnea.



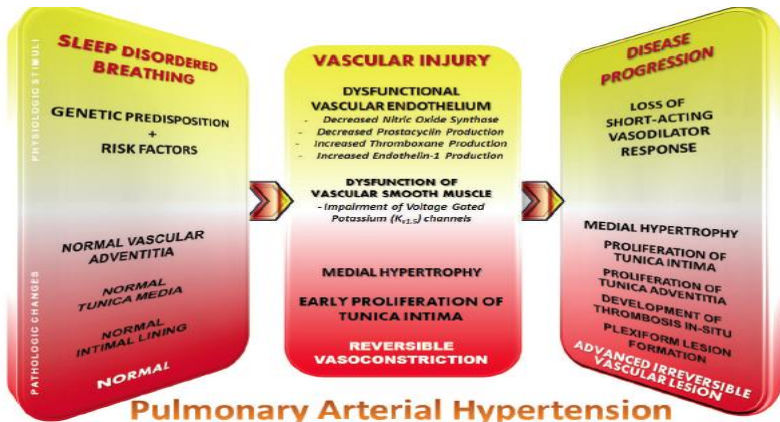






# OSAS





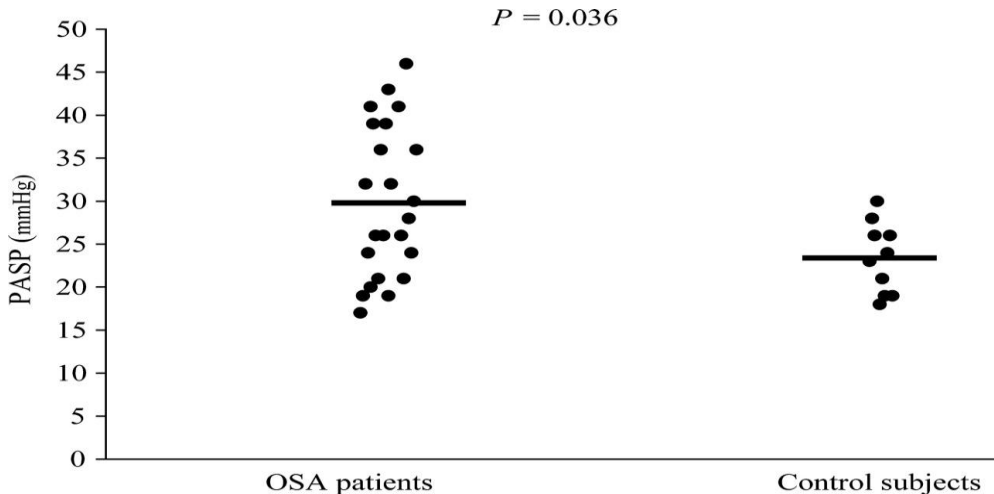
# OSAS ve PAH

- OSAS lıların 16% - 42% da PAH var.
- Bu olguların özellikleri
  - Şişmanlık
  - Bozuk solunum fonksiyonu
  - Hipoksemi derinliği ve süresi
  - Hiperkapni
  - Yaş, cins ve OSAS ağırlığı ile ilintili değil
- Ortalama PAP altta başka bir kalp yada solunumhastalığı yoksa hafif fazla

# Pulmoner Hipertansiyon

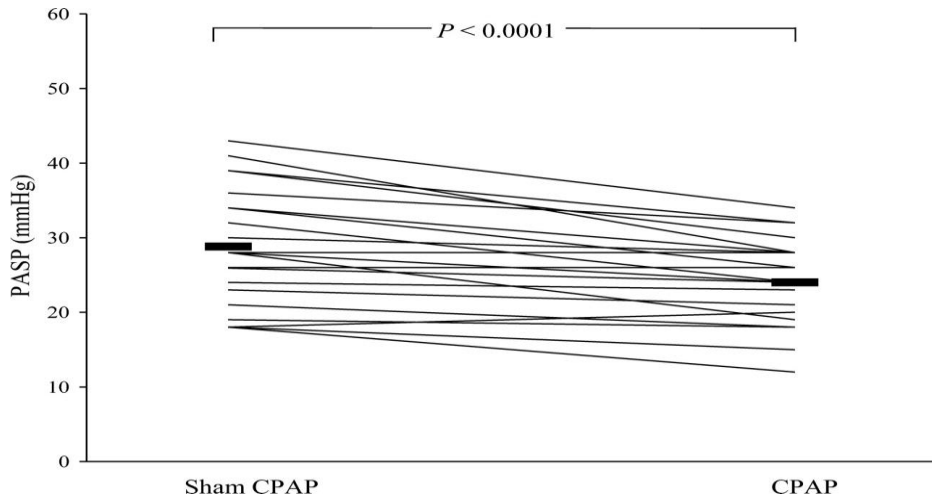
- Randomize
- 23 sadece OSAS sorunu olan olgu
- 10 Kontrol olgusu
- TTE ile pulmoner arter basıncı ölçülmüş.

Individual values for the PASP in OSA patients and control subjects.



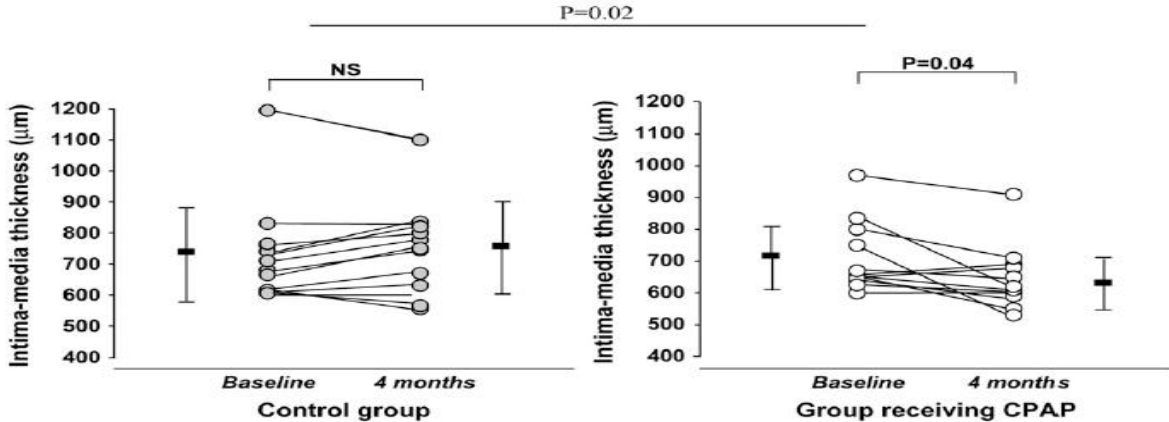
Arias M A et al. Eur Heart J 2006;27:1106-1113

Individual values for the PASP after both sham and effective CPAP treatment in OSA patients.

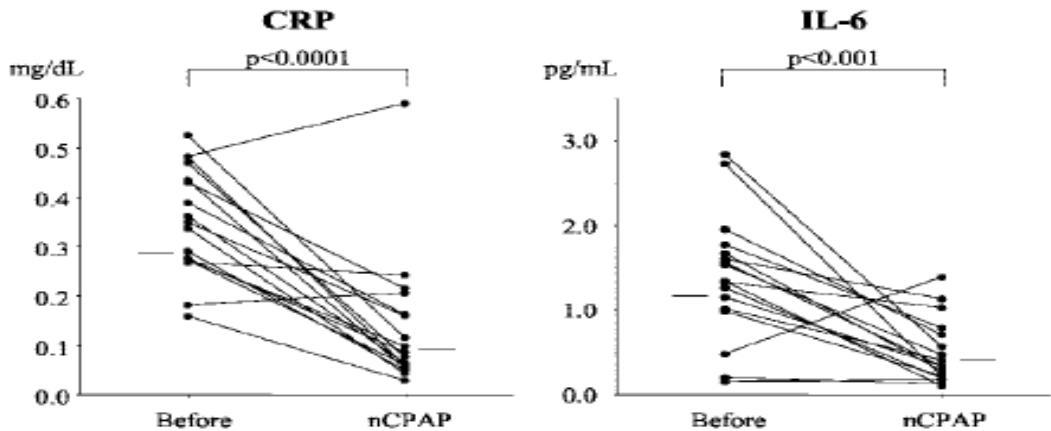


Arias M A et al. Eur Heart J 2006;27:1106-1113

# CPAP kullanımı ve CIMT



# CPAP ve inflamasyon



## Pulmonary hypertension in obstructive sleep apnea hypopnea syndrome

Abou Shehata ME <sup>a</sup>, Mohamed E. El-Desoky <sup>a</sup>, Abd El-Razek Maaty <sup>b</sup>,  
Amina M. Abd-ElMaksoud <sup>a</sup>, Lucy A. Suliman <sup>a,\*</sup>

**Table 1** Comparison between severe OSA patients VS non severe OSA patients according to age, sex, anthropometric measurements, Epworth scale and Berlin questionnaire, PFT and awake ABGs.

	Non-severe OSA (AHI < 30) (n = 16)	Severe (AHI ≥ 30) (n = 38)	P value
Age	46.13 ± 6.98	46.34 ± 6.56	0.914
Sex			
Male	7 (43.8%)	22 (57.9%)	0.341
Female	9 (56.3%)	16 (42.1%)	
BMI	26.81 ± 2.07	31.74 ± 3.28	< 0.001
Neck_cm	38.81 ± 2.20	43.47 ± 1.96	< 0.001
Epworth_Scale	8.25 ± 1.53	13.34 ± 2.21	< 0.001
Berlin questionnaire	2.00 ± 0.00	2.82 ± .39	< 0.001
*AHI	15.75 (9.20–30.0)	70.25 (35.20–132.60)	< 0.001
FEV1	79.22 ± 10.31	79.84 ± 7.63	0.810
FVC	87.86 ± 12.20	86.44 ± 7.71	0.610
FEV1/FVC	90.57 ± 4.44	90.29 ± 5.32	0.857
PaO <sub>2</sub>	86.46 ± 3.86	80.51 ± 6.59	< 0.001
PaCO <sub>2</sub>	37.33 ± 2.84	40.45 ± 6.75	0.082
SaO <sub>2</sub>	96.63 ± 2.18	92.77 ± 3.33	< 0.001

\* AHI = Apnea-hypopnea index, Median (min – max) and Mann-Whitney *U* test was used for data with non-parametric distribution, *P* < 0.05 significant.



## ORIGINAL ARTICLE

## Pulmonary hypertension in obstructive sleep apnea hypopnea syndrome

Abou Shehata ME<sup>a</sup>, Mohamed E. El-Desoky<sup>a</sup>, Abd El-Razek Maaty<sup>b</sup>,  
Amina M. Abd-ElMaksoud<sup>a</sup>, Lucy A. Suliman<sup>a,\*</sup>

**Table 2** Distribution of pulmonary hypertension among the studied OSA patients.

	No	%
OSA with pulmonary hypertension (*mPAP > 25)	24	44.4
OSA without pulmonary hypertension (*mPAP < 25)	30	55.6

\* mPAP = Mean pulmonary artery pressure.

	Non-PH (n = 30)	PH (n = 24)	P value
Age	46.43 ± 7.65	46.08 ± 5.21	0.849
Sex			
Male	16 (53.3%)	13 (54.2%)	0.951
Female	14 (46.7%)	11 (45.8%)	
BMI	28.77 ± 2.71	32.17 ± 4.00	< 0.001
Neck_cm	40.93 ± 2.83	43.54 ± 2.43	0.001
*mPAP	13.5 (10–25)	35 (28–42)	< 0.001
*AHI	33.7 (9.2–107.3)	83.65 (27.9–132.6)	< 0.001
FEV1	80.29 ± 9.73	78.87 ± 6.53	0.543
FVC	87.49 ± 11.35	86.08 ± 5.50	0.579
FEV1/FVC	89.68 ± 5.37	91.25 ± 4.55	0.260
PaO <sub>2</sub>	83.64 ± 5.53	80.55 ± 7.26	0.081
PaCO <sub>2</sub>	38.21 ± 2.87	41.17 ± 8.24	0.072
SaO <sub>2</sub>	94.93 ± 3.05	92.63 ± 3.67	0.015

\* mPAP = Mean pulmonary artery pressure, AHI = Apnea-hypopnea index. Median (min – max) and Mann-Whitney *U* test was used for data with non-parametric distribution, *P* < 0.05 significant.

**Table 6** Comparison between OSA with and without pulmonary hypertension according to parameters of nocturnal O<sub>2</sub> desaturation and AHI.

	Non-PH ( <i>n</i> = 30)	PH ( <i>n</i> = 24)	<i>P</i> value
Basal SaO <sub>2</sub>	91.81 ± 3.29	91.04 ± 2.56	0.353
*ODI	35.50 ± 31.07	65.83 ± 30.06	0.001
Minimum SaO <sub>2</sub>	78.91 ± 8.24	73.35 ± 9.42	0.025

\* ODI = Oxygen desaturation index.

**Table 8** mPAP and PASP before and after 6 months of CPAP treatment.

	N	Pre	Post	<i>P</i> value	Percentage of improvement
mPAP	10	35 (28–40)	26 (20–35)	0.007	26.91 (0–37.14)
PASP	10	45 (40–50)	35 (30–42)	0.005	23.11 (11.11–33.33)

\*PASP = Pulmonary artery systolic pressure, mPAP = Mean pulmonary artery pressure, Median (min – max) and Mann-Whitney *U* test was used for data with non-parametric distribution, *P* < 0.05 significant.

# Kısaca

- OSAS da artmış pulm. Hipertansiyon sık
- OSAS ın yol açtıkları PAH ın nedenleri arasında
- OSAS da kalp ve solunum sorunuda varsa PAH kolay.
- OSAS tedavisi Pulmoner arter basıncını düşürür.

