

# A study on effect of dietary counselling on COPD patients

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■ **ABSTRACT :** The prevalence of chronic obstructive pulmonary disease (COPD) have gone through significant changes over the past decade. This article examines how the treatment and management of COPD has become more individualized. In addition, complications and medication are evaluated and the importance of diet including the patient perspective when designing a treatment plan is discussed. Finally, new advances in technology and research, clinical communication, exercise and disease education is introduced which helps in the efforts on COPD management.

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**C**hronic obstructive pulmonary disease (COPD) refers to pulmonary diseases that cause breathing difficulties and block airflow from the lungs. COPD or chronic obstructive pulmonary disease is a progressive disease that make breathing hard. "Progressive" means this disease get worse with time if not treated properly.

COPD is a name invented for the diseases that were previously known as chronic bronchitis and emphysema. The British Medical Research Council (BMRC) defined chronic bronchitis as "daily productive cough for at least three consecutive months for more than two consecutive years (Lancet, 1965). The National Heart, Lung and blood Institute defined emphysema as "a condition of a lung categorized by abnormal, permanent enlargement of airspaces distal to the terminal bronchiole, accompanied by the destruction of changes of the alveolar walls (Snider *et al.*,1985).

There are many factors that contribute to the

development of COPD. The most common irritant that causes COPD is cigarette smoke. Breathing in second hand smoke like air pollution, chemical fumes, dust from the environment or work place also can contribute to COPD. Rarely a genetic condition called alpha-1 antitrypsin deficiency may play a role in causing COPD. People who have this condition have low levels of alpha-1 antitrypsin (AAT)- a protein made in liver. Having a low level of the AAT protein can lead to lung injury and COPD if exposed to smoke or other lung irritant.

The symptoms of COPD include shortness of breath, long-term cough, often with excess mucus, recurrent respiratory infections, wheezing, tightness in the chest, cyanosis, or a blue discoloration of the lips or fingernail beds and fatigue .

In COPD, the following tests may be performed:

– **Spirometry:** A machine called a spirometer that measures how much air one is able to inhale and exhale and how fast one is able to do so.

– Arterial blood gas analysis: This test measures how much oxygen and carbon dioxide are present in the blood. A high percentage of carbon dioxide in the blood can be a sign of poorly functioning lungs caused by COPD.

There are wide variations in the prevalence of COPD across countries. The growing prevalence with the disease onset after 35-40 years of age increases with age but very rare in the younger age groups. Alpha-1 antitrypsin deficiency patients distinctly more common amongst men and smokers. Since tobacco smoking is the most known and established risk for COPD. Significantly, both the M: F and the smoker: non-smoker ratios for COPD in India are not as high as in the Western populations (Jindal *et al.*, 2001 and 2006).

COPD is common in elder population and is highly widespread in those aged more than 75 years. The global prevalence of physiologically defined chronic obstructive pulmonary disease (GOLD stage 2 or more) in adults aged  $\geq 40$  yr is approximately 9-10 per cent (Halbert *et al.*, 2006).

The burden of obstructive lung disease (BOLD) study from 12 sites involving 9425 subjects who has completed post bronchodilator spirometry testing found that overall prevalence of COPD of GOLD stage II or higher was 10.1 per cent and the prevalence was 11.8 per cent for men and 8.5 per cent for women (Buist *et al.*, 2008).

Buist *et al.* (2008) largely recognized to the indoor-air pollution from domestic combustion of solid fuels for cooking and heating to which the women are significantly more exposed. This is particularly so in the rural and hilly areas where the solid biomass fuels and tobacco smoke are primarily used.

Chronic respiratory disease (CRD) is one of the most common causes of disease burden both globally and in India. CRD includes asthma and chronic obstructive pulmonary disease (COPD) which together may account for an projected burden of about 100 million individuals in India. Prevalence rates varying from 2 per cent to 22 per cent in men and from 1.2 per cent to 19 per cent in women (Jindal, 2010).

McDonough *et al.* (2011) have recently reported extensive obliteration of terminal bronchioles in patients with COPD who have emphysema, suggesting that “the permanent enlargement of the distal airspaces may serve only as a structural biomarker, being a secondary result

of small airway inflammation and destruction”. Mitzer in 2011 reported that COPD has both airway (central and small airways) and airspace abnormalities.

The Indian study on epidemiology of Asthma, respiratory symptoms and chronic Bronchitis in Adults (INSEARECH) involving a total of 85105 men and 84470 women from 12 urban and 11 rural sites had shown that the overall prevalence of chronic bronchitis in adults  $>35$  year was 3.49 per cent. Based on this study there are wide variation in the prevalence of COPD in Indian subcontinent. The national burden of chronic bronchitis was estimated as 14.84 million (Jindal *et al.*, 2012)

In 2012, The Global Initiative for Chronic Obstructive Lung Disease (GOLD) recently defined COPD as “a common preventable and treatable disease characterized by continuing airflow limitation that is usually advanced and associated with an enhanced chronic inflammatory response in the airways and the lung to noxious particles or gases.

COPD is a major cause of morbidity and mortality across the globe. According to WHO estimates, 65 million people have moderate to severe COPD. More than 3 million people died of COPD in 2005 corresponding to 5 per cent of all deaths globally and it is estimated to be the third leading cause of demise by 2030.

### Objectives :

- To find out COPD related complications in patients.
- To record the dietary pattern of COPD patients.
- To analyse the effect of dietary counselling on COPD patients.

### ■ RESEARCH METHODS

The locale for the study is Chatrapati Shivaji Subharti Hospital, Meerut. In 2015, the present study of 50 subjects of COPD with either sex has been purposively selected. The age group varied from 25 years to 45 years and COPD patients suffering from other diseases were excluded.

### Study design:

The study had been conducted in two phases. A total of 50 subjects of COPD of either sex were critically examined under the supervision of doctors and dieticians

working in that hospital. Nutritional status were assessed by 24 hour dietary recall method and anthropometric methods. Dietary diagnosis were made. The food consumption pattern were divided into following four categories.

**Normal diet:**

A normal diet is a meal plan that includes a selection of foods from all of the five food groups. A healthy meal plan is low in unhealthy fats, salt and added sugar.

**Improper diet :**

It includes three aspects: starvation and overeating, unhygienic food and food partiality. Starvation refers to two dissimilar things: prolonged lack of food and protracted insufficient intake of food. Unhygienic food refers to eating unclean food. Food partiality refers to food eating due to the liking of foods with certain tastes or specially eating certain foods.

**Poor diet :**

Poor eating habits include under- or over-eating, not having enough of the hale and hearty foods we need each day, or consuming too many types of food and drink, which are low in fibre or high in fat, salt and/or sugar.

**Nil :**

Eating not at all.

Anthropometric measurements of patients were also recorded. Height and weight measurements were taken using stratometer and bathroom weighing scale, respectively. According to the data obtained Body Mass Index of patients were calculated. After Nutritional status assessment of patients their complaints were recorded and the patients were counselled according to their complaints as given in Table A. A leaflet providing advice on nourishing food were given (Table A).

Along with the above recommendations, the

following dietary guidelines were suggested to patients.

**Energy:**

Bulky patients can lose weight by eating fewer calories. But don't eat so few calories that one feel fatigued and hungry all of the time. Using less energy with daily tasks can help patients have more energy to do more activities during the day.

**Protein:**

Protein needs should be high enough to stimulate protein synthesis, prevent muscle atrophy, and maintain lung strength but should not add excess calories to the diet. Skim milk powder to hot milk, cereal, eggs can be included in the diet. This will add extra protein and calcium to your diet. High protein poultry, meats, cheese, legumes, vegetables and nuts also can be added.

**Fluids:**

Drinking enough fluids is essential for the thinning and clearance of your pulmonary secretions. For COPD patients 8 to 12 cups of caffeine- free liquids per day is suggested. It will also help in preventing constipation.

**Sodium :**

Sodium levels should be reduced in the diet. Consuming excessive sodium can lead to fluid retention which can damage patient's shortness of breath.

**Potassium :**

Potassium is necessary for muscle contractions in the body. It is especially important to the heart muscle. High or low levels of potassium can cause serious irregularities of heartbeat.

**■ RESEARCH FINDINGS AND DISCUSSION**

In this study, the data was collected using interview and questionnaire method. The age group varied from 25-45 years. Out of 50 sample, 41 (82%) subjects were

Table A : Complications in COPD and related dietary recommendations		
Sr. No.	Complications	What to do
1.	Shortness of breath	Provide 5-6 meals per day. Helps to keep stomach from filling up too much which gives lung room to expand
2.	Cough	Try drinking half cup orange juice after having dairy products which help in thin mucus
3.	Fever	Take rest and eat smaller frequent meals
4.	Chest pain	Take rest
5.	Dental problems	Try fish instead of pork chop or cooked vegetables instead of raw vegetables
6.	Fatigue	Rest before meals. Eat smaller frequent meals.

**Table 1 : Mean and standard deviation before and after counselling**

Nutrients	Before		After	
	Mean	± SD	Mean	± SD
Energy (kcal)	1500	18.4	1700	5
Protein (g)	35	0.7	53	1.2
Fat (g)	10	0.6	18	.7

males and 9 (18%) subjects were females. Also, 26 (52%) subjects were illiterate and 24 (48%) subjects were literate. Out of 24 (48%) subjects, 14 per cent of total subjects were having their education qualification upto primary level only while 20 per cent were educated upto secondary level. 12 per cent had passed their high school and only 2 per cent were qualified at inter mediate education respectively .more than half (52%) of total subjects were uneducated towards understanding the importance of diet in their daily routine. The occupation of 19 (38%) subjects were farming and 14 (28%) were worked as labourers, while 14 (28%) were indulged in business and only 3 (6%) subjects were worked in private sector. 60 per cent of the people were belonging to Lower income group, 34 per cent and 6 per cent were belonging to Middle income group and upper Middle income group.

The frequency of eating the 2 meal diet pattern before counselling was 16 per cent and 32 per cent were following the 3 meal diet pattern while 38 per cent were eating 4 meal diet pattern, only 14 per cent follow 5 meal diet pattern which means about 50 per cent are having poor nutrition and rate of survival is less. Out of 50 sample data on food eaten showed 92 per cent ate breakfast and 24 per cent ate fruits in the snacks time. After dietary counselling, frequency of eating the 2 meal diet pattern was reduced to 8 per cent and 16 per cent follow 3 meal diet pattern while 76 per cent started eating 5-6 meal pattern. Before counselling, 24 (48%) individuals were on improper dietary pattern mainly *i.e.* insufficient intake of food *i.e.* starvation, 10 (20%) people were on poor diet mainly due to not eating healthy food each day, 11 (22%) subjects were on normal diet because of eating food from all the five food groups and 5 (10%) were unable to take food due to nausea and vomiting after eating. Consumption of energy, protein and fat was lower than RDA that is there consumption were 60 per cent, 58 per cent and 50 per cent, respectively.

Overall, 40 per cent of COPD patients were normal whereas 45 per cent were underweight and only 7 per cent were overweight. The most common problem prevalent in COPD patients was shortness of breath.

They were advised to eat 5-6 meals in a day which helps to keep away stomach to be fill and room for lungs to expand. After dietary counselling, 76 per cent subjects started eating normal diet and follow 5-6 meal pattern and 72 per cent included orange juice in their basic diet which helps in thin mucus. It helps in building up immunity and made them feel more energetic. Energy consumption was 70 per cent, protein was 88 per cent and Fat was 90 per cent. Also increase in fluid intake and reduction in sodium intake was seen and potassium intake was almost normal. According to the ADA's Manual of Clinical Dietetics, it is best to supplied energy needs but avoid overfeeding as "excess calories are more important in the production of carbon dioxide than the carbohydrate to fat ratio" (Ilaria, 2009). It is best to meet but not exceed energy needs to keep both carbon dioxide and RQ levels in check.

The energy intake increased from 1500 kcal to 1700 kcal after counseling the patients as their dietary consumption got better. The intake of protein through diet were very less as compare to the requirements that also found increased from 35 g to 53 g.

As the modification in the meal frequency and amount were incorporated in the diet, there better increase were found at each level and in each nutrient intake (Table 1).

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