

Efficacy of Nadishodhan Pranayama - Alternate Nostril Breathing (ANB) on Functional Improvement in Post CABG Patient

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ABSTRACT

The Purpose of this study was to evaluate the efficacy of Nadishodhan Pranayama - Alternate Nostril Breathing (ANB) On Functional Improvement In Post Coronary Artery Bypass Graft Surgery Patient. Thirty patients (41-75 yrs) with CABG were included in the study. The study was conducted as experimental pre test and post test study design and received Nadishodhan pranayama along with conventional physiotherapy. Patients were evaluated using Chest expansion range, Peak expiratory flow rate, and 10-cm visual analogue scale for pain perception. 2 day post-operatively, peak expiratory flow rate and other variables were similar as compared to the baseline value but significantly decreased in VAS score is documented to pre-operative values. Significant difference was found in chest expansion and peak expiratory flow on the sixth day following CABG surgery. Nadishodhan Pranayama improved peak expiratory flow rate, chest expansion from the first day post-operatively. After a 6-day treatment, functional capacity was well preserved with the usage of ANB.

Keywords: Physiotherapy, Coronary Artery Bypass Surgery, Nadishodhan Pranayama, Alternate Nostril Breathing, Exercise.

INTRODUCTION

CAD is a narrowing or blockage of the arteries or vessels that provide oxygen and nutrients to the heart due to atherosclerotic plaque formation on the inner lining of the arteries. 50% Of patient with CAD present with sudden death (cardiac arrest) as their first symptom. CAD is the commonest cause for

death in western world. 3.8 million men & 3.4 million women in worldwide die each year because of CAD with the risk factors of Smoking, High cholesterol, Hypertension, Diabetes, Emotional stress, Obesity and Sedentary life¹. Coronary Artery Bypass Grafting (CABG) is the most common surgery performed in the world for CAD. The technique involves an incision down from the front of the chest through the



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sternum. For CABG, the heart is assessed through a midline incision. The surgery can be performed with cardio – pulmonary bypass i.e., OPCAB (On Pump CAB) or without cardio –pulmonary bypass (Off Pump CAB). As with any surgery post operative morbidity does exist³. The use of anesthesia, blood loss coupled with restricted mobility and pain due to incision primarily affects the oxygen transport. This leads to: Sub-optimal mucociliary escalation, Decrease lung volume and capacities, Mucus retention in lungs, Requirement of increased work of breathing. The efficacy of physiotherapy techniques used for patients following coronary artery bypass surgery (CABG) is well documented. It is a life-saving procedure which is frequently related to significant postoperative pain. Many lung defense mechanisms may become impaired, or overtly ineffective, due to intense chest pain. Although narcotics and opiates may be effective for pain control, they are associated with side effects, including respiratory depression. Therefore, there is a longstanding interest in the development of non-chemical strategies for effective pain control²

The ventilation is further affected by pain. Though various modalities and techniques are available but nevertheless none of the technique so far has been shown to produce the required improvement. Hence the postoperative treatment still remains to be optimized and lacks the much-needed standardization. Alternate nostril breathing is focused on normalizing respiratory pattern, promoting ventilation, the whole body relaxation, clearing the lung from mucus retention and reducing work of breathing⁶. This is important to control the immediate post-operative morbidity. Pranayama is one of the eight limbs of Asthanga Yoga and includes different respiratory techniques which aim to treat various physical and psychological ailments.⁴

Anulom-Vilom, or alternate-nostril breathing (ANB), is a type of pranayama that involves left nostril inhalation followed by right nostril exhalation and then right nostril inhalation followed by left nostril exhalation⁷. Several investigations have been conducted to determine the long-term effects of this technique on the cardiovascular and autonomic nervous systems in healthy and clinical populations and many of these studies have suggested that ANB leads to a shift in sympathovagal balance toward

parasympathetic dominance.⁵ Among the various yoga practices, the alternate nostril breathing (ANB) is a fairly simple and commonly performed exercise. The practice of ANB is traditionally considered to relieve mental unrest and promote physical and mental balance⁹. There have been studies to assess the effects of ANB technique on specific physiological and cognitive functions⁷. There is evidence for a balancing effect of ANB on the activity of both cerebral hemispheres⁸

METHODOLOGY

- Inch tape
- Pen
- Paper
- Chalk
- Stop watch
- 6 MWT Chart
- Daily assessment chart
- Cardio respiratory evaluation chart

Selection criteria

Inclusion criteria

- Age limit: 50-60
- Patient who had undergone median sternotomy incision for CABG
- Both sexes were taken for the study
- Patients willing to participate on a voluntary basis

Exclusion criteria

- Age below 50 and above 60
- Unstable vital signs
- COPD and other lung pathology
- Neuromuscular /Musculoskeletal disorders
- Rib fracture
- Osteoporosis
- Metastatic cancer thorax
- Smokers excluded

Sample size

Total number of 60 patients were selected for the study. 30 out of them were excluded.

Sample format

The study was conducted as experimental pre test and post test study design and received Nadishodan pranayama along with conventional physiotherapy.

Interventions

Study duration and Schedule

The study was carried out for a duration of 2 months and the treatment duration was carried out for the period of 7 days. The patients were treated daily for 30 minutes once daily and the values of the parameter selected were assessed on the 2nd post operative day , 4th post operative day and 6th post operative day.

Table 1: Visual Analogue Scale

SI No	Pretest	Pretest	Diff
1	9	3	6
2	7	3	4
3	10	6	4
4	8	3	5
5	6	2	4
6	9	4	5
7	7	3	4
8	10	5	5
9	7	3	4
10	6	2	4
11	9	3	6
12	8	4	4
13	10	5	5
14	9	3	6
15	6	4	2

Table 2: Chest Expansion

SI No	Pretest	Pretest	Diff
1	1	1.8	0.8
2	1.5	3	1.5
3	1.8	2.2	0.4
4	1.5	3.2	1.7
5	1.5	2	0.5
6	1	2.7	1.7
7	1.9	2.5	0.6
8	1.5	2	0.5
9	1.8	3.3	1.5
10	1.5	3.2	1.7
11	1	2.7	1.7
12	1.8	2.9	1.1
13	1.3	2.9	1.6
14	1.0	2.9	1.9
15	1	2.7	1.7

Outcome measures

- The parameters recorded were,
- Chest expansion three levels
 - Visual Analogue Scale
 - Peak expiratory flow rate

Description of Technique

- Alternate Nostril Breathing (ANB)
- Chest Physiotherapy
- Percussion
- Vibration
- Shaking

Statistical tools

The was conducted in a pre test and post test study design with a multivariate formate. The “t” test used to analyse the variable

The “t” value was calculated using the formulae,

$$S = \sqrt{\frac{\sum(x_1 - x_1^{\frac{1}{2}})^2 + \sum(x_2 - x_2^{\frac{1}{2}})^2}{n_1 + n_2 - 2}}$$

$$T = \frac{x_1^{\frac{1}{2}} - x_2^{\frac{1}{2}}}{5}$$

Table 3: Peak Expiratory Flow Rate

SI No	Pretest	Pretest	Diff
1	60	240	-180
2	100	190	90
3	60	270	210
4	120	240	120
5	100	290	190
6	60	240	180
7	150	290	140
8	60	240	180
9	120	190	70
10	150	270	120
11	100	190	90
12	100	190	90
13	100	270	170
14	150	290	140
15	100	290	190

DISCUSSION

The purpose of the study is to determine “efficacy of nadishodhan pranayama - alternate nostril breathing (anb) on functional improvement in post cabg patient” the study was conducted out for a period of 8 weeks. pain has been pointed out as one of the chief concerns of patients following cabg.

In the present study, it was found that conventional chest physiotherapy including deep breathing exercise, secretion removal maneuvers, assisted coughing and nadishodhan pranayama significantly decrease pain and improved pef rate, chest expansion and vas score

In our study PEF rate, chest expansion and VAS measurement was performed post operatively on 2nd POD and repeated on the 4th and 6th POD

The patients were encouraged to perform the deep breathing exercises once per hour throughout the day. In our study all patients

in the experimental group found the breathing technique easy to perform and most of the patients experienced a subjective benefit of the exercises; this is important for completion of the treatment.

We studied the effect of alternate nostril breathing in post CABG subjects using . Three outcome measures were used to evaluate the effect of the intervention, Visual Analog Scale, chest expansion and peak expiratory flow rate. The results of the study show that there was a significant phase effect on the VAS scores, suggesting that ANB did induce significant reduction in pain, increases chest expansion and peak expiratory flow rate in the study subjects.

CONCLUSION

Practice of ANB after uncomplicated CABG maximizes chest expansion, peak expiratory flow rate and reduction in pain which may be attributed to improvement in positive affect, decrease in stress, anxiety, depression and negative affect. Continued follow up of these cases is planned.

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