Original Article

Clinical Characteristics and Complications of Obstructive Sleep Apnea in Srinagarind Hospital

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Objective: To study clinical presentations and complications of OSA in Thai patients.

Materials and Methods: The present study was a retrospective, descriptive study conducted at OSA clinic, Srinagarind Hospital, Khon Kaen University, Khon Kaen, Thailand. The inclusion criteria were adult patients diagnosed as OSA. The diagnosis of OSA was made by evidence of apnea-hypopnea index of 5 times/hour or more by either in-laboratory or portable home sleep test. Clinical presentations and complications of OSA were studied by chart review.

Results: There were 130 patients met the study criteria. The median age and body mass index of all patients were 50 years and 29.5 kg/m^2. The male: female ratio was 1.1: 1.0. Snoring was the most common symptom (63.8%) followed by excessive daytime sleepiness (41.5%). The median AHI and lowest oxygen saturation were 19 times/hour and 83.5%. The top three complications were hypertension (80.8%), left ventricular hypertrophy (38.3%), and gastroesophageal reflux disease or GERD (36.9%).

Conclusion: Clinical presentations of OSA in Thai patients may not be obvious as previously reported. Hypertension, left ventricular hypertrophy, and GERD may be suggestive complications of OSA.

Keywords: Hypertension, Left ventricular hypertrophy, Gastroesophageal reflux disease

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Obstructive Sleep Apnea (OSA) is the important healthcare problem and highly prevalent among patients with established cardiovascular disease. Approximately 5 to 20% of adults have at least mild OSA and 7% have moderate-severe OSA[1-3]. In the United States, the prevalence of the OSA has estimated 15 to 20 million adults. Men have twice prevalence than women[1,4]. The epidemiology data also show the high prevalence in Asian nations. Study in Asia Pacific countries showed the prevalence of OSA range from 3.4 to 4.5% in men and 1.9 to 3.2%[5-8]. In Thailand, the prevalence of OSA was somewhat higher than the previous studies from Asia: 5.3 to 11.4% in men and 3.5 to 15.4% in women[9,10].

OSA is a novel disease and related to several diseases. The 2016 European Guidelines on cardiovascular disease prevention stated that OSA was related to five major cardiovascular diseases including hypertension, heart failure, coronary artery disease, stroke, and atrial fibrillation[11]. These recommendations were made by evidence mostly from the Western studies. In Thailand, there is limited data on association between OSA and various diseases. This study aimed to evaluate the complications of OSA in Thai population. Additionally, characteristics of OSA in Thai patients which may be different from the Western countries were studied.

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Materials and Methods

The present study was a retrospective, descriptive study conducted at OSA clinic, Srinagarind Hospital, Khon Kaen University, Khon Kaen, Thailand. The inclusion criteria were adult patients diagnosed as OSA. The diagnosis of OSA was made by evidence of apnea-hypopnea index of 5 times/hour or more by either in-laboratory or portable home sleep test.

Charts of eligible patients were reviewed to extract

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the following data: baseline characteristics, OSA symptoms, physical signs related to OSA, polysomnography results, and OSA complications. Note that left ventricular hypertrophy in this study defined by echocardiography. Descriptive statistics were used to demonstrate results of both numerical and categorical variables. All data analysis was performed using STATA software (StataCorp LP, College Station, Texas, USA).

Results

There were 130 patients met the study criteria. The median age and body mass index of all patients were 50 years (1st to 3rd quartile range 35.0 to 64.5) and 29.5 kg/m^2 (1st to 3rd quartile range 24.9 to 35.6). The male: female ratio was 53.1: 46.9 (1.1: 1.0). Snoring was the most common symptom (63.8%) followed by excessive daytime sleepiness (41.5%) as shown in Table 1.

Regarding physical signs, 40% of patients had Mallampati classification of 3 and 4. Macroglossia was the second most common physical sign (33.1%). The median neck circumference was 40 cm (Table 2). The median AHI and lowest oxygen saturation were 19 times/hour (1st to 3rd quartile range 10 to 39) and 83.5% (1st to 3rd quartile range 71 to 90). The top three complications were hypertension (80.8%), left ventricular hypertrophy (38.3%), and gastro-esophageal reflux disease (36.9%).

Table 1. Baseline characteristics of obstructive sleep apnea patients diagnosed at Srinagarind Hospital, Khon Kaen University, Thailand (n = 130)

Factors	Values
Age, years*	50 (35.0 to 64.5)
Male sex	69 (53.1)
Body mass index, kg/m^2*	29.5 (24.9 to 35.6)
Previous alcohol drinking	20 (15.4)
Current alcohol drinking	12 (9.2)
Previous smoking	13 (10.0)
Current smoking	4 (3.1)
Allergic rhinitis	29 (22.3)
Snoring	83 (63.8)
Median years of snoring	9 (3 to 19)
Excessive daytime sleepiness	54 (41.5)
Witnessed apnea	42 (32.3)
Unrefreshed sleep	42 (32.3)
Morning headache	31 (23.8)
Nocturia, times/night*	2 (1 to 3)

Data presented as number (percentage)
* Indicated median (1st to 3rd quartile range)

Table 2. Physical signs of obstructive sleep apnea patients diagnosed at Srinagarind Hospital, Khon Kaen University, Thailand (n = 130)

Factors	Values
Mallampati classification	
1	4 (3.1)
2	30 (23.1)
3	39 (30.0)
4	14 (10.0)
Macroglossia	43 (33.1)
Torus palatinus	10 (7.7)
Torus mandibularis	8 (6.2)
Tonsilar enlargement	10 (7.7)
Tonsillectomy	1 (0.8)
Retrognathia	8 (6.2)
Neck circumference, cm*	40 (37.0 to 45.5)
Denture	3 (2.3)

Data presented as number (percentage)
* Indicated median (1st to 3rd quartile range)

Discussion

Several studies found that OSA is prevalent in various diseases including hypertension (50 to 80%), stroke (70 to 80%), coronary artery disease (50%), atrial fibrillation (50 to 80%), and heart failure (50%)[11]. The results of this study showed a reverse side of OSA and other diseases. Among 130 OSA patients, at least 80.8% of patients had at least one associated conditions. Hypertension was the most common associated disease at our hospital. This finding may explain by OSA clinic of our hospital is embedded in the hypertension clinic resulting in high prevalence of left ventricular hypertrophy as well. However, one study found that OSA is an independent risk factor for left ventricular hypertrophy regardless of hypertension with adjusted odds ratio of 3.579 (95% confidence interval, 1.589 to 8.058)[12]. Left ventricular hypertrophy can be found up to 78% of patients with moderate to severe OSA[12]. The present study found lower rate of left ventricular hypertrophy (38.3%) which may be explained from less severe OSA patients in the present study (AHI of 19 times/hour). One interesting finding is that 36.9% of OSA patients had GERD (Table 3). This rate was somewhat higher than a report from Korea showed that OSA patients had GERD 22.7% due to a different method of GERD diagnosis[13]. In the present study, we used GERD diagnosis from the medical record, while the Korean study diagnosed GERD by a gastroscopy. These findings remind physicians to be aware of OSA in patients with left ventricular hypertrophy or GERD.

Regarding clinical manifestations of OSA, the 2017 American Academy of Sleep Medicine recommends daytime sleepiness plus any two features of habitual loud snoring, witnessed apnea/gasping/choking during sleep and hypertension as high risk for moderate or severe OSA[14]. However, we found that these three factors are not sensitive in the present study population. Only 63.8% of patients reported snoring, while daytime somnolence or witnessed apnea found in only 32.3% to 41.5% (Table 1). Unlike a previous report from Canada, snoring was found in 80 to 90% with a ratio of witnessed apnea of 52%[15]. These findings implied that clinical symptoms of OSA in our population

Table 3. Complications of obstructive sleep apnea patients diagnosed at Srinagarind Hospital, Khon Kaen University, Thailand (n = 130)

Complications	Number (percentage)
Hypertension	105 (80.8)
Left ventricular hypertrophy*	36 (38.3)
Gastroesophageal reflex disease	48 (36.9)
Diabetes mellitus	36 (27.7)
Stroke	10 (7.7)
Coronary artery disease	9 (6.9)
Heart failure	8 (6.2)
Other arrhythmias	5 (3.8)
Atrial fibrillation	1 (0.8)

Data presented as number (percentage)
* by echocardiography

may not be obvious. Clinical awareness of OSA is recommended in Thai patients. Note that a low rate of snoring may be due to advanced age of our study population. The median age was 50 years at which snoring may not be reported. In contrast, these older age groups may present with insomnia instead of snoring. As previously reported, insomnia is found in 30% of OSA particularly in female patients[16]. Note that history of snoring may be as long as 19 years prior to OSA diagnosis. Finally, the authors would like to recommend body mass index of over 25 kg/m^2 to be a risk factor for OSA as previously reported[17].

There are some limitations in the present study. First, this study evaluated only clinical presentations and complications of OSA. Other aspects were not studied such as CPAP therapy or quality of life[18-20]. And, some OSA patients were treated at a hypertension clinic. Therefore, the features may represent mostly OSA associated with hypertension. Other associated diseases or conditions such as coronary artery disease or stroke may have been under-evaluated[21,22].

In conclusion, clinical presentations of OSA in Thai patients may not be obvious as previously reported. Hypertension, left ventricular hypertrophy, and GERD may be suggestive complications of OSA.

What is already known on this topic?

Obstructive sleep apnea patients may present with snoring, daytime sleepiness, or witnessed apnea during sleep. The common cardiovascular complications of OSA include hypertension, coronary artery disease, atrial fibrillation, stroke, or heart failure.

What this study adds?

Clinical presentations of OSA in Thai patients may be different from the Western countries. Snoring or witnessed apnea may be reported in only 63.8% and 32.3%, respectively. Hypertension, left ventricular hypertrophy, and GERD may be leading complications of OSA in Thai population.

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Potential conflicts of interest

The authors declare no conflict of interest.

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ลักษณะทางคลินิกและภาวะแทรกซ้อนของโรคหยุดหายใจขณะหลับจากการอุดกั้นในโรงพยาบาลศรีนครินทร์

ธนชัย แสนลัง, กิตติศักดิ์ สวรรยาวิสุทธิ์, ทรงขวัญ ศิลารักษ์, ไพบูรณ์ จัตกุล, ปณิตา ลิมปะวัฒนะ, จารินญ์ จินดาประเสริฐ, วีรจิตต์ โชติมงคล, วิชัย เส้นทอง, กรรณิการ์ คงบุญเกียรติ, อัคราณี ทิมินกุล, ฉลองชัย พิษณุวงษ์, บัณฑิต สวรรยาวิสุทธิ์, สิทธิชัย คำใสย์

วัตถุประสงค์: เพื่อศึกษาอาการแสดงทางคลินิกและภาวะแทรกซ้อนของโรคหยุดหายใจขณะหลับจากการอุดกั้นในผู้ป่วยชาวไทย

วัสดุและวิธีการ: การศึกษานี้เป็นการศึกษาย้อนหลังเชิงพรรณาโดยทำการศึกษาที่คลินิกโรคหยุดหายใจขณะหลับจากการอุดกั้น โรงพยาบาลศรีนครินทร์ มหาวิทยาลัยขอนแก่น อำเภอเมือง จังหวัดขอนแก่น ประเทศไทย เกณฑ์คัดเข้าการศึกษา ได้แก่ ผู้ป่วยผู้ใหญ่ที่ได้รับการวินิจฉัยว่าเป็นโรคหยุดหายใจขณะหลับจากการอุดกั้น ซึ่งได้รับการวินิจฉัยโดยมีอัตราการหยุดหายใจมากกว่าหรือเท่ากับ 5 ครั้งต่อชั่วโมงโดยการตรวจการนอนในห้องปฏิบัติการหรือการตรวจที่บ้าน อาการแสดงทางคลินิกและภาวะแทรกซ้อนของโรคหยุดหายใจขณะหลับ จากการอุดกั้นถูกทำการศึกษาจากเวชระเบียน

ผลการศึกษา: มีผู้ป่วยจำนวน 130 รายที่เข้าเกณฑ์การศึกษา ค่ามัธยฐานของอายุและดัชนีมวลกายของผู้ป่วยทุกรายคือ 50 ปีและ 29.5 กก. ต่อตารางเมตร อัตราส่วนของเพศชายต่อเพศหญิงคือ 1.1: 1.0 อาการนอนกรนเป็นอาการที่พบบ่อยที่สุด (ร้อยละ 63.8) ตามด้วยอาการง่วงนอนระหว่างวัน (ร้อยละ 41.5) ค่ามัธยฐาน ของอัตราการหยุดหายใจและค่าออกซิเจนในเลือดที่ต่ำที่สุดคือ 19 ครั้งต่อชั่วโมงและร้อยละ 83.5 ภาวะแทรกซ้อน 3 ลำดับแรกได้แก่ ความดันโลหิตสูง (ร้อยละ 80.8) หัวใจห้องล่างซ้ายโต (ร้อยละ 38.3) และโรคกรดไหลย้อน (ร้อยละ 36.9)

สรุป: อาการแสดงทางคลินิกของโรคหยุดหายใจขณะหลับจากการอุดกั้นในผู้ป่วยชาวไทยอาจไม่ชัดเจนเช่นดังรายงานในอดีต โรคความดันโลหิตสูง หัวใจห้องล่างซ้ายโต และโรคกรดไหลย้อนเป็นภาวะแทรกซ้อนที่อาจบ่งถึงโรคหยุดหายใจขณะหลับจากการอุดกั้นในผู้ป่วยชาวไทย