Human Health and Mining- A Study of Effect of Coal mining on the Health of workers in Rajouri district of Jammu and Kashmir

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Abstract

Mining operations related to the extraction of minerals from the ores are vital from economical point of view but at the same time these operations prove harmful for the workers especially when negligible health care facilities are available to them. An analysis of the coal mining in Rajouri district of Jammu and Kashmir reveals that almost all the workers suffer from one or the other occupational disease. Majority of the workers suffer from not less than two diseases and by percentage, the higher incidence is of orthopedics (66.38) followed by different diseases of lungs (47.25), Psychiatric problems (18.45), Influenza (16.21) etc. The main reasons for these diseases besides exposure to harmful gases (CO_2, CH_4 etc) are least health care facilities, absence of Coal Mining Safety and Health Act 1999, illiteracy of workers, minimum medical allowances. For sustainable coal production in the state, all these problems must be addressed with zeal and vigor.

Keywords: Mining Rajouri Healthcare Coal Influenza Psychiatric

Introduction

Mining operations are large scale industrial operations with significant environmental impacts. Mining is destructive to the immediate landscape and create significant amounts of waste. Even regulated and controlled mining sites release toxins into the surrounding environment (EPA, 2007). Mining uses large amounts of energy and consume 7-10 percent of the world's energy production annually. The combustion of high volumes of fossil fuels release toxic substances such as mercury and polycyclic aromatic hydrocarbons (PAHs) into the atmosphere and thus pollutes the environment (Gaffney & Marley, 2009). Mining operations are also noisy and noise produced by human activities reduces the population of animals nearby. Animals ranging from birds to deer are known to avoid areas with significant amounts of noise produced by people (Barber et al, 2009). Mining is a dangerous occupation, and consistently has some of the highest fatality rates among all industries (Bureau of Labour Statistics, 2008). The creation of large scale industrial mining operations will undoubtly pose threats on local communities, health of nearby environments and native cultures and usually mining hazards fall into two groups: accidents and industrial diseases. It is stressful, difficult and hazardous work. Prolonged separation of mine workers from their families and communities can cause conflicts at home. This is especially true for couples with children where one partner is left as a single parent (NSMA, 2002).

Another problem arises when numerous outsiders are hired, usually for management positions. This influx of outsiders into indigenous communities can lead to conflicts about local values, language and social structure (Gibson & Klinck, 2005). Mines are notorious polluters. Mining activities may also release arsenic, lead, mercury and other toxic metals which are in one way or other fatal to workers. Mercury causes personality changes, deafness, changes in vision, loss of muscle coordination or tremors, loss of sensation, and difficulties with memory. Miners' exposure to silica dust, a component of crushed rock, increases the risk that miners would develop silicosis, a disease of the lungs (Stephens & Ahern, 2001). Cyanide is an extremely toxic substance and exposure to high levels of cyanide damage the heart and brain and can lead to coma and death (ATSDR, 2006).

Objectives

The study was carried to accomplish the following objectives:

(i) To study the impact of mining activities on the human health.

(ii) To analyze the effects of coal mining on the health of workers in different coal mines of Rajouri district of Jammu and Kashmir

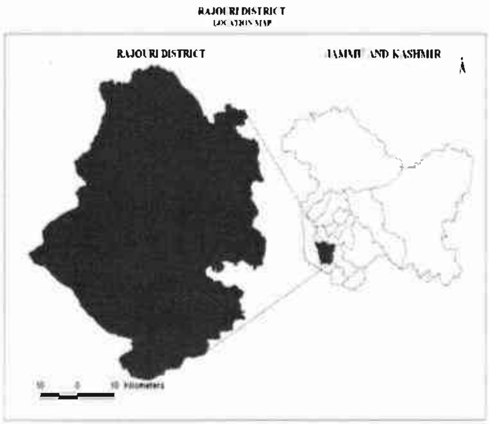
(iii) To suggest suitable measures for the betterment of the workers and hence for the sustainable productivity as the health of workers is directly related to productivity.

Database and Methodology

The database for the present study constitutes both the primary and secondary sources. Primary data was collected through questionnaire, interviews etc. and secondary data was gathered from various departments like J&K Minerals Limited, The data gathered was analyzed and guided to come up with meaningful inferences. Data pertaining to different diseases of workers was correlated with their nutritional status and exposure of the workplace and thus the severity of the causes and effects were ascertained and hence the suitable suggestions were given to overcome the problems.

Study Area

Rajouri is the part of Western Himalayas and is located between 70° to 74°4′E longitude and 32°58′ to 33°35′N latitude (Map 1.1) and the altitude varies between 600-3500 meters above the mean sea level. It is bounded by the Poonch district in the north, Jammu district in the South, Udhampur district in the east and Mirpur area under the occupation of Pakistan (PoK) in the west. The district is spread over an area of 2630 sq. kms and is divided into 6 Tehsils, 7 blocks, 70 panchayats, 385 villages and 4 towns on administrative lines. It presents a composite culture of Pahari, Gojri, Dogri and Kashmiri. Irrespective of ethnic group all speak the Pahari language. The entire area is undulating and exhibits varied geomorphic patterns. The climate varies from sub-tropical in the southern part to temperate in the mountainous northern part. The district is well known for its mineral resource production like coal and has a peculiar status in the state.



Source: Census of India Map 1.1

Results and Discussions

Occupational Diseases and Health Status of Coal Mine Workers

The occupational diseases are the illness caused by the substances or conditions that the worker was brought into contact with at the workplace. Occupational exposures contribute to the morbidity and mortality (Lax et al., 1998). A variety of respiratory diseases, Pneumoconiosis etc are also occupational in origin (Chattopadhyay and Sanyal, 2007). The nervous system is a frequent target of toxins including organic solvents, metals, and pesticides. More commonly chronic organic solvent exposure is responsible for a syndrome that includes headaches, fatigue, light-headedness, cognitive difficulties and depression. These diseases are the reflection of nutritional availability and other infrastructural amenities offered to workers.

In hazardous industries like coal mining, the working environment leads to a high incidence of occupational diseases and injuries. This creates substantial burden on management in the form of reduced productivity of workers and on the workforce in the form of increased health care expenditure (Falk and Jurgelski, 1979). An analysis of the prevalence of the diseases and injuries faced by workers is of great importance as it may indicate the possible means of intervention to reduce such losses. Almost all coal workers are educationally backward with low literacy, so they are ignorant about the implications of occupational diseases and their symptoms. The pattern of most prevalent diseases is presented in table 1.

Table 1: Broad Classification of diseases and symptoms

Name of Group	Diseases and Symptoms in Group
Lung related	Asthma, Cough, Tuberculosis, Whooping Cough, Cold
Orthopedics	Body Pain, Gout, Lower Back Ache, Spondilosis
Cardiac	Chest Pain
Tension related	Blood sugar, High blood pressure, Low blood pressure, Head ache
Influenza	Fever
Intestinal infection	Gastritis
Dermatological	Skin infection e.g. Dermatitis
Miscellaneous	Accidental injuries, renal problem, surgical cases, typhoid etc.

Based on this classification, the disease profile of mine workers in the study area has been shown in table 2 and fig 1.1

Table 2: Disease profile of mine workers in Rajouri District

Group of diseases	Percentage of infected workers
Lung related	47.25
Orthopedics	66.38
Tension related	18.45
Influenza	16.21
Intestinal infection	14.51
Cardiac	11.57
Dermatological	9.98
Miscellaneous	17.67
Total	**70**

Source: Based on Field Survey

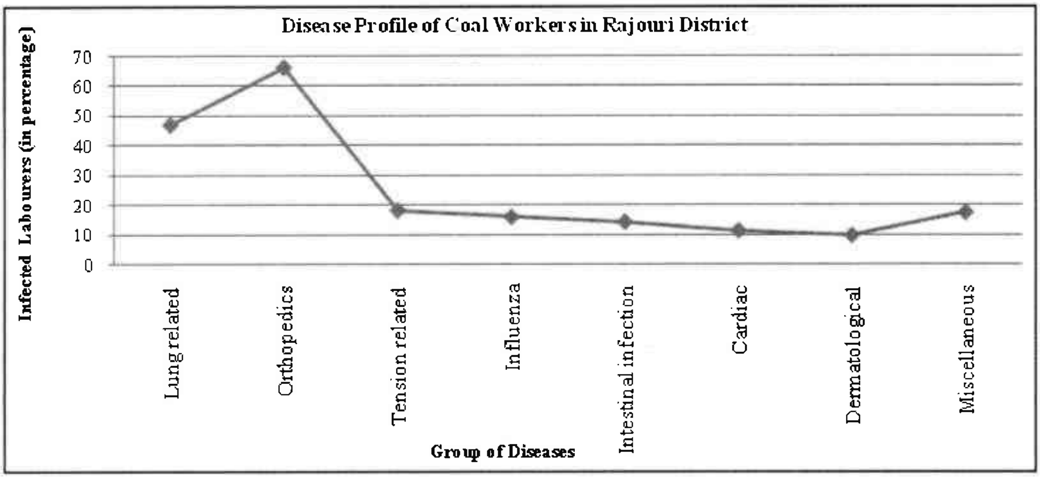


Fig.1.1

It is inferred from the study that 70 percent of mine workers suffer from more than one disease. The table 2 reveals that most of the workers are affected by pain (66.38 percent) and lung related diseases (47.25 percent) followed by tension related (18.45 percent), miscellaneous (17.67 percent), Influenza (16.21 percent), intestinal (14.5 percent), cardiac (11.57 percent) and dermatological (9.98 percent) diseases. The pain problem is more pronounced due to the manual work, as the labourers work physically more than their capacity for cutting, transportation from working phase to main phase where the haulage is located etc. The lung related diseases are due to coal dust, temperature of mines & exposure to gases like methane, CO_2 etc. These diseases create lot of problems for coal labourers. Injuries remain a significant problem and range from the trivial to fatal. The common causes of injury include rock fall, falls from height, mobile equipment accidents, sting and electrocution. It has been found that most of the accidents occur due to either carelessness of the miner or due to negligence of the mining regulations.

Nutritional Causes of Diseases

An individual's nutritional status is dependent on the provision of sufficient nutrient substances and the best utilization of these nutrients. Poor status of nutrition may be caused by eating inadequate amount of food both in terms of quality and quantity and due to failures in digestion and the utilization of these nutrients (WHO, 2002). An individual's selection of food is influenced by many factors such as food habits and socio-cultural background as well as lack of awareness concerning balanced diet (WHO, 1992). In the study area the staple diet of the coal workers is maize and wheat deriving the bulk of essential amount of energy for their work and performance. Carbohydrates contribute more than ninety percent of the total calories, proteins are less in diet and fat content is negligible except the little comes through the consumption of edible oils. Workers consume very small quantity of fruits, which are the main source of vitamins and minerals (Table 3).

Table 3: Diet intake by Coal workers and Levels of nutrition

Food intake of Coal Workers					
Commodity (gms)	**Per head / Per day**				
	Protein (Kcal.)	**Fats (Kcal.)**	**Carbohydrates (Kcal.)**	**Percentage energy derived from carbohydrates**	**Total energy (Kcal.)**
Maize (210)	93.24		556.08	77.47	717.78
Wheat (140)	67.66		388.5	81.33	477.63
Rice (60)	16.32	2.7	187.68	90.79	206.7
Pulses (65)	57.7		153.1	68.65	223.0
Vegetables (150)	15.0	4.9	47.4	70.43	67.3
Mutton (6)	5.1	1.0	-	-	6.1
Eggs (2gm)	1.0	2.3	-	-	3.3
Milk (185)	26.6		34.0	21.64	157.1
Fruits (20)	0.85		17.42	92.65	18.8
Edible oils(3)	-		-	-	-
Total	**283.4**		**1384.18**	**73.71**	**1877.71**

Source: Computed on the basis of Field Survey

The physiological function of food may be divided into three general categories; the need for food material to supply energy, to build and maintain the cells and tissues, and to regulate body processes. Substances called nutrients which are found in the food satisfy these needs (Subar, 1998). Analysis of diet consumption by coal workers of study area reveals the inadequacy of all these values which reflect the poor status of their health conditions. Dietary inadequacy is very high in coal workers under study which is mostly due to poor purchasing power. Equally important are the ignorance of dietary principles and food wastages.

Other Causes

Coal Mining Safety and Health Act 1999 is absent in study area as no standard health care rendering institution of any order exist in coal mine localities governed and managed by mine authorities. At present the management arranges periodic health checkups at intervals of 5-6 years. This period is too long in a hazardous environment where health problems often assume a chronic nature and may even threaten the life of the worker. Further, the checkups are not taken with necessary care and medical records and disease registers of workers are not maintained to study disease surveillance. The permanent worker is facilitated with medical allowance as applicable to state employees but casual labourers are denied from the same. For more serious health problems, the workers have to approach to private hospitals for their treatment. Under such conditions the real state of health conditions in the mines is quite dismal and arrests the attention of coal mine management for better health care delivery system.

Conclusion

Mining is an ancient occupation, long recognized as being arduous and liable to injury and disease (Donoghue, 2007). The whole lifecycle of mining consisting of exploration, mine development, mine operation, decommissioning and land rehabilitation. By and large mining imposes threats to the workers as they are exposed to various harmful gases like Carbon dioxide, methane etc and dust (Hendryx, 2009). In the above paras detailed description has been presented about the various diseases faced by the coal mine workers in the Rajouri district of Jammu and Kashmir. The workers are prone to diseases on account of the exposure to harmful gases, nutritional deficiencies and least available health care facilities. The main diseases which engulf majority of the workers are orthopedics, Tuberculosis, Psychiatric, Influenza etc. A comprehensive approach is needed to overcome such problems in order to ensure the better health status of the workers and hence the sustained productivity of the coal in Jammu and Kashmir.

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