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Research Article

A Clinical Review on Low Dose Short Wave Diathermy Therapy as a Physical Antibiotic on Covid-19 Pneumonia

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Abstract

COVID-19 pandemic mostly affects respiratory system resulting in cough, sputum production, dyspnoea, hypoxemia as in pneumonia. Currently, 5 % of COVID-19 cases require admission to ICU due to respiratory distress. The global current treatment options mostly followed for ARDS due to COVID-19 pneumonia include high flow nasal canula (HFNC), non-invasive ventilation (NIV), mechanical ventilation with lower tidal volumes and continuous positive airway pressure (CPAP). There is high risk of aerosol dispersion during these techniques provoking the risk of cross infection, as most of the COVID-19 hospitals are not having negative pressure isolation rooms. There is also an acute shortage of mechanical ventilators globally. Short Wave Diathermy is a physical therapy antibiotic which has antimicrobial effects, possessing the capacity to reduce cyanosis, pain, dyspnoea, cardiac embarrassment and induces restful sleep. Short wave diathermy with acute precautionary measures could be beneficial in reducing the temperature, improving circulation, reducing respiratory rate, grunt and Pain.

Keywords: COVID-19; Pneumonia; Short Wave Diathermy; Physical Antibiotic

1. Introduction

COVID-19 disease caused by corona virus shows early patterns a trend similar to Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS) [1]. COVID-19 often shows pneumonia like symptoms like hypoxemia, cough (68%), sputum production (34%) and shortness of breath (19%) [2]. Approximately, 5 % of COVID-19 cases require admission to ICU due to respiratory distress [3]. According to the Berlin definition of ARDS, it is a specific disease, with distinctive features of severe hypoxemia associated with near normal respiratory system compliance. The most common patterns of COVID-19 pneumonia are Type -L characterized by Low elastance, Low ventilation to perfusion ratio, Low lung weight and Low recruitability. The second pattern being Type H appertaining to High elastance, High right to left shunt, High lung weight and High recruitability [4, 5]. The COVID-19 pneumonia pattern depends on interaction between the severity of infection, host response, physiological reserve, comorbodities, ventilator responsiveness of the patient to hypoxemia, time between onset of disease and intervention.

The Biomarkers play an important role in diagnosis and prognosis of Pneumonia and are now considered as gold standards in medicine. The common biomarkers used to detect the pneumonia are C-reactive protein, Leucocytes count, immunoglobulin and pro-inflammatory cytokines etc [6, 7, 8]. The global current treatment options mostly followed for ARDS due to COVID-19 pneumonia is High flow nasal canula (HFNC), continuous positive airway pressure (CPAP), non-invasive ventilation (NIV), mechanical ventilation with lower tidal volumes [5, 9]. Nearly 5 % of cases require mechanical ventilation which is now an endemic in the developing world [10]. A high flow nasal canula or non-invasive ventilation is not recommended till viral clearance [11].

There is high risk of aerosol dispersion during these techniques provoking the risk of cross infection, as most of the COVID-19 hospitals are not having negative pressure isolation rooms [12]. Apart from the cross infection, non-invasive ventilation in pneumonia patients temporarily improves oxygenation, reduces work of breathing but doesn't change the natural disease course [13]. Short wave diathermy (SWD) is a deep tissue heating modality that exerts therapeutic effects by using electromagnetic radio waves at a frequency of 27.12 MHz [14, 15] and 11m wavelength. It provides both thermal and non thermal effects where the non thermal effects of SWD are based on low dose (Oligothermic) [16]. The production of non-thermal effects is due to the vibrations induced to the tissue molecules when exposed to the radio waves [17, 18]. SWD has been used to treat severe respiratory infections like pneumonia before the invention of antibiotics. The diathermy is believed to increase the white blood cell count, blood flow to the area. It also detoxifies the liver [19].

2. Methodology

The pneumonia cases are diagnosed using the Biomarkers as a gold standard. The best identified protocol for delivering SWD in pneumonia patients was recommended by Jan Zbigniew Szopinski (2014) in the paper reflexive physical therapies postulated the

protocol for treating chronic obstructive pulmonary diseases. The condenser electrodes place at a distance of 4 cm from the treated region for duration of 15-20 min by contra planar method. The electrodes are placed parallel on opposite planes, in pneumonia they are placed on anterior and posterior aspects of Chest wall (Figure 1). The recommended dosage is described as oligothermic, very mild thermal sensations to hyperthermic, strong but not unpleasant sensations [20].

Figure 1: Application of SWD.

3. Discussion

The bio- thermal therapy [21] which uses deep tissue heating for various clinical conditions is a research based approach which dates back 200 years ago. SWD is frequently used in infections and has a century back long track record of improving infection guidelines. It is frequently called as "physical therapy antibiotic". It has a track record of reducing 50% death rate in pneumonia and doubling the recovery rates. In the corona virus naturopathic guidelines (COVID-2019), Portland clinic of Holistic Health, recommended the use of Short wave diathermy in COVID-19 pneumonia to combat the infection and inflammation of the lungs, reduce mortality and enhance recovery [22]. The benefits of SWD on the Pneumonia were first recognized by Frederick DeKraft and Byron Sprague Price, of New York, about the year 1906.

In 1921, there was a severe Pneumonia epidemic in U.S. marine Hospital, New York, a study was conducted on 41 patients with radiologically and laboratory diagnosed pneumonia cases, where 20 cases were given SWD and 21 were controls. The death rate was 17 % in experimental, i.e. SWD group compared to 42 % in control group [23]. From the above study, the established physiological effects of SWD in pneumonia patients are as follows [24]:

1. Temperature: There was a drop of temperature resulting in conserving body energy, reducing pulse and respiratory rate.

2. Circulation: there was a lessening of cyanosis and was more evident when lower lobes are affected. This effect is due to decrease in pain and improvement in the intrapulmonic circulation around the consolidated areas. It decreased the load on the right ventricle, resulting in improvement in the quality of pulse.
3. Respiration: The respiratory rate was reduced by an average of five per minute and respiratory grunt disappeared. All these effects are contributed to improved pulmonary circulation in response to heat.
4. Pain: There was reduction in pain resulting in reduced anxiety levels and improved respiratory efforts.

A maximum of six to eight treatment sessions with SWD showed marked reduction in the size of inflammation and pulmonary opacity in radiographs. SWD applied through the chest in pneumonia patients provides a sense of well being by *dues ex machine* principle. It has also shown to reduce bronchospasm, general relaxation and reduction in the viscosity of mucous aiding in proper drainage [25].

4. Conclusion

SWD is a physical therapy antibiotic which has antimicrobial effects, possessing the capacity to reduce cyanosis, pain, dyspnoea, cardiac embarrassment and induces restful sleep. The use of SWD in treating pneumonia has been successful since 1906. In the present pandemic COVID-19, where 5 % of the cases need mechanical ventilation due to development of pneumonia like symptoms, SWD can be given at oligothermic dosages to combat the infection and respiratory distress. As there is global shortage of ventilator, a risk of aerosol dispersion cross infection, Short wave diathermy with acute precautionary measures could be beneficial in reducing the temperature, improving the circulation, reduction in respiratory rate and grunt, Pain. SWD may be included for RCT to study the effect of the cases of COVID pneumonia.

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Conflicts of Interest

The authors declare no conflicts of Interest

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