SUGGESTIVE METHOD TO CONTROL SALMONELLOSIS
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In the present study the drinking water raw milk and vegetable samples were tested for the presence of *Salmonella* species along with indicator of faecal contaminations. The results revealed, the considerably high frequency for the prevalence of both the organisms. It may be due to the subquality environmental sanitation, particularly improper water and wastewater management, solid waste disposal etc. at Akola. Water may be the major factor in contamination of raw milk and vegetables.

Hence, Akola Municipal Corporation should launch a water supply scheme with highest quality as well as priority. Public reservoirs of water, particularly where the water should be stored viz.; schools, colleges, hospitals, bus stand and railway station should regularly monitored and disinfected for the safety every day. Post disinfection monitoring for treated water is recommended time to time.

There is need of strict visualization of food sanitation according to food and drugs rules. The food and milk samples showed high frequency of *Salmonella* and *E. coli* in vegetables and milk analysed from hotels of Akola. This might be the factor with high risk to induce an epidemic outbreak of Salmonellosis in Akola. It has been observed that the vegetable markets are not maintained well. There are enumerable fly breeding places, dunghills by roadsides. It was also observed that there are large numbers of hawkers, selling
food indiscriminately which creates umpteen opportunities for the food and milk to be contaminated. The food handlers and cooks in hotels have no concept of personal hygiene, hence many of the infections must be starting from the hotels. Secondly the hotels and eating places with a congested kitchens are very dirty and unhygienic.

Hence, the health sanitation section of the municipal corporation and food and drug department should taken strict measures to improve the hygiene of the hotels and vegetable markets of Akola. The carriers in food handlers need to be investigated systematically and treated specifically by appropriate medical experts. Carrier detection camps should be organised by Government Hospitals. The recommendation of present study will not only be beneficial in controlling Salmonellosis but also it will be helpful to control all existing water and food borne diseases at Akola. There is a need to organised the orientation workshops on concept of personal hygiene. Such orientation programmes in coordination with microbiologist will be more beneficial in controlling the diseases by upgrading the hygienic standards in Akola.

It was observed that the frequency of Salmonella and E. coli positive samples was consistent through out the year in almost all the samples. It may be due to the long term survival ability of Salmonella in the environment or there may be regular source of water pollution.

Hence, permanently a great deal of attention, especially as concerns to improvement and sophistication of the available detection methods is necessary. Even though the studies are not elucidated on the average
survival and virulence persistence of pathogen. It is very important to pay an attention on the survival and virulence potential of the pathogens in the outdoor environment which will be helpful to design the perfect control policies.

As per the notification on the *Salmonellosis* obtained from Government and Private medical practitioners, it was revealed that in almost all the months the patients of enteric fever were recognised however, from July to September specially in rainy season of Akola the percentage of patients diagnosed were more. It was also observed that the percentage of notified cases are more in Private hospitals as compared to Government hospital specially those they use to go at Government hospital or it might be possible that the toxicity of the cases makes them go to private hospitals and nursing homes. Even though the hospital and drugs charges are very heavy.

Clinical data also reveals that the frequency of enteric fever cases is high among the school going children below 10 years age group whereas, in male to female ratio in all age groups, males are more victimized to *Salmonellosis* in Akola. Among the diagnostic measures predominantly the Widal test is utilized however, the other measures like blood cultures, stool cultures and urine cultures are restricted only to certain laboratories. High cost of cultures and time factor required for diagnosis might be the constrain for the diagnosis. Hence with the view to control the incidences especially of *Salmonellosis* in Akola.

The local health authority should make typhoid vaccination available every year compulsory for every school from Nursery to High School. If immunization camps are arranged from one month prior and latter to rainy
season, every year then typhoid vaccine may get available to any one at any time. The food handlers and workers in hotels and restaurants should be compulsory vaccination at free of cost. If the special *Salmonellosis* project for surveillance of sources of infection, mode of transmission and vaccinations should be started. The same project should be used to monitor the regular supply of anti-*Salmonellosis* drugs.

During the present study total nine *Salmonella* strains were isolated from Akola and subjected for antibiotic resistance studies. The results reveals that all the isolates were sensitive to Ciprofloxacin and Norfloxacin. However, Chloramphenicol, Tetracyclin, Ampicillin, and Streptomycin resistance were more frequently observed among all the *Salmonella* isolates. The present investigation concludes that the drug resistance can be developed in *Salmonella*. This may be due to the uncontrolled use of antibiotics without confirming the antibiotic resistant patter of infecting *Salmonella species* which, ultimately lead to invivo sublethal doses that results into a development of drug resistance to the antibiotic in practice during therapy. It is also possible that the organism should show resistance to structurally related antibiotic to which the organism had acquired the resistance previously during therapy. If such conditions persist in the medical practice in Akola, there may be an outbreak of multidrug resistance *Salmonella* infection in the future.

Hence, to prevent the drug resistance problem among the *Salmonella* and to protect the community from multidrug resistance *Salmonella* outbreak. There should be proper co-ordination between the clinical practitioners and laboratory investigation especially there is an urgent need to
investigate antimicrobial susceptibility testing before treatment otherwise, seriously ill patients will be endangered. Simultaneously medical professionals should obey their prescribed drugs till the completion of entire treatment. Then it might be possible to control the development of drug resistance. In India it was frequently observed that drugs are sold without medical prescription. Such practices are exposing the pathogens to sublethal concentrations of the drugs. It might have resulted into a development of drug resistance in microbes.

Hence the local food and drug administrative authorities should keep time to time vigilance to avoid the sale of drugs without prescription, which will be helpful to avoid the development of drug resistance induced by exposing Salmonella species to sublethal drug concentrations.

The results on the chlorine sensitivity reveal that Salmonella species may acquired the resistance against germicidal action of chlorine. It may be due to mutations in the R-plasmids which confers the multiple drug resistance. However, the results can be confirmed only after the screening of mutational changes in plasmids on molecular levels. Even though no reports could be traced on chlorine resistant strain of Salmonella, the possibility of resistance cannot be ignored on such findings. So as to ensure the potability of drinking water.

From the above discussion and the present investigations it is clear that Salmonellosis is a quite serious problem in developing countries like India and is too serious problem in less developed area like Vidarbha in general and Akola especially. Special attention must be given for control measures of typhoid and related diseases. Control measures should be of two
types i.e. long term control measures and short term control measures.

Execution of the control measures should be done jointly by Government organization, Municipal Corporation and non-government organizations. Since the government organization and municipal corporation have their own limitations non-government organization can have an upper hand in controlling this infection, as they are the link between the government and the community. Health and hygiene education is an important aspect to control such health related problems. Health education can be done by formal and informal methods of education. Prints and electronic media will cover this aspect to a great extent. School and college teachers and the students to cover a large portion of our community can do a massive program of health education. Thus, in the coming future with the help of constructive efforts of government organization, municipal committees and corporations may have a great control on such communicable diseases. Non-government organizations with their special programs may change the entire scenario leading to the healthy environment free from all communicable diseases. Thus, a healthy citizen leads to a healthy country.