Primary study on Diarrhea prevalence in the Ahmedabad region of Gujarat state, India

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ABSTRACT

Background: Diarrhea is one of the most common and fatal disease. It mainly affects the children who are below the age of five years. Till the date most of the study have focused on children, very rare analysis for adult is been done. Aim: In this study, a preliminary study on diarrheal incidents in the Ahmedabad was carried out. The prime objective of this study is to analyze various parameters associated with the disease diarrhea. Methods: Various physiological and clinical factors associated with diarrhea were considered for the study. Patients were analyzed based on their gender, age, WBC count, root cause of disease, source of contamination and type of microbes associate with disease. Obtained data were analyzed using SPSS statistical software. Analyzed data were discussed with the other similar studies. Results: From the study it was found that most of the diarrhea incidences were taken place because of infection of streptococcus or staphylococcus species. This infection has increased the total WBC count in the blood. However, fetal issue was not observed in adult.

1. Introduction

In the world several disease are known to fetal for human being. Diarrhea is one of such disease. It can affect the human of any age group. However the mortality rate very high the children as there are most susceptible for the disease. In case of adults the mortality rate is comparatively very low. Globally, children of developing countries like India, Pakistan, Nigeria etc are more prone to diarrhea as compared to the developed country. In a survey it was found that in various countries Africa, Latin America and Asia around five to six million children below the age of 5 die due to diarrhea in a year. This study has also revealed that 80.0% of children die under the age of 2 years. In the developing countries, principle reason for death of children is due severe dehydration which results into significant loss of water and salt from the body. Since water and salt concentration plays a significant role in the normal metabolic activities it is very essential to have these components in sufficient concentration in the body otherwise it will alter the metabolic pathways of the body and may result into death. Diarrhea can be defined as the disturbance of the digestion tract which results into changes in motility and absorption causing increase stool volume and change in consistency. In watery diarrhea, stool contains unusual higher volume of water. Many times stool is often found contaminated with blood, mucus or microbes. Microbes present in the stool may help in finding out cause of infection. Diarrhea may be classified in various categories depending on the time duration of infection, quantity of stool and type of stool. Generally more than three times passage of stool within a day is refereed as diarrhea (normal diarrhea). If the diarrhea persist for less than 2 weeks then it can be classified as acute diarrhea but if the time duration extend beyond two weeks than it should refereed as persistent diarrhea.

Diarrhea are generally caused by various agents like bacteria, virus and parasites, food indigestion, medicine reaction etc. There are various roots of transmission of diarrheal agents into the most. Most common route of transmission is oral infection. Other routes involve consumption of contaminated water and food, person to person contact, and direct contact with fecal matter.

Ahmedabad is the largest city of the state Gujarat. It has total 464 km² area. It has a total population of around 55.7 lakhs. Ahmedabad is also known as an industrial hub for the state of Gujarat. It has wide spreaded business related to pharma, real estate, food, cotton and many more. Agriculture and animal husbandry are major sources of income for the people of Ahmedabad rural area. Because of improper cleanliness and sanitation certain areas has affected the people with various disease including diarrhea. So we have carried a preliminary analysis on the prevalence of diarrhea in the region.

2. Material and Methods

Based on the medical prescription, we have selected 104 patients (n=104) coming to the pathology laboratory for various analyses. Out of these 104, 52 patients were male and 52 patients were female. We have collected basic details like age, gender, weight, month of infection etc from the patient through verbal communication. Clinical parameters like total WBC count, hemoglobin content and presence of microorganism were carried out using standard clinical procedure. Hemoglobin content was analyzed using Sahli’s method and where ever possible with automated hemoanalyzer. In the detail procedure of hemoglobin estimation, Hb square tube was filled upto mark 20% with 0.1 N HCl. Then Hb pipette was filled with the blood upto 20 microliter. Excess blood was removed with wet gauze. Hb pipette was emptied into the acid in the square tube and rinsed thrice by drawing in and discharging the blood acid mixture. Care was taken prevent air bubble formation in acid hematin mixture. Acid-hematin mixture in the tube was allowed to stand for 20 minutes after vigorous mixing. After incubation the solution was diluted by adding distilled water drop by drop.
and stirred the mixture with glass rod. The comparator was held against good day light and distilled water was added till the colour of the solution matched perfectly with that of standards. Reading was recorded. Apparatus was cleaned after its use for reuse. The hemoglobin pipette was cleaned by sucking and then expelling water several times. For determination of total WBC count again hemocytometer was used. Neubauer’s chamber was used for manual counting of WBC. In the detail procedure Patients’ figure for sterilized using alcohol swab and blood was drawn with the help of sterile needle. Blood was directly collected in the WBC pipette and filled upto a specific mark. Then the WBC pipette was filled with the diluents fluid and allowed to stand for 10 minutes. In the meantime the hemocytometer and cover slip was cleaned using alcohol and sterile tissue paper. After 10 minutes, the diluents contain WBC were charged in the hemocytometer slide with the help of WBC pipette. The hemocytometer slide was allowed to settle for some time before mounting on to the microscope. After sometime the WBC were counted in a specific manner. From the average count the total number of WBC was count. For microbial analysis of stool various specialized media were used line MacConkey’s media, blue green agar, peptone water etc. Microbes were identified based on the colony morphology. The collected data were analyzed using SPSS statistical software and obtained results were discussed in detail.

3. Results and Discussion

Total 104 patients were taken in to consideration for this study. Patients were initially classified as male (52) and female (52). When the age group was analyzed most of them were found to be over 40 yrs. Incidence of diarrhea were found highest in the age group of 60-70 yrs in both the gender (Fig. 1). This may be because of weakening of immunity due to age factor. Apart from this, slower recovery and delay body response to the drugs are also an added disadvantage.20,21 Most of the studies which have been carried out for diarrhea, they have target group of children which are below the age of five years.7,22-24 Very less number of studies was carried out for adult patients. From the studies it was found that children are more susceptible for the diarrhea may be fetal for them especially infants or those who are less than 1 year. However, rate of infection is also high in the children up to the age of 8 - 10 years, but the mortality rate is very less. When blood samples of these patients were analyzed for total WBC count 81 patients have shown higher count whereas the rest were at the top most limit of WBC count which is between 4,000 – 10,000 cells. This indicates they must be suffering of some
kind of infection (Fig. 2). Generally the counts of WBC are directly related with intensity of the infection. Here the maximum count was around 12,000 which indicate moderately higher level of infection. In many cases in was observed that the count reaches upto 15,000 to 20,000. It was also found that the increase or decrease of count is also related with the type of microbes associate with the disease. Results of hemoglobin content have shown that 66 patient are having lower hemoglobin content. Rest 38 patients were having normal hemoglobin content. (Fig 3.) Upon microbial analysis it was found that most of the patients were suffering from streptococcus or staphylococcus infection (Fig. 4). Among all microbes associate with the disease. 

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