

WOODBINE•STEELES

SLEEPCLINIC

活柏睡眠測試診所

Research and Presentation

Sleep Medicine

Effects of Weight (BMI) and Sleep Position on Severity of OSA in Chinese and non-Chinese patients

R. Ng., T. Chow., J. Fang., M. Hawke.



Presented on June 11th, 2012 at the SLEEP 2012; the 26th Annual Meeting of the Associated Professional Sleep Societies, LLC (APSS)

The Associated Professional Sleep Society, LLC (APSS) is a joint venture of the American Academy of Sleep Medicine and the Sleep Research Society

Introduction: Obstructive sleep apnea (OSA) is a common sleep disorder affecting both men and women in all ethnicities. However, most past and current studies are primarily based on Caucasian populations. Large scale studies with a more in-depth consideration of parameters affecting OSA in other ethnic groups such as Chinese are still lacking. As such, little is known regarding the major role that ethnicity plays in OSA, both as a risk factor in itself, as well as its influence on other risk factors. The main purpose of this study was to establish the prevalence and the effects of body mass index (BMI) and sleep position on obstructive sleep apnea (OSA) severity in the Chinese and non-Chinese ethnicities.

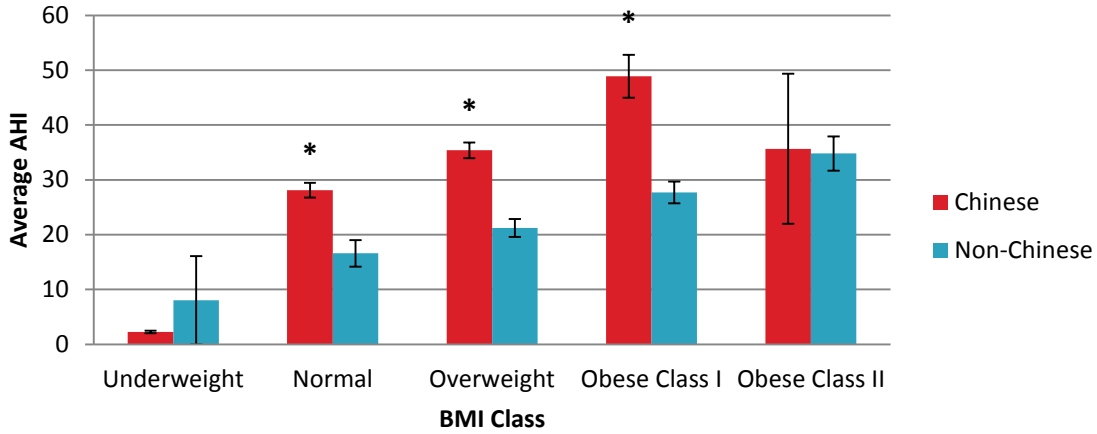
Methods: A large scale, retrospective study analyzing key differences in AHI, and its relationship with BMI, and sleep position amongst Chinese (n=857) and non-Chinese (n=839) ethnic groups was performed. Subgroup analyses after matching for: (1) OSA severity and (2) body mass index and (3) gender and (4) sleep position was analyzed between the two groups.

Results: There is an observed higher prevalence of OSA among Chinese patient population. There is also a consistent positive correlation between weight and severity of OSA (AHI); with increasing weight (BMI) significantly increases the severity of OSA in both Chinese and Non Chinese groups. However, the degree of increase is much more profound in the Chinese group, especially in female. In this study, some Chinese females who were classified as underweight also have some degree of OSA. The proportion of significant OSA in each obesity class is also higher in the Chinese group. The degree of decrease in severity of OSA changing from supine to non supine position is also greater in the Chinese ethnic group.

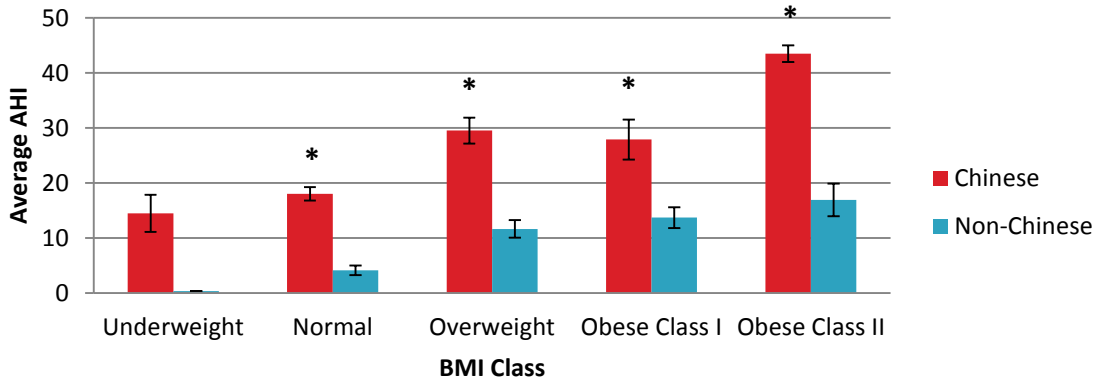
Conclusion: The data from this study confirms that Chinese have higher prevalence of OSA compare to non-Chinese and obesity has a much more profound additive effect on OSA severity in this ethnic group. More stringent or modification of risk assessment criteria for OSA, such as the effect of BMI, in this ethnic group is indicated. Additionally, this study highlights the possibility of other risk factors in addition to obesity; such as narrow upper airway anatomy, that could play a more dominant etiologic role in the pathogenesis of OSA in Chinese.

Comparison of Average AHI (Apnea / Hypopnea Index) and BMI Class between Chinese and non-Chinese Population

Average AHI between ethnicity in each BMI class - Male



Average AHI between ethnicity in each BMI class - Female

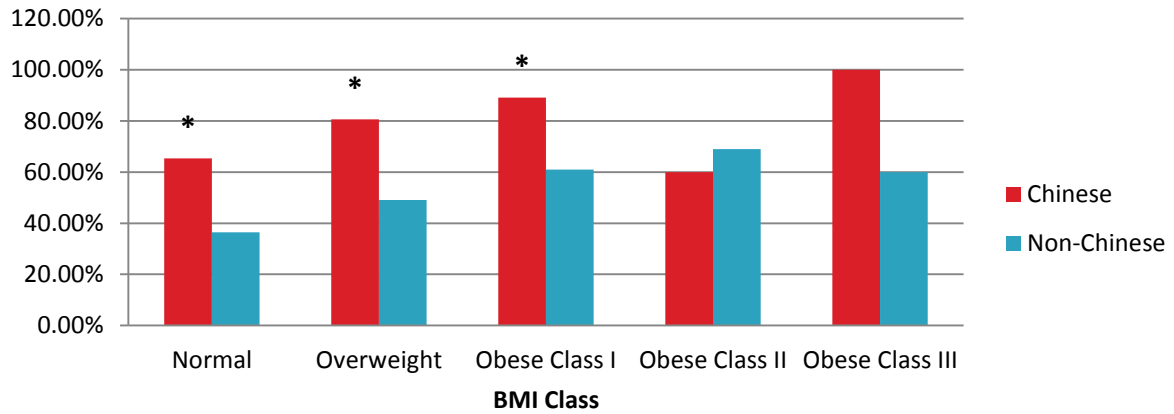


Highlight:

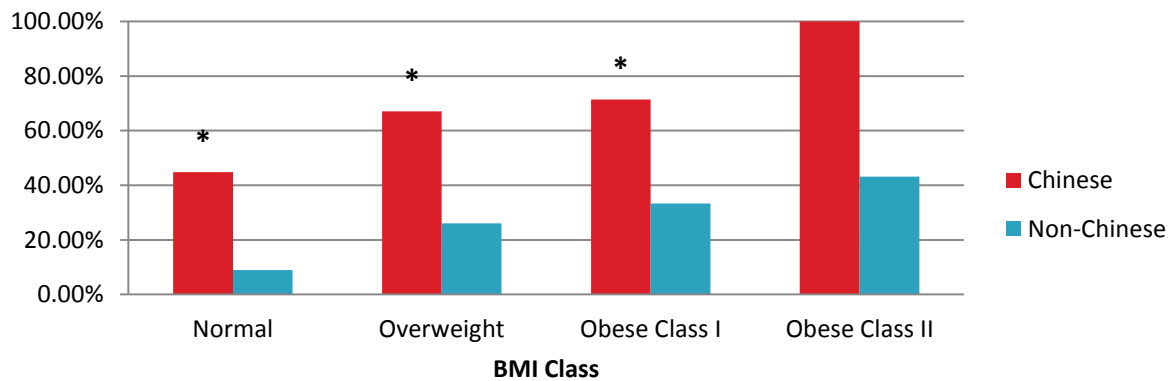
- In normal, overweight and all obesity classes, AHI is significantly higher in Chinese than non-Chinese in both male and female groups, however the differences is much more pronounced in Chinese females
- Most Chinese patients have at least moderate degree of OSA and significantly higher degree of AHI increment is observed with increasing BMI when compared to the Non-Chinese group
- Non-Chinese men begin having moderate OSA at overweight class and majority of Non-Chinese females have mild to mild moderate degree of OSA
- Some Chinese females have some degree of OSA despite being underweight

The Prevalence of Moderate to Severe OSA in each BMI Classification

Proportion of Ethnicity with at least Moderate OSA (AHI > 15) - Male



Proportion of Ethnicity with at least Moderate OSA (AHI > 15) - Female

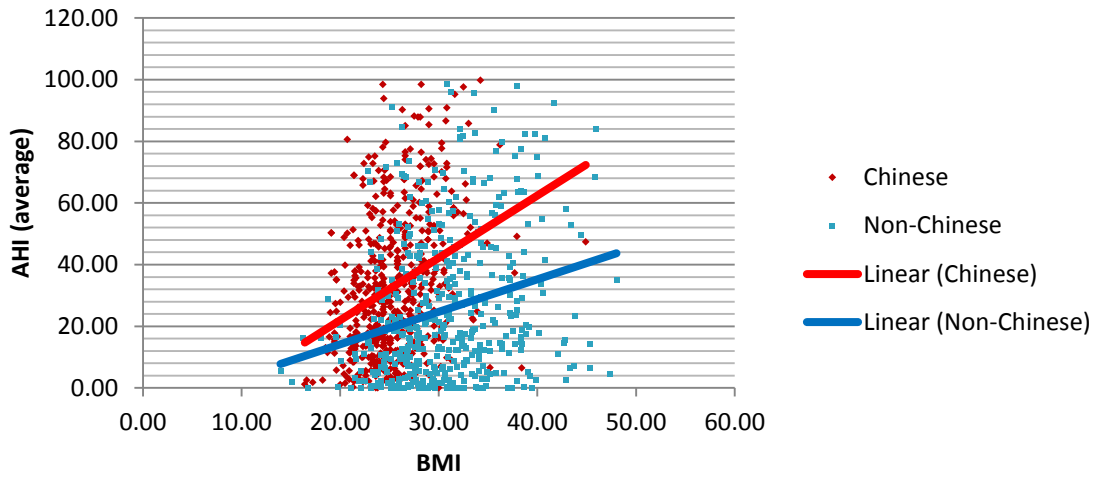


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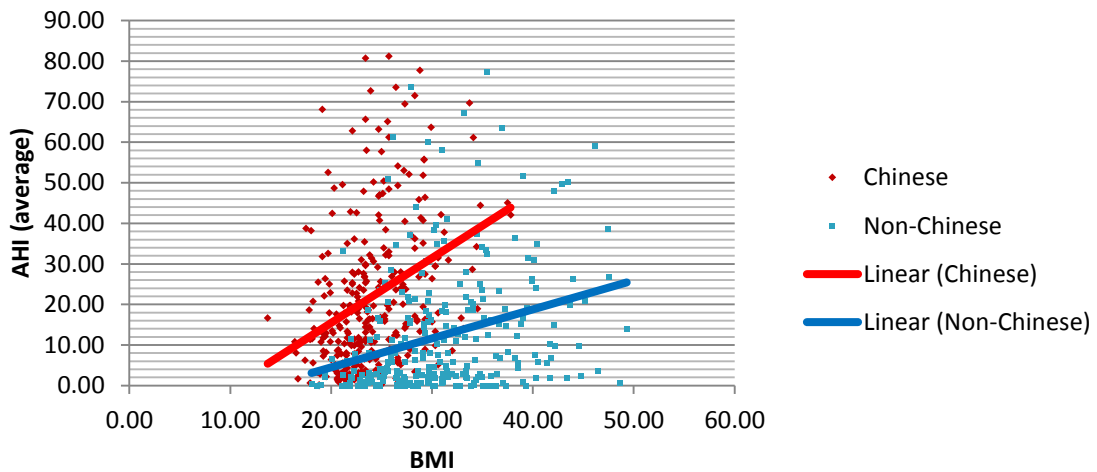
- In each obesity class, a greater proportion of Chinese have at least moderate to severe degree of OSA than non-Chinese

Correlation of OSA and BMI between Ethnicity groups

Comparison of AHI and BMI correlation between ethnicities - Male



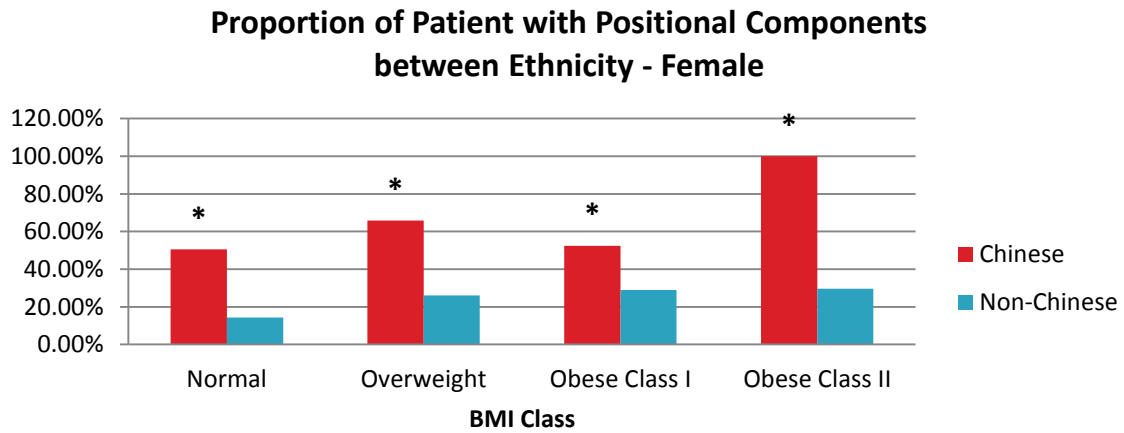
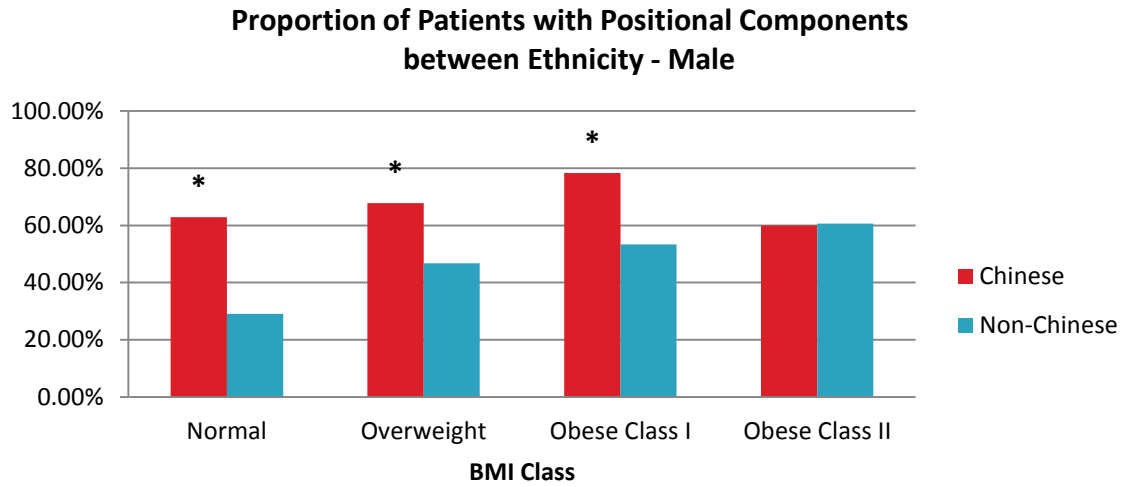
Comparison of AHI and BMI correlation between ethnicities - Female



Highlight:

- BMI is positively correlated with AHI. Regression analysis shows a greater increase in AHI for every increase in BMI in Chinese populations.
Pearson product-moment correlation used to test for significance and linear regression.

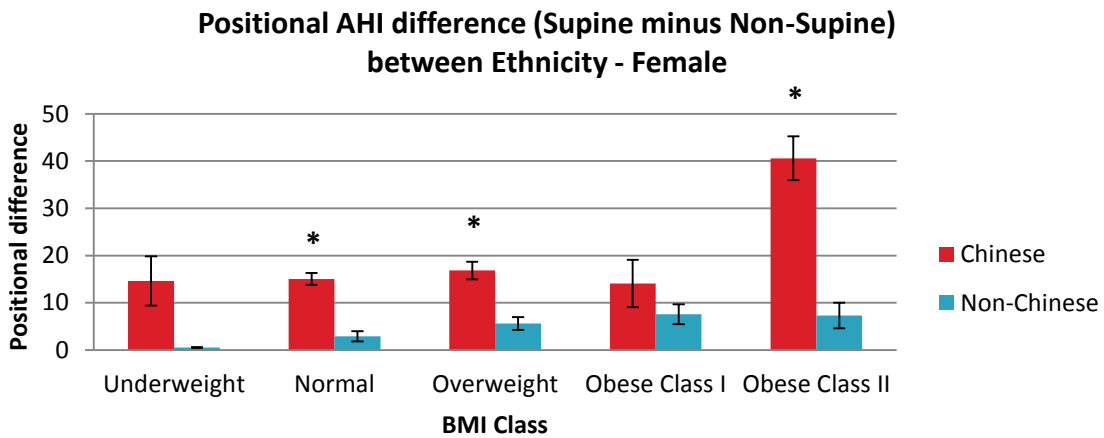
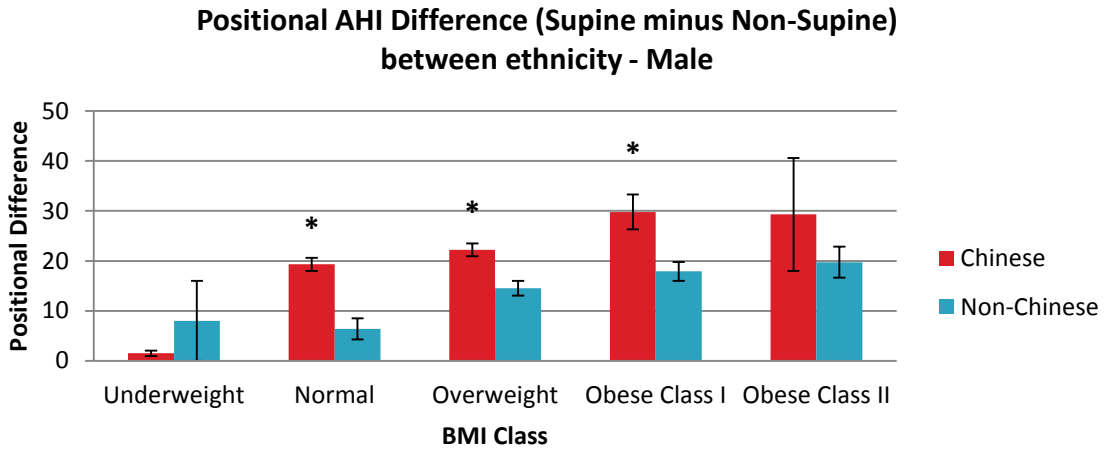
Effect of Supine and Non Supine Position on AHI – Chinese and non Chinese (I)



Highlight:

- A Significantly greater proportion of Chinese patients have Obstructive Sleep Apnea with significant positional component compare with Non-Chinese patients
- Anatomical upper airway obstruction is likely a more significant factor in determining positional dependent OSA in Chinese

Effect of Supine and Non Supine Position on AHI – Chinese and non Chinese (II)



Highlight:

- Chinese patients have a significant greater degree of changes in AHI (severity of OSA) when changing from supine to non-supine position, suggesting that upper airway anatomy has a more significant role in contributing to severity of OSA.
- The effect of positional changes on AHI is much higher in Chinese female patients especially in the obese classes, suggesting that upper airway anatomy has an even greater role in determining the severity of OSA particularly in obese Chinese female.

RESEARCH ABSTRACT

The Relationship between Thyroid Cancer and Sleep Pattern and Obstructive Sleep Apnea

R. Ng., T. Chow., J. Fang.



Presented on June 11th, 2012 at the SLEEP 2012; the 26th Annual Meeting of the Associated Professional Sleep Societies, LLC (APSS)

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Introduction:

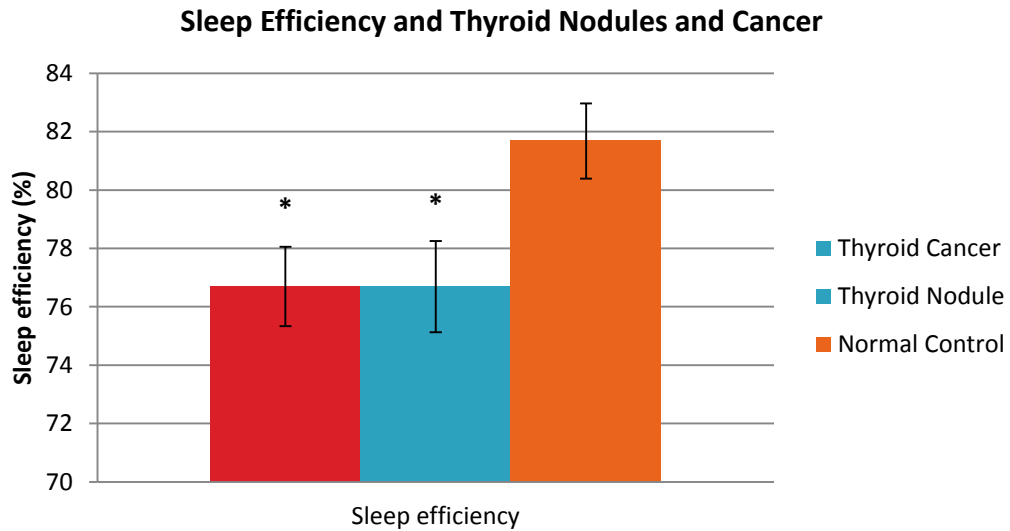
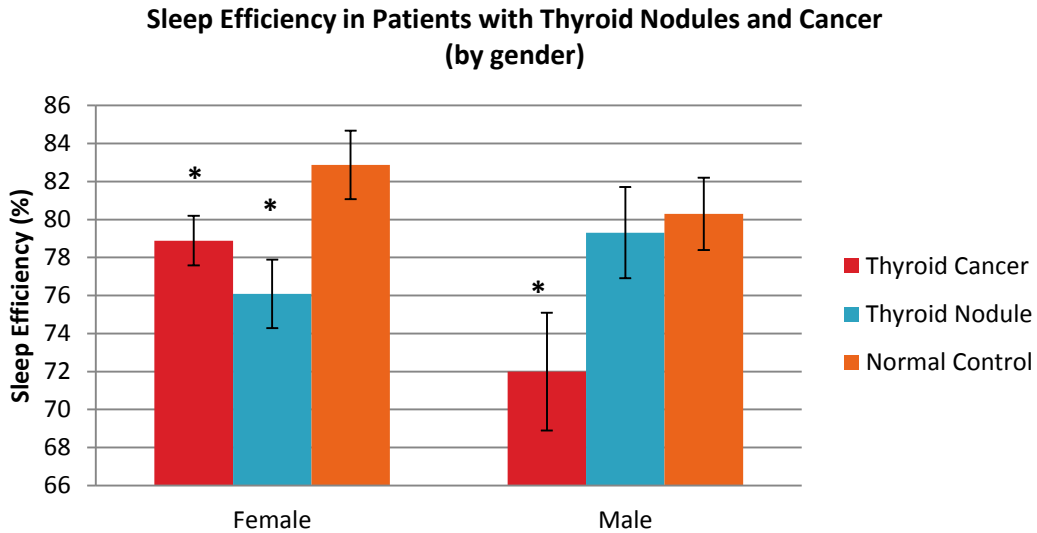
Thyroid nodules and cancer is a common head and neck condition and the incidence of thyroid cancer has increased over 20 folds in the last 10 years while the exact etiology is largely unknown. Excessive stimulation of the thyroid by thyroid stimulating hormone (TSH) could be one of the factors in its pathogenesis. It is known that neuroendocrine secretion can be altered by sleep disorders, and both hypo- and hyperthyroidism has been associated with irregular sleep patterns. The complex relationship between thyroid dysfunction and sleep disturbances warrants further investigation. As such, this study attempt to understand relationship between sleep patterns, especially sleep efficiency, wake after sleep onset levels (WASO), and obstructive sleep apnea (OSA) in normal population and patients with thyroid nodules (benign and cancer).

Methods: A retrospective study analyzing key differences in sleep efficiency, duration of wake after sleep onset (WASO), and severity of obstructive sleep apnea (AHI) were compared in patients with (n=74) and without (n=89) thyroid cancer. Subgroup analyses were performed after matching for gender and weight (BMI).

Results: There is a significant relationship between poor sleep efficiency and the presence of thyroid nodules or cancer; patients having confirmed thyroid cancer have the poorest sleep efficiency among the three studied groups. While this observation exists in both male and female cancer patients, the degree is much more profound in male. Patients with thyroid cancer are also found to have a much longer wake after sleep onset duration (WASO) and similarly, the differences is significantly higher in male patients. On the other hand, patients with thyroid nodules or cancer were found to have less severe degree of OSA (AHI) compared to the normal group, irrespective of their BMI.

Conclusion: Studies primarily looking at the relationship between thyroid nodules and cancer and potential disturbances in sleep patterns are limited. This study showed specific and significant patterns of sleep disturbances (i.e. poor sleep efficiency, prolonged WASO, and lowered AHI) in patients with thyroid nodules (benign and particularly malignant). These findings suggest that there may be a causative relationship between sleep and etiology of thyroid nodules or cancer. For instance, it is possible that prolonged WASO or poor sleep may lead to abnormal sTSH production leading to over stimulated thyroid and formation of nodules or cancer. Persistent elevated sTSH and the subsequent hyperthyroid state could be part of the reasons accountable for the observed lower risk of OSA in these patients.

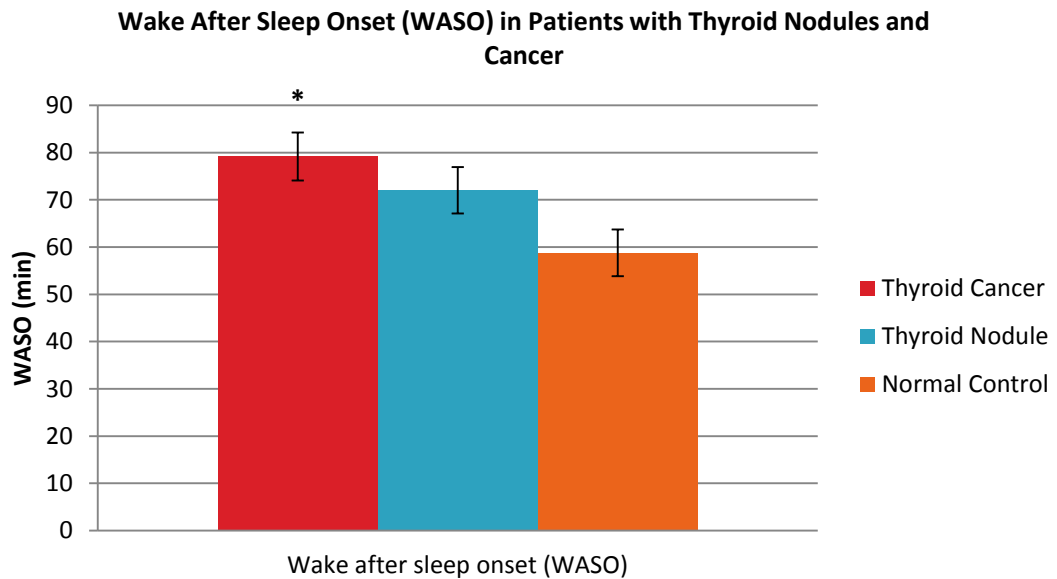
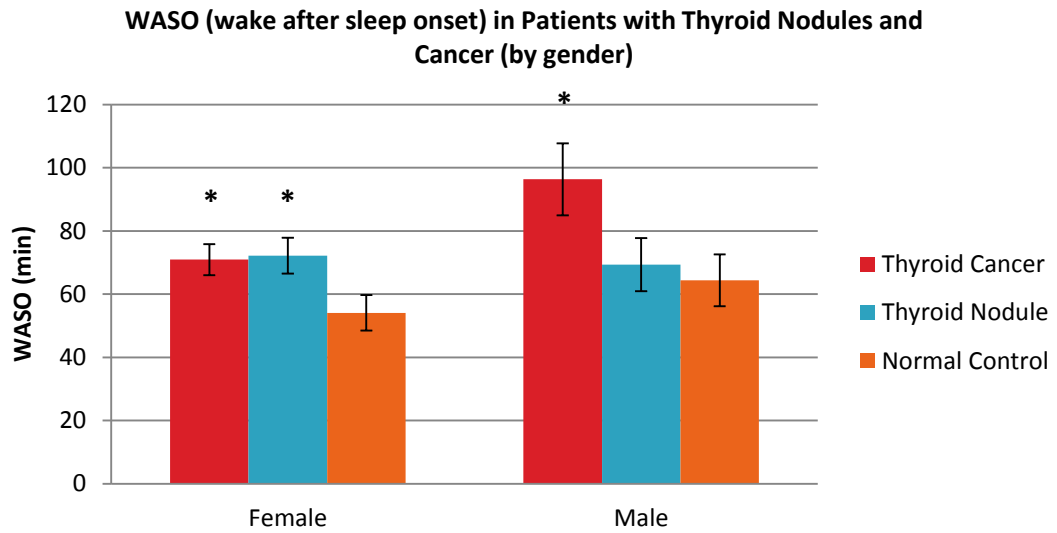
Thyroid Nodules (Benign and Malignant) and Sleep Efficiency:



Highlight:

- A significant ($p < .05$) difference in sleep efficiency in patients with thyroid nodules and cancer compared to healthy control is observed. Females with benign thyroid nodule ($M=78.89\%$, $SE=1.3$) and males with thyroid cancer ($M=71.99\%$, $SE=3.1$) have significantly lower sleep efficiency than healthy controls ($M=82.88\%$, $SE=1.8$). The effect of thyroid pathology on sleep efficiency is more pronounced in males.

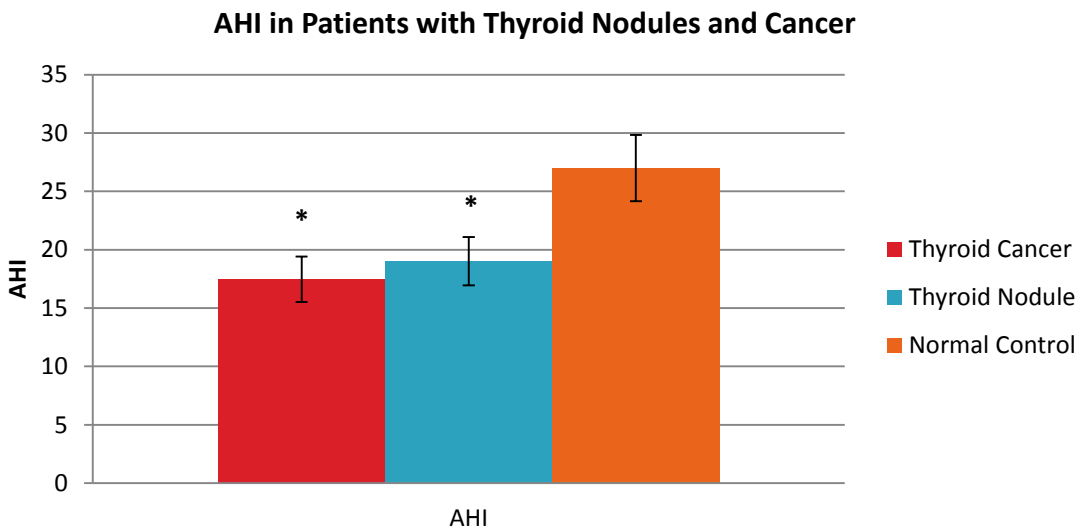
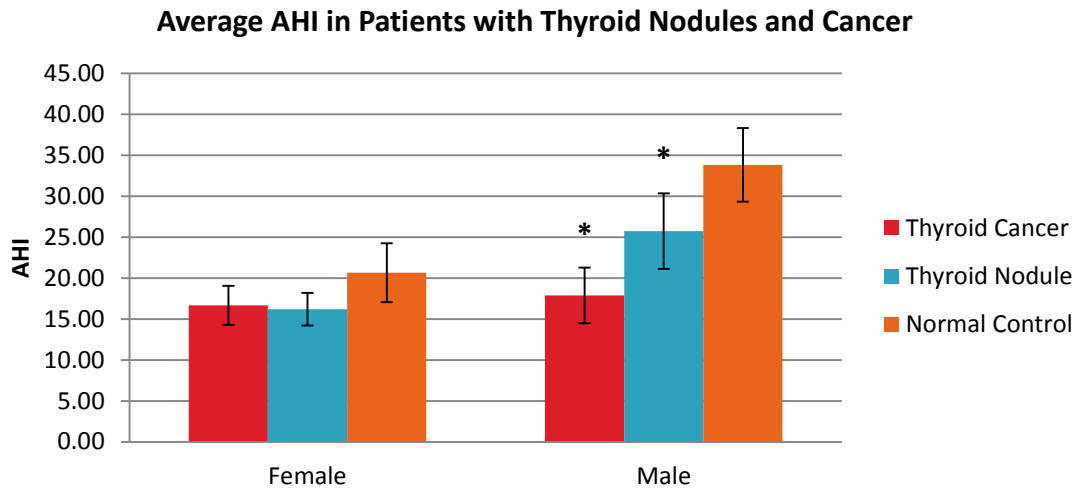
Thyroid Nodules (Benign and Cancer) and WASO (wake after sleep onset)



Highlight:

- A significant ($p < .05$) difference in WASO in patients with thyroid nodules or cancer as compared to healthy control is observed. Females with thyroid cancer ($M=70.94$, $SE=4.91$) or benign nodules ($M=72.13$, $SE=5.68$) have significantly higher WASO levels than healthy controls ($M=54.06$, $SE=5.6$); males with thyroid cancer ($M=96.35$, $SE=11.4$) have significantly higher WASO levels than healthy controls.

Thyroid Nodules (Benign and Cancer) and AHI (Apnea / Hypopnea Index)



Highlight:

- A significant ($p < .05$) difference in AHI among patients with thyroid nodules and cancer as compared to healthy control is observed.
- Males with thyroid cancer ($M=17.87$, $SE=3.4$) have significantly lower AHI than healthy controls ($M=33.81$, $SE=4.5$).