Effectiveness of Oropharyngeal Exercise and Yoga Therapy on Snoring - A Randomized Controlled Trial

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ABSTRACT

Introduction and Aim: Snoring is noisy breathing during sleep. Hoarse (or) harsh sound from nose (or) mouth that occurs when breathing is partially obstructed while sleeping. IT can causes that aren't due to underlying disease.Snoring is a common condition that can affect anyone it occurs more frequently in men and people who are overweight. Snoring has tendency to worsen with age.The main aim of this study is to compare the effectiveness of oropharyngeal exercise and yoga therapy on snoring.

Materials and Methods: Randomized control study in 30 subjects between age group of 36-55 years with snoring has been recruited for the study. The study was done for 3 weeks and the subjects were divided into GROUP A: (n = 15) Oropharyngeal exercise. GROUP B: (n = 15) Yoga therapy.The study type was comparative pre and post-test type.Thornton snoring scale were the outcome measures.

Results: On comparing mean value of Group A and Group B on Thornton snoring scale, it shows significant reduction (***$p \leq 0.001$) in the post test value of Group B. Hence Group B gives more effective than Group B Oropharyngeal exercise.

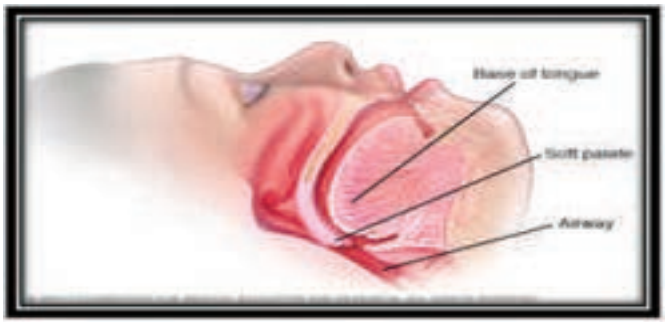
Conclusion: The study concluded the Yoga therapy exercise improves snoring.

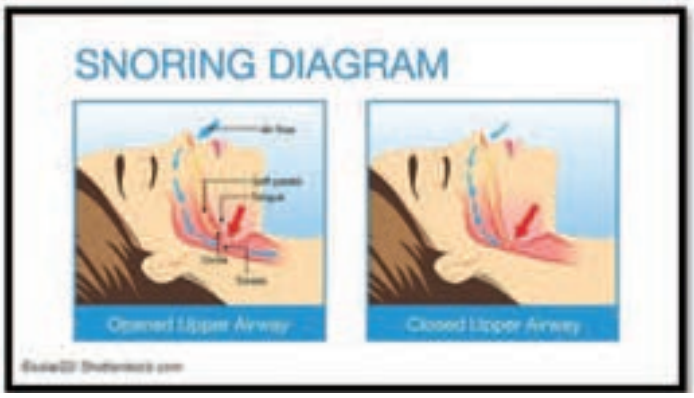
Key Words: Oropharyngeal exercise, Yoga Exercise, Anti-snoring exercise.

INTRODUCTION

Snoring is noisy breathing during sleep. It is a common problem among all ages and both genders, and it affects approximately 90 million American adults- 37 million on a regular basis (1). It is the most common symptom of OSAS (present in up to 95% of all patients (2). IT is also very common in the adult general population, affecting 25-30% of all women and 40-45% of all men on a regular basis (3). Daytime sleepiness and fatigue are also a frequent complaint of obese people. In this regard, Vgontzas *et al* recently reported that obese patients can be sleepier than normal-weight controls during the daytime even if they do not demonstrate any degree of sleep disorder breathing (4). Snoring is a common condition. In a study of nearly 6000 people living in San Marino Lugaresi *et al* stated that 40% of men and 28%of women snored, with increasing prevalence up to the seventh decade, when over 60% of men and 40% of women were found to be habitual snorers (5). In an earlier study we found that snoring occurred in over half of the adult population, with 86%of wives reporting their husbands as snorers and 57% of husbands reporting their wives as snorers (6). Associated with sleep apnoea and other sleep disorder snoring has been a topic of medical discussion for several years and has even been considered a risk factor for sudden death in infants (7). Reports have recently speculated that snoring may be a risk factor for other diseases (8). Lugaresi *et al* has shown that snoring is associated with hypertension (9). Person most at risk are males and those who are overweight, but snoring is a problem of both genders, although it is possible that women do not present with this complaint as frequently as men. Snoring usually becomes more serious as people age. It can cause disruptions to your own sleep and your bed-partner's

sleep. It can lead to fragmented and un-refreshing sleep which translates into poor daytime function (tiredness and sleepiness). The tissues in your throat can relax enough that they partially block your airway and vibrate. Habitual snoring is quite prevalent in the general adult population around the world (10).





Snoring is the earliest and most consistent sign of upper airway dysfunction leading to sleep apnoea/hypopnea syndrome. The American Sleep Disorders Association (ASDA) (11) defined snoring as "Loud upper airways breathing, without apnoea or hypoventilation, caused by vibrations of the pharyngeal tissues. Snoring occurs when air flows past relaxed tissues, such as your tongue, soft palate and airway, as you breathe. The sagging tissues narrow your airway, causing these tissues to vibrate. A number of studies have already addressed the issue of habitual snoring as a risk factor for vascular disorders. Habitual snorers show increased arterial hypertension, cardiovascular disease, or angina pectoris and they appear more atrisk for brain infarction (12).

Mechanism of snoring

The vibration of different parts of the throat produces different types of sound during snoring. When the soft tissue of the nasopharynx is involved, the sound is soft and nasal in quality. Vibration of the soft palate and uvula, in contrast, produces a guttural (harsh-sounding) and loud snore which is characteristically throaty. In most snorers, more than one area is involved in the vibration. Tonsil enlargement can also cause snoring.

Snoring occurs at peak intensity during stage 4 sleep, or deep sleep, which usually occurs 90 minutes after the onset of sleep. The position of the sleeper also influences snoring, with the loudest sounds occurring when the individual is lying in the supine position. The sound occurs during the stage of inspiration. These sleep disturbances were strongly associated with respiratory symptoms, physical disabilities, use of non-prescription medications, depressive and anxiety symptoms, cognitive dysfunction and poorer self-perceived health (13). Sleep produces muscular relaxation which includes that of the throat and airway muscle. This causes constriction of the airways, which increases the velocity of air movement during expiration, and alters the air pressure in the air passages. This in turn causes the sides of the passages to collapse slightly inwards, which promotes soft tissue vibration because of the inrushing air with the next inspiration. Sleep effects on the UA: snoring-sleep relationship several factors influence UA resistance. They decrease with the increase of lung volume and breath rate (14). They increase with head flexion, mucous congestion (15) and, particularly, during sleep. Recently, it was reported that the significant decrease in activity of the tensor palatini muscle, during sleep, demonstrated a good correlation with increased resistance (16). In snoring subjects, there are some anatomical and functional abnormalities, and the intensity and frequency of snoring correlate with these (17).A flow limitation, constant or decreasing flow independent of the driving pressure, during sleep has been reported by several authors in

healthy non-snorers, in healthy snorers, and in OSA patients. In these situations, sleep seems to provoke a flow limitation, (18) with a decrease in the tone of the muscles of the UA. When the airway is partially obstructed, as happens with tonsillar inflammation or colds, the same effect is produced, accounting for the onset of snoring with such conditions. Snoring damages the vascularity of the muscles that are involved, leading to their weakening and further airway narrowing. Snoring will worsen over time unless treated.

MATERIALS AND METHODS

A total number of 30 subject with both female and male between age group of 36-55 years separated by 2 groups. GROUP A: (n = 15) Oropharyngeal exercise. GROUP B:(n = 15) Yoga therapy. Study designed by comparative and pre and post test type and the Study setting is carried at Dr. M.G.R Educational and Research Institute. Thornton snoring scale used as outcome measures.

Inclusion Criteria: Subjects with snoring and apnea, both sexes were included in this study. Tonsil infections. Recurrent acute tonsillitis. Chronic tonsillitis. Acute tonsillitis complications. History of habitual snoring for the past 3 months or longer.

Exclusion Criteria: Subjects with mental retardation, hemorrhagic diathesis, systemic diseases, genetic disorders, acute respiratory infection, peripheral nerve paralysis, neurological diseases, central nervous system diseases were excluded in this study.

Intervention

In this study, 30 subjects were equally divided into 2 groups as follows:Group A = Oropharyngeal exercise (Anti – snoring exercise) Group B = Yoga therapy exercise (KapalbhatiPranayama, Bhujangasana). Six anti-Snoring throat exercises and the following exercises can helpby Repeat each vowel (a-e-i-o-u) out loud for three minutes a few times a day. Place the tip of your tongue behind your top front teeth. Slide your tongue backwards for three minutes a day.Close your mouth and purse your lips. Hold for 30 seconds. With your mouth open, move your jaw to the right and hold for 30 seconds. Repeat on the left side.With your mouth open, contract the muscle at the back of your throat repeatedly for 30 seconds. Tip: Look in the mirror to see the uvula ("the hanging ball") move up and down.

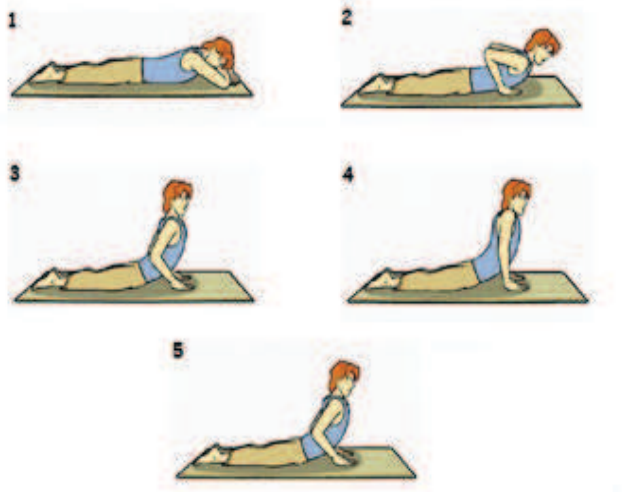
Yoga Therapy Exercise

Steps of KapalbhatiPranayama

First, sit on the Padmasana **a**nd close your eyes and keep the spine straight. Now take a deep breath (inhale deeply) through your both nostrils until your lungs are full with air.Now Exhale through both nostrils forcefully, so your stomach will go deep inside. As you exhale you feel some pressure in your stomach. While the process of exhaling there is a hissing sound, at this point try to think that your disorders are coming out of your nose. Repeat this process for 5 minutes.

BhujangasanaBhujangasana

To start the pose, lie on your stomach and place your forehead on the floor.You can have your feet together, or hip width apart.Keep the tops of your feet pressing against the floor.Place your hands underneath your shoulders, keeping your elbows close to your body. Draw your shoulder blades back and down, and try to maintain this throughout the pose.Draw your pubic bone towards the floor to stabilize your lower back, and press your feet actively onto the floor.With the next inhale, start lifting your head and chest off the floor. Be mindful of opening the chest, and don't place all of your weight onto your hands. Keep the elbows lightly bent and keep the back muscles working. Take your hands off from the floor for a moment to see what a comfortable, maintainable height is for you.Keep your shoulders relaxed.With exhale lower yourself back onto the ground.Take 2-3 rounds of inhaling yourself up into the cobra, and exhaling down to the floor. Then hold for 2-3 full breaths, and come back down. Rest on the floor for a few breaths, or enjoy Child's pose **as a gentle counter pose.**



Statistical Analysis

The statistical analysis collected data were tabulated and analyzed, mean and standard deviation were used to assess all the parameters of the data using Statistical Package of Social Science [SPSS] in that independent t-test was used to compare the pre and post test intervention measures within groups.

Table 1: Comparison of Group A and Group B in Thronton Snoring Scale

THRONTON SNORING SCALE	*GROUP-A		*GROUP-B		t-TEST	SIGNIFICANCE
	MEAN	SD	MEAN	SD		
PRE TEST	11.20	2.45	10.86	1.35	0.46	.649***
POST TEST	8.46	2.09	6.06	1.66	3.46	.000***

Table 2: Comparison of Thronton Snoring Scale between Pre and Post Test in Group A

GROUP-A	PRE TEST		POST TEST		t-TEST	SIGNIFICANCE
	MEAN	SD	MEAN	SD		
THRONTON SCORING SCALE	11.20	2.45	8.46	2.09	11.97	.000***

Table 3: Comparison of Thronton Snoring Scale between Pre and Post Test in Group B

GROUP-B	PRE TEST		POST TEST		t-TEST	SIGNIFICANCE
	MEAN	SD	MEAN	SD		
THRONTON SCORING SCALE	10.86	1.35	6.06	1.66	10.94	.000***

RESULTS

There is a significant difference seen in pre and post test using Thornton snoring scale. By comparing two groups, Group B Yoga therapy is reduced snoring, that gives more effective than the Group A oropharyngeal exercise.This shows that there is statistical difference in Group A & B.

DISCUSSION

The present study compared the effectiveness of Oropharyngeal exercise and Yoga therapy on Snoring - A Randomized trial.The similar earlier studies, yoga-intervention had improved the total sleep quality in elderly living in old age home (20). Effects of yoga on sleep quality and depression in elders in assisted living facilities. In Table 1, it shows significant difference in group A and group B. The mean value of Group B (i.e.) pre test and post is reduced compared to group A which means yoga therapy have more effective mean value than pre test. In table-1 shows statistically highly significant difference in group A and B between pre test and post test (***$p \leq 0.001$). The proportions of habitual snorers that we observed in the CRB, CAR and REF patients (48, 48 and 30%, respectively) were reliable estimates of this hospital set-ting, given the requested presence of the spouse or a household member at the interview.In fact, it is known that self-reporting of sleep habits may yield an underestimation of the prevalence of habitual snorers (21).Habitual snoring prevalence studies have re-ported frequencies of 7.6% , 15.6% and 19%. In Table 2 shows significant Snoring reduced in post test value in Group B (yoga therapy). The pre test is high compared to post test Group B shows significant between pre and post test (***$p \leq 0.001$).Previously Manjunath and Telles have reported that 6 months of yogic program in elderly involving physical postures, relaxation techniques, voluntarily-regulated breathing and lectures on yoga philosophy had improved sleep latency, sleep duration and feeling of being rested in the morning (22). In agreement with the similar earlier studies, yoga-intervention had improved the total sleep quality in elderly living in old age home (23). In Table 3 shows effective reduction in snoring in Group B of post test compared to pre test. Similar to a previous randomized controlled study, this study also demonstrates favourable effects of yoga intervention on QOL. Kishiyama S (2006) (24).Yoga program in elderly was also reported to improve the muscle strength, active range of motion, gait and balance, mobility, physical and emotional well-being (25).

CONCLUSION

The study concludes Yoga therapy also reduces Snoring and Sleep apnea by regular routine of exercises. An important problem in dealing with respiratory sound, such as snoring, is the comparison of the data of various investigators and correct interpretation. This is due to the fact that each group uses different instruments and devices, and their own recording protocols and data analysis. Thus even if well performed, comparison is difficult (19). The result suggested in this that yoga therapy showed greater improvement than oropharyngeal exercise by compared two groups in Thornton snoring scale.

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