Epidemiological Surveillance in the Vicinity of Sardar Sarovar Health Projects and its Impact of Health and Morbidity Status of the Population

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ABSTRACT

Introduction: Water borne and communicable diseases: Gastrointestinal disorders, particularly dysentery, diarrhoea and parasitic infections are very common among tribal regions of Maharashtra, leading to marked morbidity and malnutrition. The present study was a epidemiological surveillance in the vicinity of Sardar Sarovar Health Projects and its impact of health and morbidity status of the population.

Material and methods: It was a cross sectional, analytical study. The study was conducted in Nandurbar district Maharashtra. The affected villages by Narmada Sarovar water kept under active surveillance during study period by the health staff and selected local leaders from villages.

Results: There were total 872 cases of malnutrition reported within two year. Out of this 85% were from >1 yrs of age group and 15% were from below one year of age group. Out of 872 cases of malnutrition 44% were Male and 56% were females. Majority of malnutrition Cases were from >1 yrs of age group as compared to the below one years of age group, this data is subjected to statistical analysis the difference is found statistically not significant.

Conclusions: Strengthening of the existing health services and existing infrastructure in the affected and rehabilitated area and active involvement of local leaders with some incentives (Pada worker, ASHA). NGOs and CBOs in diseases surveillance system.

Keywords: Epidemiological Surveillance, Vicinity of Sardar Sarovar Health Projects, Impact of Health and Morbidity Status of the Population

INTRODUCTION

Ten percent of the total population of the State of Maharashtra belongs to tribal population groups. These groups remain isolated, living in remote forest and hilly areas far from civilization. Majority of them have poor health status, peculiar health needs and a wide prevalence of red blood cell genetic disorders that complicates their health problems further. Moreover, the inadequate health infrastructure in tribal areas to deal with such complicated health problems is a matter of grave concern.[1]

As per the recent information available from the Govt. sources, Maharashtra State ranks second in population and area wise third in the country. (As per the 1991 census, the total population of the State is 80 million and this is 9.33 percent of India's population). The total tribal population in the State is 7.4 million that accounts to about 9.3 percent of the total population of the State.[1]

There are three mountain ranges in the State known as Sahyadri, Satpuda and Gondwan ranges. In total, there are 47 scheduled tribal population groups in the State and majority of them are inhabitants of these geographically difficult terrain. Out of these 47 groups, 17 are major tribal groups. In the Sahyadri ranges there are the Mahadeo Koli, Katkari, Warli, Malhar Koli and Kokana groups. Among Satpuda ranges, Bhil, Pawara, Korku and Tadavi are the major groups. The Mafia, Gond, Pardhan, Halbi Otkar, and Andhra are found in the Gondwan range.[2]

These tribal groups differ from each other in various aspects. They differ in the language they speak, in their cultural pattern and socio-economic categories. As the majority of these tribal groups living in the remote forest areas remain isolated, untouched by civilization, they are largely unaffected.

Water borne and communicable diseases: Gastrointestinal disorders, particularly dysentery, diarrhoea and parasitic infections are very common, leading to marked morbidity and malnutrition. Malaria and tuberculosis still remain a problem in many tribal areas, while the spectrums of viral

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and venereal diseases have number been studied in-depth. It was pointed out by the health survey and development committee that "Malaria is by for the most important disease in India from the point of view of mortality and morbidity and the economic loss it entails is immense.[3]

The inadequate health infrastructure for these peculiar health needs of the tribal is also a major factor. There remains a conspicuous lack of maternal and child health services among the hilly tribal areas and consequently, the tribal demographic scenario is one of high fertility, high maternal and infant mortality rates.

Vector borne diseases

Malaria is an internationally devastating disease, producing nearly 600 million new infections and 3 million deaths each year. Malaria, a disease of antiquity, has proved to be a formidable deterrent to the cultural and socio-economic progress of man in the tropical, sub-tropical and monsoon prone zones of the world. History is replete with instances of devastation caused by this disease. Wide distribution and its intensity of transmission in India were important factors for slow economic, scientific and industrial progress in the country during last two centuries. However, towards the end of the last century, when the biological characteristics of vector-borne diseases began to be unraveled through pioneering research initiated by Sir Ronald Ross, the mechanism of transmission of human malaria began to be revealed. Malaria is one of the major public health problems in the developing countries.[4]

Recent estimates indicate that between 300-500 million clinical cases and between 1.5-2.7 million deaths due to it, occur worldwide annually, 90% of which occur in tropical Africa. It is estimated that 1.2 billion people out of the 1.4 billion people of SE Region live in Malarious areas. In 1995, malaria cases in the region were estimated at 21.9 million, with almost 32,000 deaths. India accounts around 85% of the total reported cases in the region in the same year. During 1996 also, India contributed 83% of total malaria cases in SE Region.[5]

Thus around 80% of reported cases in the region are being contributed by India. Malaria is a complex disease and various factors influenced by human activities and natural calamity like excessive rainfall, flood, drought and other disasters have great bearing on mosquito genetic conditions leading to increased potential for malaria transmission. Like any other disease, natural transmission of malaria depends on the presence of, and relationship between the three basic epidemiological factors: the agent, the host and the environment. While the malaria parasite is the true agent of infection, the female Anopheles mosquito is the agent of transmission. The environment is considered from three aspects; physical, biological and socio-economic.[6]

The Sardar Sarovar Health Project has evolved as result of initiative taken by Dr. Subhash Salunke Director of Health services of Maharashtra to promote meaningful collaboration of the health services with activities of the preventive & social medicine departments of Medical colleges.

The Sardar Sarvor Health Project has been initiated since March 1995 by the PSM department of T. N. Medical College Mumbai, under the guidance of Director of Health serve ices with the aim of epidemiological surveillance in the vicinity of Sardar Sarvor Projects. The T. N. Medical College Mumbai shown inability to implement this project further.

The present study was conducted to establish effective diseases surveillance mechanism to monitor health and morbidity indicators and to assess and reassess changes in health and morbidity pattern of the study population periodically.

MATERIAL AND METHODS

It was a observational cross sectional, analytical study done for the period of 1 April 2005 to 31st March 2007. The study was conducted in Nandurbar district Maharashtra. The affected villages by Narmada Sarovar water kept under active surveillance during study period by the health staff and selected local leaders from villages.

Study setting: 28 Affected Villages in Dhadgaon and Akkalkuwa taluka and 05 rehabilitated villages in Taloda taluka of Nandurbar district by Sardar Sarovar Project.

To strengthen the diseases surveillance system in the affected and rehabilitated area we have selected two local leaders/pada worker /sandesh wahak from each village or pada with the help of medical officer of concerned primary Health center so there were 79 pada workers in both affected and rehabilitation area. These selected local leaders/pada worker /sandesh wahak from each village or pada paid nominal honorarium per report so we get regular report for the said period from this area.

These selected local leaders/pada worker /sandesh wahak.; were trained about

- Creating awareness about VBDs & WBDs in community
- Identifying suspects by symptomatic diagnosis
- Reporting of symptomatic diagnosed cases from village level in pretested local Language format.

These local leaders are taken in the field and asked to fill the format which is prepared in their local language those who are having difficulty to fill the format these workers were trained again so it was insured that format will be filled correctly by these workers.

B) Health workers

Research team, Medical officer and three health supervisor and other health workers from primary Health centers are also trained in the one day workshop about diseases surveillance system.

- Supervision of pada workers.
- Creating awareness about VBDs & WBDs in community
- Confirmation of suspected symptomatic diagnosed cases reported by pada workers.
- Regular reporting of Confirmed cases.
- Monitoring of reporting units from study area.

After training of research officer and health supervisor about

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the diseases surveillance and monitoring of reporting system they were appointed at the three region one at Akkalkuwa Taluka, one at Dhadgaon Taluka, one at Taloda talukas. These pada workers were reported suspected cases of various diseases to health worker of the sub centre after confirmation of cases by health worker; cases were reported to higher authority in study area. The reports are collected monthly from rehabilitated area and quarterly from affected area in the two years study period by research team.Thease reports are computerized and analyzed.

The study area is divided in to two blocks

A) Rehabilitated
B) Affected

A) Rehabilitated Area - This area includes rehabilitated population inTaloda taluka from affected area of Dhadgaon and Akkalkuwa talukas.The population of this area is approachable by roads and having all basic facility like electricity, water supply, adequate health services and well built houses. This area includes following villages.

B) Affected area-This area includes 28 affected villages by SSP from Dhadgaon and Akkalkuwa taluka. The population of villages which is affected by back water of the Sardar Sarvor Dam because all this population resides on the bank of Narmada river. This area is very difficult to approach because of dense forest and hill area no approachable roads. electricity, transport facility are available.

This area is made approachable through the Narmada river water it self by putting floating boat hospital in the Narmada river water. These floating boat hospitals are providing health services to the affected population weekly visit with Medical officer and paramedical health workers and necessary medicine. This affected area includes following villages from Dhadgaon and Akkalkuwa talukas.

RESULTS

In the present epidemiological investigation conducted at the affected area of Sardar Sarovar Dam, there were 4226 Suspected cases of various diseases out of them 2144 cases of diarrhoea, 706 cases dysentery, 22 cases of Enteric fever, 14 cases of hepatitis, 26 cases of Malaria, 57 cases of Pulmonary Tuberculosis, 13 cases of Leprosy, 42 cases
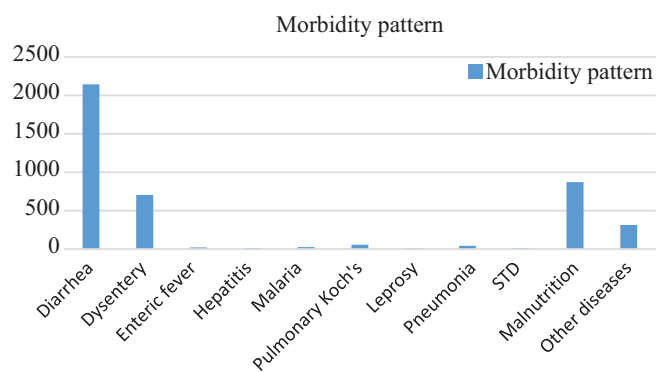

Figure-1: Distribution of morbidity pattern

Parameters			Affected	Rehabilitated
Waterborne diseases	Gender	Males	1268	408
		Females	928	282
	Age	<5 years	350	104
		>5 years	1846	586
Communicable diseases	Gender	Males	282	85
		Females	185	59
	Age	<5 years	138	48
		>5 years	329	96
Hepatitis	Age	<5 years	2	1
		>5 years	8	3
Diarrhoea	Age	<5 years	265	87
		>5 years	1309	493
Enteric fever	Age	<5 years	2	1
		>5 years	15	4
Dysentery	Age	<5 years	91	15
		>5 years	514	86
Malaria	Age	<5 years	2	1
		>5 years	16	7
Pulmonary Tuberculosis	Age	<5 years	7	1
		>5 years	39	10
Table-1: Comparison age and gender with various diseases				

Parameters			Affected	Rehabilitated
Malnutrition	Gender	Males	280	105
		Females	370	117
	Grades	Grade III	582	204
		Grade IV	68	18
Table-2: Comparison between presence of malnutrition and age and gender				

of Pneumonia, 15 cases of Sexually Transmitted diseases, 484 cases of Scabies, 872 cases of grade III and Grade IV malnutrition and 315 cases of other diseases in study area from April 2005 to March 2007 (Figure 1).

There were 2886 cases of water borne diseases in study area, out of these 2196 cases were from affected area and 690 cases from rehabilitated area. Majority of cases were from affected area as compared to rehabilitated were also males were suffered more as compared to females. (Table 2)

There were 611 cases of other communicable diseases in study area, out of these 467 cases were from affected area and 144 cases from rehabilitated area. Majority of cases were from affected area as compared to rehabilitated area also males were suffered more as compared to females(Table 2)

There were total 14 cases of hepatitis reported within two year. Out of this 71% were from affected area and 29% were from rehabilitated area. Out of 14 cases of hepatitis 71% were male and 29% were females. Majority of hepatitis cases from affected area this data is subjected to statistical analysis the difference is found statistically not significant [Fishers test P = 0.689 (one sided)] (Table 2)

DISCUSSION

There were total 2144 cases of diarrhea reported within two year. Out of this 73% were from affected area and 27% are from rehabilitated area. Out of 2144 cases of diarrhea 57% were male and 43% were females. Majority of diarrhea cases from affected area, this data is subjected to statistical analysis the difference is found statistically significant (X2 = 3.191 d.f = 1 P = 0.0370 (one sided)). There were total 706 cases of dysentery reported within two year. Out of this 86% were from affected area and 14% were from rehabilitated area. Out of 706 cases of dysentery 61% were ma $_i$ le and 39% were females. Majority of dysentery cases from affected area. This data s subjected to statistical analysis the difference is found statistically significant [X = 3.944 df = 1 P = 0.0235 (one sided)]. There were total 22 cases of Enteric fever reported within two year. Out of this 77% were from affected area and 23% were from rehabilitated area. Out of 22 cases of Enteric 68% were male and 31% were females. Majority of Enteric fever cases from affected area this data is subjected to statistical analysis the difference is found statistically not significant [Fishers test P =0.4769 (one sided)].

There were total 15 cases of STD reported within two year. Out of this 60% were from affected area and 40% were from rehabilitated area. Out of 15 cases of STD 60% were male and 40% were females. Majority of STD cases from affected area this data is subjected to statistical analysis the difference is found statistically not significant (Fishers P = 0.5455 (one sided). Out of this77% were from affected area and 23% were from rehabilitated area. Out of 13 cases of Leprosy 52% were male and 38% were females. Majority Leprosy cases from affected area this data is subjected to statistical analysis the difference is found statistically not significant (Fishers P = 0.6853 (one sided). There were total 42 cases of Pneumonia reported within two year. Out of this 71% were from affected area and29% were from rehabilitated area. Out

of 42 cases of Pneumonia 60% were male and 40% were females. Majority Pneumonia cases from affected area this data is subjected to statistical analysis the difference is found statistically not significant (Fishers P= 0.5941).

There were total 484 cases of scabies; reported within two year. Out of this 77% were from affected area and 23% were from rehabilitated area. Out of 484 cases of Scabies 60% were male and 40% were females. Majority Scabies cases from affected area this data is subjected to statistical analysis the difference was found statistically not significant ((X^2 = 0.119682, DF =1, P < 0.5). There were total 26 cases of Malaria out of this 88% were above 5 years of age and 12% were below 5 years of age. Out of 26 cases Malaria 69% were from affected area 31% were from rehabilitated area it means majority of cases were from affected area. This data is subjected to statistical analysis the difference is found statistically not significant Fishers Test, p=0.6862 (one sided).

There were total 57 cases of pulmonary tuberculosis out of this 86% were above 5 years of age and 14% were below 5 years of age. Out of 57 cases pulmonary tuberculosis 81% were from affected area 19% were from rehabilitated area it means majority of cases were from affected area this data is subjected to statistical analysis the difference is found statistically not significant Fishers test p=0.5142 (one sided). There were total 13 cases of Leprosy out of this 85% were above 5 years of age and 15% were below 5 years of age. Out 13 cases Leprosy 77% were from affected area 23% were from rehabilitated area it means majority of cases were from affected area by Sardar Sarovar dam in Nandurbar district. This data is subjected to statistical analysis the difference is found statistically not significant There were total 36 cases of Pneumonia out of this 53% were above 5 years of age and 47% were below 5 years of age. Out 36 cases Pneumonia 63% were from affected area 37% were from rehabilitated area it means majority of cases were from affected area by Sardar Sarovar dam in Nandurbar district. This data is subjected to statistical analysis the difference is found statistically not significant (Fishers test, p=0.6340 (one sided).

There were total 872 cases of malnutrition reported within two year. Out of this 85% were from >1 yrs of age group and 15% were from below one year of age group. Out of 872 cases of malnutrition 44% were Male and 56% were females. Majority of malnutrition Cases were from >1 yrs of age group as compared to the below one years of age group, this data is subjected to statistical analysis the difference is found statistically not significant (X^2 =0.25602 df. =1 P < 0.5). Number of cases of diarrhea increases from June to October, this might be due to rainy season and cases started decreasing from November to April. Number of cases of dysentery increases from month June to October this might be due to rainy season. The cases started decreasing November onwards. Number of cases of Hepatitis increases from month of May to October. The cases were start decreasing November onwards. The maximum number of cases was in June, July.

Number of cases of Enteric Fever increases from month

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June to October. The cases were start decreasing November onwards. The maximum number of cases was in July. August, September. Number of cases of Malaria increases from month June to November this might be due to rainy season and the cases were start decreasing December onwards. Number of PV and P F cases of Malaria increasing from month June to November this might be due to rainy season and the cases were start decreasing from December onwards. The cases of PF.were increasing as compared to P.V.

Number of cases of Pneumonia increases from month July to December this might be due to winter season and the cases were start decreasing December onwards. Number of cases of Scabies increases from month October to January and the cases were start decreasing February onwards. Infant Mortality Rate in affected and Rehabilitated area in two years of study period. It is observed that in affected area IMR is 70 per thousand Live Births and in rehabilitated area it is 55 per thousand Live Births. So it is concluded that IMR is more in affected area as compared to the Rehabilitated area. Infant Mortality is less in rehabilitated area might be because of better health infrastructure which is providing quality of maternal and child health services in rehabilitated area which is lacking in affected area. SL Kate in their study observed that the infant mortality rate in tribal parts of Maharashtra was 110 as compared to other parts of Maharashtra which was 59.[8]

The Maternal Mortality Rate in affected and rehabilitated area in two years of study period. It is observed that in affected area MMR is 0.6 per thousand Live Births and in rehabilitated area it is 0.1 per thousand Live Births. So. It is concluded that MMR is more in affected area as compared to the Rehabilitated area. Maternal Mortality is less in rehabilitated area might child health of better health infrastructure which is of maternal and child health services in rehabilitated area which is providing quality lacking in affected area.

CONCLUSIONS

1. Strengthening of the existing health services and existing infrastructure in the affected and rehabilitated area.
2. Active involvement of local leaders with some incentives (Pada worker, ASHA). NGOs and CBOs in diseases surveillance system.
3. Regular training of local leaders for regular reporting in uniform format from both affected as well as rehabilitated area regarding diseases surveillance.
4. Appointment of full time entomologists to regular Entomological surveillance affected area.
5. Regular re-orientation training Programme for health workers both affected as well as rehabilitated area.
6. Establish laboratory services with trained Laboratory technician at every primary health center as well as in floating dispensary with all necessary equipment and logistic.
7. Active community participation and intersectorol coordination in implementation of anti-malarial programme & diarrheal disease control programme
8. Modified technique IEC and BCC activities as per felt needs to increased awareness in the community about VBDs and WBDs both affected as well as rehabilitated area through local leaders in their local language.
9. Continuous research regarding the species of vectors and its control technique
10. Physical, Chemical and Biological Intervention should be strengthened in both affected as well as rehabilitated area.
11. Uninterrupted water supply of drinking water and regular chlorination of drinking water in remote area.

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