ISSN- O: 2458 - 868X, ISSN–P: 2458 – 8687
Index Copernicus Value: 49. 23
PubMed - National Library of Medicine - ID: 101731606

International Journal of Medical Science and Innovative Research (IJMSIR)
IJMSIR : A Medical Publication Hub
Available Online at: www.ijmsir.com
Volume – 3, Issue –4, August - 2018, Page No. : 17 - 19

Body mass index as a predictor of obstructive sleep apnea size not predictor of impact

Anusha Rao[1], Ivor d'sa[2], Rajesh V[3], Giridhar B H[4*]

[1]Senior resident – Dept of Cardiology, Narayana hrydayala

[2]Professor – Dept of General Medicine, K S hedge medical academy

[3]Assistant professor - Dept of Pulmonary Medicine, K S hedge medical academy

[4]Associate professor - Dept of Pulmonary Medicine, K S Hedge Medical Academy

Correspondence Author: Giridhar B H**,** Associate professor - Dept of Pulmonary Medicine , K S Hedge Medical Academy

Type of Publication: Original Research Paper

Conflicts of Interest: Nil

Abstract

Obstructive sleep apnea (OSA) is being recognized as an important health issue in the last two to three decades. Despite the advanced diagnostic technology in the field of sleep medicine and increased awareness of OSA in the public, a majority of patients suffering from OSA are still undiagnosed. It is estimated that about 80% of cases are undiagnosed. Recent studies support a correlation between breathing disturbances during sleep and insulin resistant syndrome, independent of the severity of obesity. We studied relation of BMI with OSA, whether BMI can be used to predict OSA. Total of 69 patients with suspected OSA were subjected to overnight polysomnography and their BMI were correlated. Among 69 patients, 43(62.3%) were obese. Eight were morbidly obese (11.6%) and 5 were overweight (7.2%). Only 10 individuals had a normal BMI (14.5%) and 3(4.3%) were under weight. Among them 24 (34.8%) had severe OSA, 21 (30.4%) had moderate OSA and 17 (24.6%) had mild OSA and seven (10%)subjects were having apnea hypopnea index (AHI) in normal range. We found that BMI do not predict OSA.

Introduction: Obstructive sleep apnea (OSA) has being considered as an important health issue in the recent decades.[1] A wide range of medical consequences are linked with obstructive sleep Apnea (OSA). These are global, affecting all the functions in the body. Obesity is one of the main risk factors for obstructive sleep apnea (OSA). The incidence of OSA in the obese population ranges from 40% [10] to 93% [2(11)]. Recent studies support a correlation between breathing disturbances during sleep and insulin resistant syndrome, independent of the severity of obesity.[15] we conducted this study to assess correlation between severity of OSA and body mass index(BMI).

Methodology: Study was conducted in tertiary care teaching hospital in South India. It was a prospective observational study. Patients visiting pulmonary medicine and internal medicine outpatient units who were suspected to have OSA were screened using modified berlin's questionnaire. Study was conducted from January 2015 to June 2016 and a total 69 patients who were screened to have OSA were subjected to overnight polysomnography (Level 1) after obtaining informed consent. Diagnosis and severity assessment of OSA was done based American association of sleep medicine (AASM) guidelines. Patients who were diagnosed to have OSA based on overnight polysomnography were subjected to detailed

anthropometric assessment and BMI was correlated with severity of sleep apnea.

Results: Among 69 patients, 43(62.3%) were obese. Eight were morbidly obese (11.6%) and 5 were overweight (7.2%). Only 10 individuals had a normal BMI (14.5%) and 3(4.3%) were under weight. Among them 24 (34.8%) had severe OSA, 21 (30.4%) had moderate OSA and 17 (24.6%) had mild OSA and seven (10%)subjects were having apnea hypopnea index (AHI) in normal range.

Among 69 Patients, 3 (4.3%) were underweight of which 1 had mild OSA, 1 had moderate OSA and 1 had no OSA (33.3% each). Of 10 patients with normal BMI, 3(14.5%) had mild OSA, 3 had Moderate OSA (30%), 2 had severe OSA (20%) and only 2 patients had no OSA i.e. 20%. Among 5 over weight patients, 1 had mild OSA (20%), 2 had moderate and 2 had severe OSA (40% each).

Among 43 obese patients, 4(9.3%) had no OSA (AHI<5). Majority of them had severe OSA (17 Patients i.e. 39.5%), 8 had mild OSA (18.6%) and 14 had moderate OSA (32.6%). Among 8 morbidly obese patients, 4 had mild OSA (50%), 1 had moderate OSA (12.5%) and 3 had severe OSA (37.5%).None of the patients had AHI<5 among the morbidly obese group. On statistical evaluation, a Positive correlation was found between BMI and OSA. However, it was not significant (Fishers exact test p=.590). {Table 1}

When the area under the ROC curve is observed, it is noted that with the AHI score of 13.05 the result of the test is positive with the sensitivity being 75 % with the specificity of 54% .similarly with the score of 18.55, test is positive with the sensitivity of 60% and the specificity of 54%. Beyond these values the sensitivity and the specificity of the test decreases. This would imply that BMI has a positive correlation at specific values of AHI. Beyond these values there is no correlation found between BMI and severity of Obstructive Sleep Apnoea {Table 2-4}

Discussion: Various studies conducted on relation between OSA and BMI have shown contrasting results. A study conducted by Carlos Martinez-Rivera et al[17], included 192 patients (152 men and 40 women) with suspected OSAS, who underwent a complete Polysomnography study. Their BMI and truncal obesity measurements were obtained. They concluded that obtaining simple measurements such as those for truncal obesity will help prioritize the use of Polysomnography in patients with a greater risk of OSAS. Their results suggested that BMI is not a good predictor of OSAS in a group of patients with a high BMI.

In a study conducted on 44 male patients, Levinson et al.[18] Found no significant relationship between AHI and BMI. Anoher study by O'Keeffe and Patterson [19] using a group of 170 patients with a BMI >35, found no relationship between a diagnosis of OSAS and BMI. Thus, the literature is inconsistent regarding the role of BMI, as a general obesity index, in the diagnosis of OSAS.

When we looked into the BMI as a predictor of OSA, The" p" value obtained is not statistically significant. (p=0.50).Hence it can be concluded that BMI is a not a good predictor of OSA. However, When the area under the ROC curve is observed, it is noted that with the AHI score of 13.05 the result of the test is positive with the sensitivity being 75 % with the specificity of 54%. Similarly with the score of 18.55, test is positive with the sensitivity of 60% and the specificity of 54%. Beyond these values the sensitivity and the specificity of the test decreases. This would imply that BMI has a positive correlation at specific values of AHI. Beyond these values, there is no correlation found between BMI and severity of Obstructive Sleep apnea.

Conclusion : BMI has no linear relation with co-existence of OSA. OSA also occurs in subjects with normal BMI and underweight.

References

1. Indira gurubhagavatula. Consequences of obstructive sleep apnoea. Indian J Med Res 2010;131:188-295.

2. Daltro C, Gregorio PB, Alves E, Abreu M, Bomfim D, Chicourel MH, Araújo L, Cotrim HP. Prevalence and severity of sleep apnea in a group of morbidly obese patients. Obesity surgery. 2007 Jun 1;17(6):809-14.

3.Kwok KL. Obstructive sleep apnoea syndrome and obesity in children. Hong Kong Med J. 2004 Feb;10(1):44-8.

4. Martinez-Rivera C, Abad J, Fiz JA, Rios J, Morera J. Usefulness of truncal obesity indices as predictive factors for obstructive sleep apnea syndrome. Obesity. 2008 Jan 1;16(1):113-8

5. Levinson PD, McGarvey ST, Carlisle CC, Eveloff SE, Herbert PN, Millman RP. Adiposity and cardiovascular risk factors in men with obstructive sleep apnea. CHEST Journal. 1993 May 1;103(5):1336-42.

6. O'keeffe T, Patterson EJ. Evidence supporting routine polysomnography before bariatric surgery. Obesity surgery. 2004 Jan 1;14(1):23-6

Tables.

Table 1: Correlation Of body mass index (BMI) with apnea hypopnea index (AHI).

		APN_HYPOP_INDEX				
		Normal	Mild	Moderate	severe	Total
BMI	Under weight	1	1	1	0	3
		33.3%	33.3%	33.3%	.0%	100.0%
		14.3%	5.9%	4.8%	.0%	4.3%
	Normal	2	3	3	2	10
		20.0%	30.0%	30.0%	20.0%	100.0%
		28.6%	17.6%	14.3%	8.3%	14.5%
	Over weight	0	1	2	2	5
		.0%	20.0%	40.0%	40.0%	100.0%
		.0%	5.9%	9.5%	8.3%	7.2%
	Obese	4	8	14	17	43
		9.3%	18.6%	32.6%	39.5%	100.0%
		57.1%	47.1%	66.7%	70.8%	62.3%
	Morbidly obese	0	4	1	3	8
		.0%	50.0%	12.5%	37.5%	100.0%
		.0%	23.5%	4.8%	12.5%	11.6%
Total		7	17	21	24	69
		10.1%	24.6%	30.4%	34.8%	100.0%
		100.0%	100.0%	100.0%	100.0%	100.0%

Fishers Exact Test P=.590, Ns

Table 2 : Correlation Of BMI With AHI Using Roc Curve

	Frequency	Percent
Over weight and above	56	81.2
Normal	13	18.8
Total	69	100.0

Table 3. ROC Curve Showing Sensitivity And Specificity Of BMI In Relation With AHI.

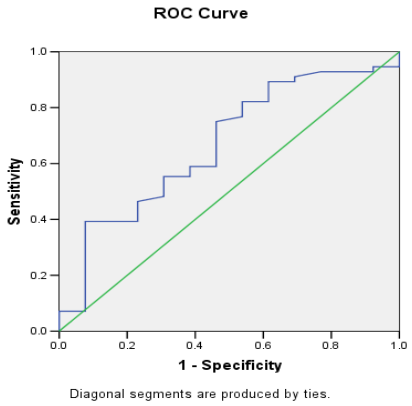

Table 4: Coordinates of The Curve

Test Result Variable(s): AHI

Area	Std. Error(a)	Asymptotic Sig.(b)	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
.667	.083	.062	.504	.830