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Effects of respiratory exercise on airway reflux in smokers

Shivam Yadav, BPT

Researcher student, Department of Physiotherapy, Galgotias University, Delhi NCR, India

Sneha Chakraverty, MPT

Assistant Professor, Department of Physiotherapy, Galgotias University, Delhi NCR, India

Abstract---Background and Purpose: The primary goal of this research is to determine the effects of respiratory exercise on smokers' airway reflux. Materials & Methods: 40 smokers between the ages of 18 and 45 were recruited for the study (18-40). Divided into two groups of 20 each. The first group was experimental and the second was a controlled group. Following the pre-test, a 4-week workout plan is created and administered four times each week. After that, the post-test is completed. Results: The results show that there is a significant effect of Respiratory exercise on Airway reflux in Smokers. Pre and Post data comparison has shown significant effects. Conclusion: The study resulted in giving a positive effect on air reflux in smokers. The respiratory exercise has helped the subjects in deciding their reflux and helped in the improvement of respiratory health. A significant drop has been seen in pre- and post-reading of the HQAR scale reading and the score of individuals' questions. Respiratory exercise must be recommended to people with the complin of Air reflux and who have a history of smoking.

Keywords---exercise, smokers, respiration.

Introduction

Cigarette Smoking is a common cause of death from several diseases and has a high global prevalence(Powell et al., 2013). It's also the biggest cause of chronic illnesses that require long-term medical care, such as chronic obstructive pulmonary disease (COPD). Smoking has the most detrimental effect on the human respiratory system, causing sickness to spread from the tiniest to the largest airways(Moussa et al., 2014). Many respiratory ailments are caused by acid reflux(Johnston et al., 2016). The bulk of the time, respiratory disease

symptoms are caused by an unknown agent(Laitman & Reidenberg, 1997). Because of the peptic illness paradigm, the importance of reflux entering the airways through the gastrointestinal system has been overlooked in the diagnosis, management, and understanding of respiratory pathology. However, airway reflux is not the same as gastro-oesophageal reflux disease (GORD)(Fitzpatrick & Blair, 2000). Heartburn and indigestion are symptoms of GORD (gastroesophageal reflux disease)6. Inflammation, fibrosis, bronchoconstriction, and cough are all caused by a non-acid gaseous mist that is formed in the upper and lower airways(Koubaa, Triki, Trabelsi, Masmoudi, Zeghal, Sahnoun, Hakim, et al., 2015). Airway reflux is said to be the cause of persistent "idiopathic" cough, late-onset asthma, COPD exacerbations, "idiopathic" pulmonary fibrosis, and even cystic fibrosis lung disease. Millions of patients are denied an explanation for their symptoms and simple, successful treatments due to clinicians' exclusive focus on the external sources of these issues and rejection of an evident intrinsic etiology. The term "idiopathic" should be avoided in many circumstances(Smith et al., 2013).

Because of our evolutionary history, humans are prone to reflux and aspiration. We are the only bipedal mammals on the planet. The esophagus hangs vertically due to our upright position, and the lower esophageal sphincter (LES) is directly above the stomach(Wen et al., 2020). The esophagus and stomach form a straight angle in quadrupeds, promoting LES closure. Humans are prone to aspiration due to a second evolutionary adaptation of the laryngeal apparatus(Juusela et al., 2013). The soft palate, arytenoid cartilage, and epiglottis work together in all other mammals to form a highly effective valve that prevents things from being aspirated into the respiratory tract(Vestbo et al., 2014). A similar system is an action in babies. When we speak, however, the soft palate remains in the throat and the laryngeal apparatus drops, allowing us to use the area below for vocalization(Morice, 2013).

The valve, on the other hand, becomes almost impotent as a result of this. Because of their bipedalism, humans are prone to reflux and aspiration due to a weak laryngeal sphincter. GORD is a serious illness. Esophagitis is caused by acid liquid reflux from the stomach into the esophagus, which causes heartburn and dyspepsia(Gibson et al., 2002). To estimate the acid exposure required to develop this condition, highly reliable diagnostic criteria, such as the DeMeester score, have been devised. This, on the other hand, is not the condition that causes breathing difficulties. The mainly or entirely non-acid gaseous mist that causes respiratory issues is non-acid. Because the esophagus is patent, as indicated on thoracic computed tomography; a so-called common cavity, this mist can move up the esophagus without causing a peristaltic wave. It's not uncommon for gas to flow in the opposite direction. When we eat, we inhale oxygen, which causes the LES to open, allowing the gas to leave(Shaw et al., 2011).

The airway obstruction and inflammatory changes that characterize chronic obstructive pulmonary disease are caused by smoking. There is no ethnic difference in how the respiratory system affects people of different races.Smoking causes considerable deficits in both active and passive forms (the latter especially in children)(de Tarso Muller et al., 2019). A few studies have looked at the impact

of respiratory exercise on airway reflux, but few have looked at the effects of respiratory exercise on people's respiratory health. Reduced airway reflux can also help to improve respiratory health(Wei et al., 2020).

Method

Inclusion Criteria

- Male between 18 to 40 years
- Smokers
- Air flux issues
- Minimum smoking duration 1 year or more.

Exclusion Criteria

- Liver problem
- On medication for any gastric issue.
- Diabetic people

The people who were selected to be in the study were there. Everyone was assured that their information would be kept private. All participants completed the consent form and gave their consent to participate in the study, after which they filled out demographic information such as their name, age, height, weight, gender, and occupation. After the completion of the consent form, the demographics including the name, age, gender, height, occupation, and address were taken-data collection was done by using the HARQ for GROUP A and GROUP B.

Group A

Then the subjects of Group A were asked to do 10 minutes of high-intensity treadmill walking at the first step of the Respiratory Excercise. Then the subjects of Group A were asked to do 5 minutes of Deep breathing at the second step of the Respiratory Excercise. Then the subjects of Group A were asked to do 2 minutes of Blowing in the respirometer(the Respirometer is in the upward direction) at the third step of the Respiratory Excercise. Then the subjects of Group A were asked to do 2 minutes of Inhaling the air in the Respirometer to lift the balls upward(the Respirometer is in the Downward direction) at the fourth step of Respiratory Exercise. Then the subjects were asked to rest for 3 minutes. Then the subjects of Group A were asked to stationary biking for 5 mins as the last step of the intervention. On the last day of the interventions, post-data was collected.

Group B

Then the subjects of Group B were asked to do 5 minutes of Deep breathing at the second step of the Respiratory Excercise. Then the subjects of Group B were asked to do 2 minutes of Blowing in the respirometer(the Respirometer is in the upward direction) at the third step of the Respiratory Excercise. Then the subjects of Group B were asked to do 2 minutes of Inhaling the air in the Respirometer to

lift the balls upward(the Respirometer is in the Downward direction) at the fourth step of Respiratory Exercise. Then the subjects were asked to rest for 3 minutes.



FIG 1: SUBJECT PERFORMING BRISK WALKING



FIG 2: SUBJECT PERFORMING RESPIROMETER



FIG 3: SUBJECT PERFORMING RESPIROMETER



FIG 4: SUBJECT PERFORMING RESPIROMETER

Result

The results show that there is a significant effect of Respiratory exercise on Airway reflux in Smokers. Pre and Post data comparison has shown significant effects. The p value less than 0.05 shows the significant difference in the subjects.

Table 1

Comparison of mean between the pre-intervention and post-intervention scores (paired t-test) of group a

VARIABLES	MEAN	SD	T VALUE	P-VALUE
PRE-SCORE	53.42	11.392	32.486	P<.001
POST SCORE	12.00	10.072	8.254	P<.001
PRE-POST SCORE	41.417	5.496	52.210	P<.001

Table 2
Comparison of mean between the pre-intervention and post-intervention scores
(paired t-test) of group b

VARIABLES	MEAN	SD	T VALUE	P-VALUE
PRE-SCORE	52.56	10.564	30.554	P<.001
POST SCORE	26.24	20.564	18.565	P<.001
PRE-POST SCORE	21.251	3.265	36.214	P<.001

Discussion

The goal of this study was to see how respiratory exercise affected air reflux in smokers. The goal of this study was to examine if there was any effect of respiratory exercise on air reflux among smokers. The findings demonstrated that Respiratory exercise had a significant impact on air reflux in the smoker group. In all settings, including air reflux, the subjects in the experimental group benefited. The study above indicates the effect of respiratory exercise on air reflux in smokers, which is similar to Joanna Elizabeth Smith et al's study in 2013(Smith et al., 2013). A high calorie and fat consumption are strongly linked to a high cough score. Weight loss, regardless of diet, is connected to a reduction in cough symptoms. Requiring patients to lose weight by restricting fat and calorie consumption could be a straightforward strategy to assist them in managing this challenging illness(Jung & Bang, 2017).

To fully grasp the nature of supraesophageal problems of gastroesophageal reflux in humans, it is vital to examine the problem within an evolutionary context. In comparison to other mammals, the structure of our mammalian relatives' aerodigestive tracts suggests that this region in humans is significantly derived. One of the mature human specializations is the acaudal location of the larynx, which results in a permanently enlarged oropharynx(Koubaa, Triki, Trabelsi, Masmoudi, Zeghal, Sahnoun, & Hakim, 2015). These anatomical characteristics support our unique breathing and swallowing processes, as well as our ability to produce expressive speech. While the selective forces that shaped human evolution favored our evolved aerodigestive tract, certain aspects of this architecture appear to be particularly unsuitable for gastroesophageal reflux(Jun et al., 2016). Indeed, the design of our aerodigestive tract predisposes us to a range of gastroesophageal reflux and supraesophageal issues. As a consequence, this study established the efficacy of respiratory exercise in the treatment of air reflux.

Conclusion

Therefore, this study resulted in giving a positive effect on air reflux in smokers. The respiratory exercise has helped the subjects in deciding their reflux and helped in the improvement of respiratory health. A significant drop has been seen in pre-and post-reading of the HQAR scale reading and the score of individuals questions. Respiratory exercise must be recommended to people with the complin

of Air reflux and who have a history of smoking. With this data, we can reject the null hypothesis in the study.

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