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IMPLICATIONS OF COVID 19 IN THERMAL POWER PLANT WORKERS: A CLINICAL PERSPECTIVE

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Abstract:

Thermal plant is the vital industrial setup for electricity generation. Electricity is the most necessary requirement of life this day with modernization and use of computers and air conditioners which now has become part of life. The thermal power plant workers are exposed to gaseous and particulate emissions as well as coal particulates. These air pollutants exert a adverse effect on health and lungs are the target organs which may get affected. Moreover with evidence of Interstitial Lung Disease and Compromised pulmonary functions as noted in Thermal Plant Workers; these workers are likely to have higher risk of severe manifestation of COVID 19. The thermal power plant workers are needed to practice safety precaution like wearing of mask, personal protective equipments like wearing gloves, face shields as well as to have regular health checkup since occupational health risk are evident under thermal plant work environment apart from special precautionary measures such as hand washing and social distancing in COVID appropriate behavior.

Key Words: Thermal Plant; COVID 19; Pulmonary, compromised, safety, measures

Introduction:

Thermal plant is the vital industrial setup for electricity generation. Electricity is the most necessary requirement of life this day with modernization and use of computers and air conditioners which now has become part of life. The thermal power plant workers are exposed to gaseous and particulate emissions as well as coal particulates. These air pollutants exert a adverse effect on health and lungs are the target organs which may get affected. [1.2] The thermal power plant workers are needed to practice safety precaution like wearing of mask, personal protective equipments like wearing gloves, face shields as well as to have regular health checkup since occupational health risk are evident under thermal plant work environment. We have observed in our clinical cases study conducted earlier regarding interpretation of pulmonary functions in thermal Power Station workers who were working for last fifteen to twenty years at the thermal power plant in maintenance & repair unit of the thermal power station. The detailed clinical examination, Chest X-Ray and hematological investigation reports revealed that these workers were having Interstitial Lung Disease.[3]

Clinical Manifestation of COVID 19:

COVID 19 pandemic emerged from Wuhan China in 2019. COVID 19 is the Corona Virus Disease 2019 caused by Severe Acute Respiratory Syndrome Corona Virus 2 (SARS COV 2). The acute manifestation in this disease are fever, dry cough, sore throat, malaise, fatigue, shortness of breath, diarrhea, loss of taste and smell sensation and acute respiratory distress. The severe complications associated with COVID 19 are pneumonia, acute respiratory failure, septic shock, acute liver injury, acute renal injury, disseminated intravascular coagulation, arterial and venous thrombosis and thromboembolism. [4] The patient with comorbidities such as hypertension, diabetes, cardiovascular diseases, Interstitial Lung Diseases, immune compromised states such as Sickle Cell Anemia, Lupus Erythematous, Acquired Immune Deficiency Syndrome etc.[4,5] Agile population who have comorbidities and lowered immunity are prone for increased morbidity and mortality.[6] The precautions against most common comorbidities like hypertension by regularly monitoring of blood pressure and intake of medications and blood glucose and complete blood count can be helpful in preventing severe complications associated with COVID 19.[7,8]

Health Risk in Thermal Plant Workers:

Moreover with evidence of Interstitial Lung Disease and Compromised pulmonary functions as noted in Thermal Plant Workers; these workers are likely to have higher risk of severe manifestation of COVID 19. The effect of thermal power environment on the human population shall further enlighten regarding the health risk in these workers.

The commonly associated risks are:

- The emission from power plant consist mainly carbon dioxide, carbon monoxide, oxides of nitrogen, oxides of sulfur and lead; and hydrocarbons. The poisonous mixture of smoke, fog, air and other chemicals acts as a environment pollutants. The adverse health effect of these air pollutants on workers in thermal power plant includes, acute & chronic respiratory disease, lung, carcinoma, cardiovascular disease apart from neurological manifestations.[1,2,9]

- The fire retardant materials & insulation used in electrical setup of thermal plant are made of asbestos, synthetic materials and minerals. The permissible concentration of these substances indoor is 0-1 fibre/ml and the recommended rate of indoor-outdoor concentration ratio should be around 'one'. If the ratio is altered these substances act as air pollutants and potentiate respiratory attacks and asthma spells.[10,11]
- The chlorinated biphenyls which are commonly used in transformers manufacturer are known to affect the airway and its resistance and may damage the alveoli. Their exposure risk to chlorinated biphenyls toxicity may occur during repairs and maintenance of these transformers. [12]
- These thermal plant workers are exposed to cadmium oxide (fume dust) while maintaining the electrical equipments and may develop cough, pneumonia and pulmonary fibrosis. [13]
- The most common source of exposure for radiation in thermal plant workers is electric transmission lines, which generate 60 Hertz radiation field. The exposure to electric field can alter cellular, physiological & behavior events as evident with animal studies though it was not possible to extrapolate these findings in human.[14,15]

Thermal Plant Workers and Safety Norms:

We wish to highlight that all safety norms are followed by any industrial setup and use of personal protective equipments mask, face shields, hand gloves is recommended for these workers. But chances of infections exist beyond there working places and as observed in our study that 25 of the thermal plant workers who had developed restrictive lung disease resided in housing colony adjacent to the plant; so environmental air pollution effect of this industrial unit might have disseminated into neighboring environment having a perpetuating health effect in these workers. As all of our 25 thermal plant workers were smokers and under regular follow-up check up in our governmental college; we eventually opined that smoking coupled with failure to comply with safety instructions due to lax attitude might be the cause for respiratory function deterioration. Though thermal plant definitely poses health hazard and occupational health and safety instructions are needed to be follow up meticulously.[3]

We recommend regular environment surveillance for air pollution and regular health check-up by Occupational Physiologist & Physicians will help in preventing any health ill effects.

Thermal Plant Workers and COVID 19:

All thermal plant workers being at risk for contracting COVID 19 infection should:

- Follow social distancing at workplace as well as in daily course of life.
- Use face mask.
- Maintain hand hygiene and regularly wash hands for at least twenty seconds each time.
- Avoid touching door, knobs, handles, support railing as well as shaking hand with anyone. Washing hands after touching any surrounding items.
- Avoid going for social gatherings.
- Avoid touching nose, eyes, face etc.
- Get the room and sitting place sanitized at your work place.

To conclude practice of COVID 19 safety norms shall prevent the high risk thermal plant workers from contracting COVID 19 infection and thereby prevent mortality and morbidity in them.

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