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Research Paper

PHYSICO-CHEMICAL ANALYSIS OF DRINKING WATER IN JALGAON (JAMOD) TEHSIL (MS) INDIA WITH SPECIAL REFERENCE TO POSSIBLE EFFECT ON KIDNEY

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Abstract

Waterborne diseases are caused by the poor and contaminated water that are possible to cause threats to human lives. So, we focused on this important topic which is related to human health. Here, it is recorded that number of villages in Jalgaon (Jamod) tehsil face kidney problems. Most noticeable factor is that, ground water contain high amount of magnesium, chloride and electrical conductivity is also found to be high in this potable water. The biggest water pollutants are heavy metals, nitrate, arsenic, fluoride and synthetic chemical emissions especially due to industrialization(4,6 &12). The Quality of drinking water has a major influence on public health and prolong exposure to contaminated water has been known to increase the risks of cancer and disorders in kidney, liver and reproductive organs, etc.

Key words: Drinking water, physico-chemical parameters, potassium, magnesium, kidney, dysfunction and Jalgaon Jamod etc.

INTRODUCTION

Water is in an invaluable natural resource. It is used for drinking, irrigation, producing electricity, transporting merchandise and producing food. It also sustains many diverse and ecologically important species but contamination of water resources by naturally occurring phenomena or chemical wastes due to rapid industrial growth and urbanization is one of the major ecological concerns of the contemporary world.

The biggest water pollutants are heavy metals, nitrate, arsenic, fluoride and synthetic chemical emissions especially due to industrialization[4,12]and also the quality of drinking water has a major influence on public health and prolong exposure

to contaminated water has been known to increase the risks of cancer and disorders in kidney, liver and reproductive organs, etc.[3]

The effect of chemical contaminations in drinking water on human being is found to be chronic rather than acute. Therefore, understanding of water quality on public health is vital because waterborne diseases are still a major cause of death in many parts of the world [11,16]and also, investigated the synergic effectof heavy metals, aluminium, arsenic, fluoride and hardness in drinking water on kidney tissues of mice.[10]

Therefore, present investigation on analysis of drinking water and blood sample has been undertaken on patients suffering from kidney dysfunction. in Sangrampur tehsil located in Vidarbha region of Maharashtra, India. In this region main sources of water are well, borewell, river and small dam but quality of this water are poor and possible effect on kidney dysfunction of population in Sangrampur because people know about the recommended WHO water quality standards are only a guideline and cannot be considered as the safe level of contaminants, especially in this areas so this work is helpful in respect of awareness of possible effect of poor quality water and its effect on blood and kidney dysfunction.

MATERIALS AND METHODS

Water samples were collected in sterilized sampling bottle from different villages at different site but our main focus on the dams, rivers, ponds, hand pumps and wells nearby the human locality of Jamod Jalgaon tehsil located in Buldhana district Maharashtra state, India.

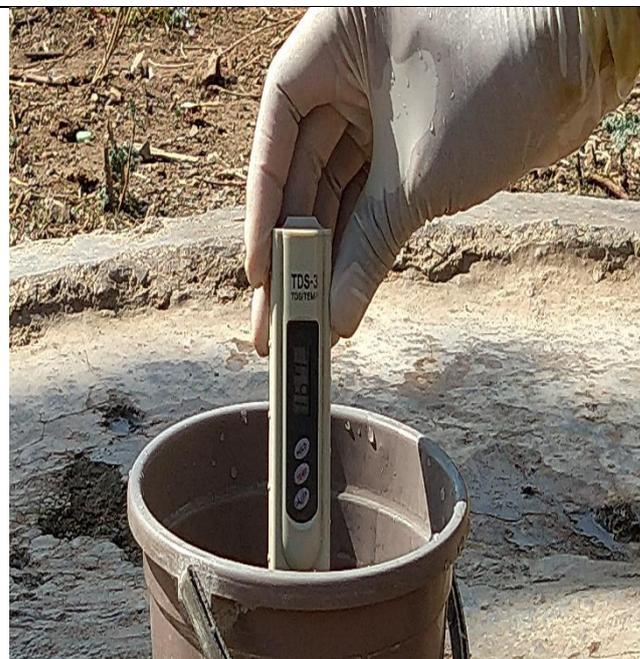
Water samples were analysed for different physico-chemical parameters as per previously modified methods used are as following

The temperature of water was measured immediately on site of water body by using glass thermometer. pH of water sample also measured on site with help of digital pH meter and then in laboratory with help of deluxe PH meter-101 Model, Conductivity was measured by conductivity meter EQ 660B μp Based model. Turbidity of the water samples were measured using a turbidity meter, Alkalinity was determined by Titration Method, TDS (mg/L) measured by TDS meter and hardness and chloride were

determined by titration method and also remaining parameters measured and determined.(NEERI, Govt.of India)and also, calcium, sodium, magnesium and chloride measured by Titrimetric method used by [9]



Photograph1. During Borewell water sample collection

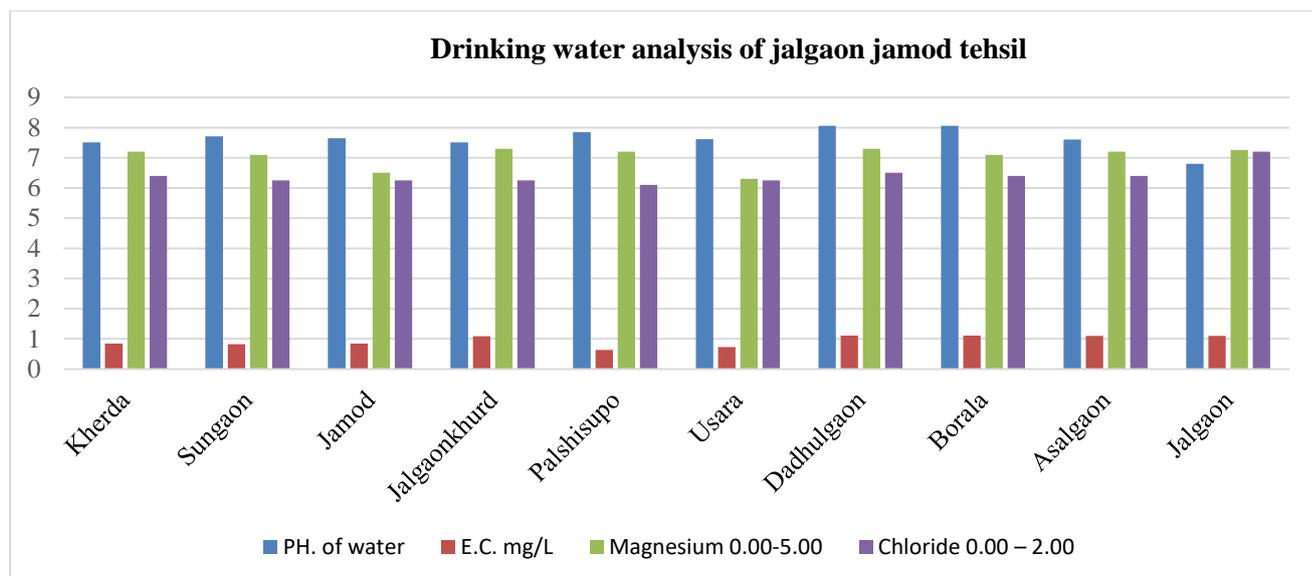


Photograph2. during Measurement of TDS of Water sample

RESULTS AND DISCUSSION

Table 1: Test reports of water from Jalgaon Jamod tehsil: -

Name of village	PH. of water	E.C. mg/L	Magnesium mg/500ml Water	Chloride mg/500 ml Water
Kherda	7.51	0.85	7.20	6.40
Sungaon	7.71	0.82	7.10	6.25
Jamod	7.65	0.85	6.50	6.25
Jalgaonkhurd	7.51	1.09	7.30	6.25
Palshisupo	7.85	0.63	7.20	6.10
Usara	7.62	0.73	6.30	6.25
Dadhulgaon	8.06	1.11	7.30	6.50
Borala	8.06	1.11	7.10	6.40
Asalgaon	7.60	1.10	7.20	6.40
Jalgaon	6.80	1.10	7.25	7.20



During present investigation of water samples collected from different location of Jalgaon (Jamod) tahesil, showed that the P^H from 7 villages ranges from 7.51 -7.85 P^H , while 2 villages recorded with highest P^H 8.06 and another one with minimum P^H 6.80. Here, Dadhulgaon and Borala having the highest P^H . While, Lowest p^H level recorded in Bhilkhed. The P^H of most drinking-water lies within the range 6.5–8.5.

Water samples from 5 villages shows E.C. of very high range i.e. 1.09-1.11; 3 villages with 0.82-0.85 and remaining 2 villages recorded E.C. with 0.63-0.73. Higest EC level were recorded in villages Dadhulgaon, Borala, Asalgaon and Jalgaon. While, Lowest EC level was recorded in Palshisupo villages.

The Magnesium content ranging from 7.10-7.30ppm was recorded for 8 villages and in 2 villages a range 6.3-6.50ppm was noticed 5 villages shows Chloride content ranging from 6.10-6.25, 4 recorded a range of 6.40-6.50 and one village i.e. Jalgaon (Jamod) were recorded with 7.20. it should be more sincerely notedbecausejalgaon (Jamod) being a tahesil place. drinking water standards require chloride levels not exceeding 250 mg/l.

Water is essential not only for proper bodily functions and hydration but also for survival of living beings. Drinking water needs to be clean and safe (potable) and is essential for protecting health and the survival of humansConsumption of water that is contaminated, whether with microbes, biotoxins or chemicals, will lead to ill health and, may cause premature death.[15]

Geochemical changes in the groundwater of arid regions prone to kidney diseases, with subtle changes in the ratios involving Ca, Mg, F, and phosphate ions. Consideration of Ca-hardness, Mg-hardness and temporary hardness is more important than total hardness when correlating disease patterns with geochemical parameters.[6] Also, A recent study carried out in a CKDu prevalent village in Vavuniya in which the water samples were collected from wells used by families with CKDu patients and healthy families[13], indicated that the groundwater hardness in the study village varied from 88 to 352 mg/L in CKDu wells, while in non-CKDu wells were 120 to 556 mg/L. Therefore, high hardness is common in the areas under investigation. However, the mean Mg²⁺ in drinking water wells of CKDu and non-CKDu groups were 12 and 26 mg/L respectively with the fluoride concentration in all studied samples ranging from 0.23 to 1.37 mg/L with a mean value of 0.82 mg/L. It was observed that 72% of the samples had fluoride above 0.6 mg/L recommended for tropical countries [14].

More than 85% people in the CK Du affected areas consume water directly from wells, where the phosphate contents are negligible [5,7]. And also, the preventive approach to calcium nephrolithiasis, intake of soft water has been preferable to hard water since it is associated with a lower risk for recurrence of calcium stones [2].

CONCLUSION

Result of investigation show that quality of drinking water has positive correlation with kidney function. The studies of physico-chemical parameter indicate the poor quality of drinking water in the area that needs purification to prevent kidney dysfunction. Such studies will be helpful to create awareness amongst people of the area and the system providing drinking water to the society. Student and researchers will also be benefitted from such studies who are working on the concerned topic.

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