Effect of Yogic Breathing Techniques in New Sputum Positive Pulmonary Tuberculosis

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ABSTRACT

A 24-year-old, unmarried woman diagnosed of pulmonary tuberculosis (PTB) visited our hospital out-patient department in the month of August-2013. Patient came with the complaint of sever cough with expectoration; evening raise of temperature; gradual loss of appetite and weight since 2-weeks. We referred the patient to our hospital’s Revised National Tuberculosis Program, direct observed treatment short-course center for sputum fluorescence microscopic examination (FME). FME report suggested the new smear positive, 2+ PTB. Our patient received yogic breathing techniques (YBT) for 45-min daily under the supervision for three alternate-days/week with anti-tuberculosis treatment (ATT) for the period of 8-weeks. After intervention our result showed better improvement in weight gain, body mass index, symptom scores, pulmonary function and health related quality of life with conversion of positive to negative FME for acid fast bacilli. It suggests YBT with ATT are effective in treating PTB and further studies required to warrant this effect.

Keywords: Anti-tuberculosis treatment, pulmonary tuberculosis, yogic breathing techniques

INTRODUCTION

Tuberculosis is one of the major cause of morbidity and mortality throughout the world, especially in developing country[1] like India. An estimated tuberculosis patients are 1.96-million/year and among them 0.8-million are new smear positive (NSP) cases with 0.33-million deaths/year, i.e., 1000 deaths/day (two deaths/every 3-min) making it the highest tuberculosis burden country in the world.[2] There are many studies deals with effect of various breathing techniques (BT)/pranayama on bronchial asthma,[3] but none of the studies reported the effect of only yogic breathing techniques (YBT) in patient with pulmonary tuberculosis (PTB) made us to select this present study with the aims and objective to evaluate the effect of YBT in patient with NSP PTB on body weight, body mass index (BMI), symptom score, pulmonary function (PF), sputum-fluorescence microscopic examination (FME) and health related quality of life (HRQL).
CASE REPORT

The present case is about a 24-year-old, unmarried woman diagnosed of PTB visited our hospital out-patient department in the month of August-2013. She came with the complaint of sever cough with expectoration; evening raise of temperature; gradual weight loss; and loss of appetite since 2-week. We referred the patient to our hospital’s Revised National Tuberculosis Program, direct observed treatment short-course center for sputum-FME. FME report suggested the NSP, 2+ PTB. Institutional ethics committee of our college of medical sciences and hospital approved the study protocol and written informed consent form was obtained from the subject.

INTERVENTION

Patient received YBT for 45-min a day for 3 days/week with anti-tuberculosis treatment (ATT). The ATT intensive phase drugs and YBT used in our study were explained in Table 1.

### Table 1: ATT and YBT used in our study

<table>
<thead>
<tr>
<th>ATT</th>
<th>YBT</th>
<th>Procedure</th>
<th>Duration</th>
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<tbody>
<tr>
<td>Rifampicin</td>
<td>OM chanting</td>
<td>It involves slow and deep inhalation followed by produce (chant) the sound OM till the end of exhalation in sukhasana (ease pose)</td>
<td>5-min</td>
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<tr>
<td>(450-mg)</td>
<td>Hand stretch breathing</td>
<td>It involves raising both hands in front of chest, at shoulder level with palms facing each other. Stretch the hands from inside to outside while inhalation and contract the hands to the normal position while exhalation</td>
<td>10-min</td>
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<tr>
<td>Isoniazide</td>
<td>Cat stretch breathing</td>
<td>It involves kneeling down on floor and keeping the palms in front of corresponding knees 2 feet apart with head flexed position. Raise the head backward and push the back downwards while inha</td>
<td>5-min</td>
</tr>
<tr>
<td>(600-mg)</td>
<td>Bhashrika pranayama (bellows breath) breathing</td>
<td>It involves breath in and out forcefully and rapidly as much as possible in sukhasana</td>
<td>5-min</td>
</tr>
<tr>
<td>Ethambutol</td>
<td>Alternate nostril breathing</td>
<td>It involves breath in through left nostril followed by breath out through right nostril and vice-versa in sukhasana</td>
<td>10-min</td>
</tr>
<tr>
<td>(1200-mg)</td>
<td>Relaxation</td>
<td>It involves relaxation in savasana (corpse pose)</td>
<td>5-min</td>
</tr>
<tr>
<td>Pyrazinamide</td>
<td>Bhastrika pranayama (bellows breath) breathing</td>
<td></td>
<td></td>
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<tr>
<td>(1500-mg)</td>
<td></td>
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</table>

Dose: 3 dose/week for 8-weeks (each dose was given on Monday, Wednesday and Friday respectively-1 min of relaxation was given in between all the practices (i) time of practice: Around 8.30-am to 10.00-am, (ii) duration of practice: 45-min/day, (iii) period of practice: 3 days (Monday, Wednesday and Friday)/week for 8-weeks (similar like ATT dose) ATT=Anti-tuberculosis treatment, YBT=Yogic breathing techniques
expressed in percentage; forced expiratory flow rate, i.e., \( \text{FEF}_{25\%} \), \( \text{FEF}_{50\%} \), \( \text{FEF}_{75\%} \) and \( \text{FEF}_{25-75\%} \) and peak expiratory flow (PEF) expressed in liter/second. The SVC, FVC maneuvers were repeated at least thrice during each measurement and the highest of three acceptable readings were taken as the final values of that sitting.\[6\]

Sputum-FME (before and after 8-weeks): Two sputum samples were examined with the use of light emitting diode fluorescence microscope by using
auromine O staining method. Result and its grading: Negative = 0 – acid fast bacilli (AFB)/100-high power fields (HPF); Scanty = 1-9 AFB/100-HPF; 1+=10-99 AFB/100-HPF; 2+=1-10AFB/1-HPF; 3+= >10-AFB/1-HPF.[7]

HRQL (before and after 8-weeks): SF-12 questionnaire was used to assess the HRQL. It is a tool of choice that is able to produce two summary scales (physical, mental health state) which are shortened from SF-36 with accuracy.[8]

RESULTS

Our result showed improvement in weight gain, BMI, symptoms score, spirometric variables such as SVC; FVC; FEV1; PEF; FEF25%; FEF50%; FEF75% and FEF25-75% with conversion of positive to negative sputum-FME in our patient [Table 2].

DISCUSSION

BT used in yogic practices shown to improve PF.[5] Improvement in PF after YBT with ATT is a good prognosis of diseases because extensive parenchymal and pleural involvement in PTB leads to residual fibrotic changes with reduced vital capacity and other lung volumes.[4] Treated cases can leads to some complications including progressive loss of PF, persistent pulmonary symptoms etc.[9] A systematic review showed the positive association between past history of tuberculosis and presence of chronic airflow obstruction, which is independent of cigarette smoking.[10]

Adverse effects of medication, prolonged treatment duration, some cultures and social stigma etc., may diminished HRQL of patients with tuberculosis.[11] Increase in SF-12 health survey score in our patient indicates better HRQL and it may attribute to reduction of adverse effect of medication and improvement in emotional stability. The conversion of positive to negative sputum-FME may attribute to increased immunity by reduced stress level because yogic practices are known to reduce stress, which can reduce vulnerability to infections.[4]

Previous study on yoga for PTB showed better weight gain, symptomatic relief, increased lung capacity and better sputum conversion during the intensive phase of ATT supporting our study.[4] The study duration restricted to the intensive phase of ATT is limiting the scope but better improvement in disease prognosis within the same duration will give hope for the patient undergoing ATT, which may useful for the better control of PTB.

CONCLUSIONS

The result of our study suggests YBT with ATT are effective in treating PTB. Further studies are required in a large scale to warrant this effect.

REFERENCES


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