A CROSS SECTIONAL STUDY OF SKIN DISEASES AND ITS ASSOCIATION WITH RIVER WATER AMONG NON-MINERS LIVING AROUND THE IRON ORE MINING AREA OF ODISHA

Original Research

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Abstract
Background: Skin diseases is commonly found in stagnant water, but in mining area we found skin diseases are more prevalent among people who used river water in mining Area. **Objective:** To study prevalence of skin diseases and their association with River Water among Non-Mining People living around mining area. **Materials and Methods:** We organized Cross sectional study to investigate skin diseases and its association with River water by using self-report questionnaire to estimate the different type of skin diseases Written consent has been taken from all the participants before starting study. Total 121 peoples participated through random sampling method through various camp. Cross sectional study method was used in this study. We included the various variables to explore the relationship between different types of skin diseases with Water in iron ore mining area. **Result:** In our Study we found that water flow in mining area through river, ponds, tubewel is the important causing factors for skin diseases and it is highly associated with skin diseases. **Conclusion:** In our study we found that majority of peoples suffered of skin disease who used river water for bathing. people who used ponds water were less suffered of skin diseases in compare of people who used river water, and people who use tubewel are minimum suffered of skin diseases in compare of people who used river water and ponds water.

INTRODUCTION

Odisha is rich states in India in terms of minerals, different kinds of mineral are found in Odisha. According to Government sources of Odisha" (60 p.38).
"The Keonjhardistrict is rich in minerals among all district" (60 p. 38). The heavy metals are dominant in this the region which is Iron Ore and causative factors of many diseases among them respiratory and skin diseases are more found in iron mining region.[1]
It was found that underground mining is more dangerous in compare of surface mining, and people are more affected with occupational diseases in underground mining.[2] In some study it revealed some skin diseases are associated with gender and socioeconomic status.[3]
Globally, mining is the contributory factor in deforestation, contamination of soil waste water disposal and pollution of river water which cause different kinds of health issue in human population.

[2,4-6]Majority of coal miners suffered of' Pneumoconiosis (black lung disease) due to components of dust.[2,7] While prevalence is more in china. 2,8 In some study in china it was seen prevalence of 6% is double to 11% in those people who suffered with tuberculosis,so any type of mining cause the health issue it doesn't matter it is iron ore or coal mining.[2,9]
Globally, mining is a major source of growth for country but mining is the also major source of pollution in environment, water and contamination of soil, aerosol which directly and indirectly cause the health issue in human population.[2,10,11] Coarse particles combined to form dust particle which spread in the air and aerosol and in contacted of skin it irritates the skin and cause skin diseases.[2,12,13] When dust particles mixed with River water.[2,14] It polluted the river and when these water is used by peoples then they suffered of different kind of skin disease.[15]
The poor's don't have a many choice in housing, they usually lives very near to the mining area. 16

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Main route of exposure for families, and pregnant women are the house dust.[2,17,18]

"My study area is all the population in peripheral villages who residing the nearby of mining area. So my study was prevalence of skin diseases in people who are not engaged in mining work and its association with its River water in mining area".[1]

Earlier in some study it was revealed that more exposure to iron dust dust for prolonged periods of time contributed to different kinds of health issue and disease.[1,19]

The prevalence of skin diseases is 7.86% to 11.16% in among general population, but its prevalence is more in mining region.[20] Skin diseases are one one major causing factors for financial loss. The cutaneous signs of skin are dryness, redness, loss of elasticity, seborrhea and itching.[1,21] Surface mining method is the one of the important method of extraction, it is used by majority of extraction.[22]

Hence this study was conducted to study the prevalence of skin diseases and their association with River Water among Non-Mining People living around mining area.

MATERIALS AND METHODS

We arranged a community-based, Cross sectional study to investigate skin diseases and its association with River water by using self-report questionnaire to estimate the different type of skin disease. Written consent is taken from all the participants before starting the study. Total 121 peoples participated through simple random sampling method through various camp. Here we used the lottery method to exclude biased. Participants who are more than 18 years old are included in this study.

We organized many small camp among human population in peripheral villages in mining area from beginning July 1, 2021- to September 2021. Before stared the study we already taken the approval from the institutional review board

All eligible population were examined physically and clinically by our Team in Joda Block of Odisha. All the Clinical investigation diagnosis were made by Dermatologist and medicine specialist on the basis of physical and clinically in the camp. Written consent was taken from all participants. Only villagers were allowed in the camp. No any outsider was allowed in the camp. After diagnosed all the patients were categorized into skin diseases and non-skin diseases.

Data is put in excel sheet then mean, median and association is analyzed by spss version 20.

RESULT

In our study, there were 54.5% female and 45.5% were male. All the Participants are divided into 2 groups by age. Total 58.7% participants were belonged to less than 40 years. And rest 41.3% participants were more than 40 years in our study.

Among 121 participants, number of males were 45.5 % and Number of female were 54.5 %. Total 89.1 % male are suffered of skin diseases among 55 male and 10.9 % male are not infected. And male's number were 43.4% among total 113 infected participants [Table 1].

Table 1: Association of Gender withthe Skin Diseases

			Suffered of skin diseases		Total
			yes	no	
sex	male	Number ofPeople	49	6	55
		Percentage of Male suffered of skin diseases	89.1%	10.9%	100.0%
	female	Number of people	64	2	66
		Percentage of Female suffered of skin diseases	97.0%	3.0%	100.0%
Total			113	8	121

Prevalence of skin diseases is more in female and majority group of population was suffered of skin diseases in their 2nd and 3rddecades. In Our study female 54.5% were more suffered of skin diseases as compared of male 45.5%. Age is also important variable which is associated with skin disease in mining area. In table II it was seen that 64.5 % participants were less than 40 years. 93.6 % people were suffered of skin diseases who were less than 40 years among 78 participants and 93%people were suffered of skin diseases who were more than 40-year age group among 43 participants [Table 2].

Table 2: Association of Age with the Skin Diseases

			Suffered of skin diseases		Total
			yes	no	
age	less than 40 years	Number of people	73	5	78
		% within age	93.6%	6.4%	100.0%
		% within skin diseases	64.6%	62.5%	64.5%
		% of Total	60.3%	4.1%	64.5%
	more than 40 years	Number of people	40	3	43
		% within age	93.0%	7.0%	100.0%
		% within skin diseases	35.4%	37.5%	35.5%
		% of Total	33.1%	2.5%	35.5%
Total			113	8	121

In our study total 93.4% were infected with skin diseases among them 60.3% participants were below 40 years age group and 33.1% participants belonged to above 40 years age group. It proved that younger age groups are more susceptible to skin diseases as compare to older age group. In this study, it was seen that skin diseases are associated with age factors in mining area.

Water is important variable which is highly associated with skin diseases in mining area, "Total 93.4% peoples are suffered of skin diseases among 121 participants and 6.6% are not suffered of skin diseases among them (Chi Square = 2.73, Df=2, p value=0.03). Here it not accepting null hypotheses so it is significantly". So skin disease is associated with bathing in River water [Table 3].

Table 3: Association of different type of source of water with Skin Diseases

			Suffered of skin diseases		Total
			yes	no	
Source of water	River	Number of people	62	2	64
		% of people suffered of diseases	96.9%	3.1%	100.0%
	Ponds	Number of people	36	4	40
		% of people suffered of diseases	90.0%	10.0%	100.0%
	Tubewell	Number of people	15	2	17
		% of people suffered of diseases	88.2%	11.8%	100.0%
Total			113(93.3%)	8(6.61%)	121

In our study no of participants who use river water for bathing are 64% among 121. Total 40% use ponds for bathing, and 17 %participants use tube well for bathing. It indicates that people who use of water for bathing from any kinds of sources like River, tube well, ponds, all are suffered of skin diseases. But people who more dependent in river water are more suffered of skin diseases as compare of other sources

This variable show that water flow in mining area through river, ponds, tube well is the important causing factors for skin diseases and it is highly associated with skin diseases.

In our study total 113 people suffered of skin disease among 121 participants. Among them majority of participants were suffered of scabies 35.5%, then 19%people were suffered of Tineacorporis, 17.4% were suffered of Dermatitis and 21.5% were suffered of allergy diseases. And only 6.6% were found non-skin diseases in mining area.

Table 4: Frequency of different type of skin diseases.

		Number	Percentage
1	scabies	43	35.5%
2	Tinea corporis	23	19.0%
3	Dermatitis	21	17.4%
4	allergy	26	21.5%
5	non skin diseases	8	6.6%
	Total	121	100.0

Total 113 people were suffered of skin diseases among 121 participants. 35.5% people were suffered of scabies diseases among them 48.8% were depend on river water for their routine daily activities, 41.9% people were depending on ponds and 9.3% people were depending on tube well in our study, Scabies35.5%% was more Prevalence as compare to other skin diseases [Table 5].

Table 5: Association of different type of skin diseases with water

			Source of water			Total
			River	Ponds	Tubewell	
Skin diseases	scabies	Number of people	21	18	4	43
		% within skin diseases	48.8%	41.9%	9.3%	100.0%
		% within source of water	32.8%	45.0%	23.5%	35.5%
	Tinea Corporis	Number of People	13	9	1	23
		% within skin diseases	56.5%	39.1%	4.3%	100.0%
		% within source of water	20.3%	22.5%	5.9%	19.0%
	Dermatitis	Number of people	14	6	1	21
		% within skin diseases	66.7%	28.6%	4.8%	100.0%
		% within source of water	21.9%	15.0%	5.9%	17.4%
	allergy	Number of people	11	6	9	26
		% within skin diseases	42.3%	23.1%	34.6%	100.0%
		% within source of water	17.2%	15.0%	52.9%	21.5%
	non skin diseases	Number of people	5	1	2	8
		% within skin diseases	62.5%	12.5%	25.0%	100.0%
		% within source of water	7.8%	2.5%	11.8%	6.6%
Total			64	40	17	121

DISCUSSION

In this study major aimed to show the prevalence of skin diseases and their association with River Water among Non-Mining People living around mining area. Skin diseases is commonly found in stagnant water, but in mining area we found skin diseases are more prevalent among people who used river water. Some research journal showed that high iron rich water causative factors for bacterial infection and skin diseases in human beings, so people who resides near iron ore are more susceptible to skin diseases as compare to other people.

Table I: It showed among 121 participants, number of males were 45.5 % and Number of female were 54.5 %. Total 89.1 % male are suffered of skin diseases among 55 male and 10.9 % male are not infected. And male's number were 43.4% among total infected participants. Total 97 % female participants were suffered of skin diseases among 66 female participants. Its total number was 56.6% among total infected patient.

In our study, female participants were more suffered of skin diseases as compare of male patient. Because female patient more use River water, bore well water for their daily routine activities as compare to male patient.

Table II: It showed that Age is also important variable which is associated with skin disease in mining area.In table II it was seen that 64.5 % participants were less than 40 years. 93.6 % people were suffered of skin diseases who were less than 40 years among 78 participants and 93%people were suffered of skin diseases who were more than 40-year age group among 43 participants.

It proved that younger age groups are more susceptible to skin diseases as compare to older age group.

Because younger age group more engaged in daily activities as compare to older age group and they more depended on river water like farming, bathing.

Age factor is associated with skin diseases and in earlier study it was seen that age is also associated with skin diseases in mining area.

water is important variable which is highly associated with skin diseases in mining area, "Total 93.4% peoples are suffered of skin diseases among 121 participants and 6.6% are not suffered of skin diseases among them (Chi Square = 2.73, Df=2, p value=0.03). Here it not accepting null hypotheses so it is significantly" (24 p. 39). So skin disease is associated with bathing in water.

This variable show that water flow in mining area through river, ponds, tube well is the important causing factors for skin diseases and it is highly associated with skin diseases.

We also find that people who use river water for bathing they are more suffered of skin disease in compare of ponds and tube well. Less number of people are suffered of skin disease who depend on bathing for tube well. Water polluted by different kinds of metal iron, copper and manganese cause's skin diseases and health issue. It was also mentioned in some journals.[1,28]

In our study total 113 people suffered of skin disease among 121 participants. Among them majority of participants were suffered of scabies 35.5%, then 19%people were suffered of tineacorporis 17.4% were suffered of tineacapitis and 21.5% were suffered of allergy diseases. And only 6.6% were found non-skin diseases in mining area.Heavy metal pollution is one of major risk factors for human population and it directly affects health and cause different kinds of diseases, Earlier in some study it was mentioned.[1,29]

In some some epidemiological study of dermatology it was seen that prevalence of skin diseases in mining area. And most common diseases are dermatitis, Scabies Tineacorporis. 3,30-33

Total 113 people were suffered of skin diseases among 121 participants. 35.5% people were suffered of skin diseases among them 48.8% were depend on river water for their routine daily activities, 41.9% people were depending on ponds and 9.3% people were dependingon tube well.

In above table it was showed 21.5% people were suffered of allergy diseases among them 42.3% were depend on river water for their routine daily activities. 23.1% were depend on ponds and 34.6 % people were depend on tube well water for theirs daily activities. In our study we found that all type of skin disease happened in those people who were more depended on river water as compare to other source of water.

CONCLUSION

In this study we found that peoples suffered of different type of skin diseases who used river water for bathing. Peoples who used ponds water were less suffered of skin diseases in compare of people who used river water, and people who use tube well are minimum suffered of skin diseases in compare of people who used river water and ponds water. And it is also found that people could be suffered of skin diseases even they did not engage in mining work due to exposure of mining product and dust particle in water if they used it in their daily routine activities. Majority of people suffered of skin disease as compare to other diseases. And these diseases were dominant only those area, where maximum peoples were engaged in mining.

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