

# STOOL CULTURE ISOLATES OF PATIENTS WITH CHRONIC DIARRHEA ADMITTED AT A PRIVATE HOSPITAL FROM 1992-2002

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## ABSTRACT

Chronic diarrhea can be a disabling illness and reduce the quality of a patient's life. In developing country like ours the most common cause of chronic diarrhea is infectious in origin and malnutrition is noted in 80% of patients.

**Objectives:** To identify the commonly isolated organism from stool culture of patients with chronic diarrhea admitted at a private institution from July 1992-July 2002.

**Methodology:** Review of charts of 23 patients with diarrhea for more than 2 weeks evaluated by history, Physical examination and aided with laboratory examination.

**Results:** The evidence of chronic diarrhea clustered around the 1st year of life and most of the population were males, 65-78% of the populations have height and weight appropriate for age. The most common cause of chronic diarrhea was infectious in origin and *E. coli* was the most common organism isolated from stool culture of these patients. 100% of *E. coli* isolated were sensitive to Amikacin. Other causes of chronic diarrhea were lactose intolerance, cow's milk allergy and malabsorption. In malnourished children *E. coli* population increase during or following an infection and it is the enteroadherent type which predominates.

**Recommendation:** Thorough history and physical examination is important in arriving at a diagnosis. With a very small sample size we can extend the study to 20-30 years and concentrate on severely wasted patients with chronic diarrhea and to see if there is correlation to development of severe wasting if the growth is *E aerogenes*.

## INTRODUCTION

Diarrhea has been once of the major health problems in developing countries like ours and also one of the common complaints of patients seen by pediatrician. It was reported that diarrhea has been the second leading cause of morbidity and also second most commonly reported notifiable disease<sup>1</sup>. It can be a frustrating management problem to both family and professionals. Another aspect to consider very seriously is that it leads to malnutrition and infection in the immunocompromised host.

Chronic diarrhea can be a disabling illness and reduce the quality of life of the patient. The prevalence of chronic diarrhea in children worldwide ranges from 3-20%<sup>2</sup>. In the Philippines a 10% incidence of chronic diarrhea have been reported 50% of diarrhea associated death worldwide is attributed to chronic diarrhea<sup>3</sup>. The main causes of chronic diarrhea seem to depend on the socio-economic status. In developing countries like ours chronic bacterial, mycobacterial and parasitic infections are the most common causes of chronic diarrhea. Malnutrition maybe observed in 80% of patients<sup>4</sup>.

Chronic diarrhea is defined as increased daily stool output (3 times perday) associated with increased in the water content for duration of 2 weeks. Different laboratory examinations are needed for the diagnosis and identification of the causes of chronic diarrhea. Not to forget is the importance of a complete history and physical examination to aid in the diagnosis. Although bacterial infections are rarely the cause of chronic diarrhea in immunocompetent patients, stool culture should be performed for the evaluation of these patients especially in our country since previous studies point to infectious and parasitic origin as one of the common causes in chronic diarrhea.

## GENERAL OBJECTIVE

To identify the commonly isolated organisms from stool culture of patients with chronic diarrhea admitted at a tertiary hospital from 1992-2002.

## SPECIFIC OBJECTIVES

- To present a demographic profile of patients with chronic diarrhea as to sex, age and nutritional status
- To identify the bacterial isolates from patients with chronic diarrhea
- To identify the organism isolated from stool culture and the degree of nutrition of the patient to which the organisms were isolated from
- To determine the antimicrobial susceptibility pattern of the organisms isolated

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## METHODOLOGY

This study was done in a private hospital during the period of July 1992-July 2002. A review of charts of twenty three patient with diarrhea for more than 2 weeks were evaluated by history, physical examination and laboratory exams which included stool exam, stool culture, CBC, test for reducing sugars and stool pH.

## STUDY DESIGN

Descriptive retrospective study

## RESULTS

Table 1. Sex Distribution

Male	17	75%
Female	6	26%
Total	23	100%

Table 2. Age Distribution

1 month - 1 year	17	74%
2 - 3 years	3	13%
4 - 5 years	1	4.3%
6 - 9 years	1	4.3%
10 - 19 years	1	4.3%

Shown in Table 1 and 2 are the age and sex distribution of the subjects. The incidence of chronic diarrhea has clustered around the first year of life and mostly are males.

Table 3. Nutritional Status

Wasting	%	Stunting	%
Normal	15	18	78%
Mild	3	3	13%
Moderate	3	2	9%
Severe	2	0	0%

This table shows that 65-78% of the population has height and weight appropriate for age. This is followed by 13% of mild and moderately wasted patients and 9% severely wasted subjects. Mildly stunted subjects account for 13% of the population and 9% moderately stunted. In the study done by Altuntas, et al malnutrition was detected in 80% of cases with chronic diarrhea. Malnutrition is a frustrating sequelae of chronic diarrhea, however, majority of the subjects studied have height and weight appropriate for age.

Table 3 shows causes of chronic diarrhea at a

Table 4. Causes of Chronic Diarrhea

Infectious	14	69.9%
Cow's milk allergy	4	17.4%
Malabsorption	3	13%
Lactose intolerance	2	8.7%
Total	23	100%

Table 5. Stool culture isolates

<i>E. coli</i>	11	61%
<i>E. aerogenes</i>	2	11%
<i>Arizona P</i>	2	11%
<i>Citrobacter</i>	2	11%
<i>Proteus vulgaris</i>	1	6%

tertiary hospital. Of the total population studied 60.9% had infectious cause followed by cow's milk allergy, malabsorption and lactose intolerance. Subjects with infectious causes yielded 2 or 3 isolates from their stool culture. *E. coli* was noted to be the most common organism which account for 61% followed by *E. aerogenes* (11%), *Arizona sp* (11%), *Citrobacter* (11%) and *Proteus vulgaris* (6%). *E. coli* is a normal pathogen in the lower part of the colon but when they reached other sites they can cause infection. In malnourished children *E. coli* population increased during or following infection. In the study done by Perla D. Santos Ocampo it was found that it is not the enterotoxigenic nor enteroinvasive type of *E. coli* that is usually found and isolated but of the enteroadherent type of *E. coli* particularly the aggregative and diffuse adhering type.

This table shows the organism isolated and the

Table 6. Bacterial Isolates from patients with chronic diarrhea in different degree of nutrition based on the weight for age.

	Wasting	Number	Percentage
Mild	<i>Arizona sp.</i>	1	25%
	<i>Proteus vulgaris</i>	1	25%
	<i>E. coli</i>	2	50%
Moderate	<i>E. coli</i>	3	100%
Severe	<i>E. aerogenes</i>	2	100%
Normal	<i>E. coli</i>	6	67%
	<i>Citrobacter</i>	2	22%
	<i>Arizona</i>	1	11%

degree of nutrition of the patient to which the organisms were isolated from. In patients with appropriate weight for age the most common organism isolated was *E. coli* followed by *Citrobacter*. It was observed that only one organism was isolated from patients with severe wasting and that is *E. aerogenes*. *Enterobacter sp* inhabit the soil and water and to a lesser extent the large intestine of man and animal. Most infections occur in patients with underlying problems many of which are nosocomial<sup>5</sup>.

This table shows the sensitivity and the

**Table 7. Sensitivity of *E. coli***

Sensitive			Resistant		
Antibiotics	Number	Percentage	Antibiotics	Number	Percentage
Amikacin	11	100	Cotrimoxazole	9	82
Gentamicin	7	64	Chloramphenicol	4	36
Cefuroxime	5	45	Nalidixic	3	27
Nalidixic	4	36	Cefalexin	4	36
Chloramphenicol	2	18	Ampicillin	7	64
Ceftaxidime	4	36	Amoxicillin	8	72
Netilmycin	3	27	Gentamicin	2	18
Cefaclor	3	27			

resistance of *E. coli* to the different antibiotics. Of the antibiotics tested it was seen that 100% of *E. coli* isolated were sensitive to Amikacin followed by Gentamicin and Cefuroxime. Of the antibiotics used *E. coli* was most resistant to Cotrimoxazole, Amoxicillin and Ampicillin.

## DISCUSSION

We cannot over emphasize the importance of a thorough history taking and physical examination in diagnosing patients with chronic diarrhea. Findings from the patient's history and physical examination may point strongly to a particular diagnosis. In many cases, particularly those in which a partial evaluation has already been carried out without defining a diagnosis, quantitative stool reexamination is most often use for further evaluation. As what was stated in some of the journals reviewed, in developing countries the most common cause of chronic diarrhea is infectious in origin. We also found that the major cause of chronic diarrhea in our institution was infectious in origin and the most common organism identified was *E. coli*, followed by *E aerogenes*, *Arizona sp* and *Citrobacter* respectively. The incidences of chronic diarrhea clustered around the first year of life and mostly among males. In the study done by Altuntas, et al malnutrition was detected in

80% of cases with chronic diarrhea. Malnutrition is frustrating sequelae of chronic diarrhea. After gastroenteritis protein-energy malnutrition may follow with severe consequences in physical and developmental growth. However, majority of the subjects studies have height and weight appropriate for age. *E. coli* is a normal pathogen in the lower part of the colon but when they reached other sites they can cause infection. In malnourished children *E. coli* population increased during or following infection. In the study done by Santos Ocampo it was found that it is not the enterotoxigenic nor enteroinvasive type of *E. coli* that is usually found and isolated but of the eneroadherent type of *E. coli* particularly the aggregative and diffuse adhering type. Enteropathogenic *E. coli*, and vero-toxin producing *E. coli* produce nonfimbrial adhesion that attach the organism to their target cells. Once attachment to the host cell is established EPEC and EAEC produce modifications in the host cellular permeability leading to diarrhea. In patients with appropriate weight and height for age the most common organism was isolated from patients with severe wasting and that is *E. aerogenes*. *Enterobacter sp* inhabit the soil and water and to a lesser extent the large intestine of man and animal. *Enterobacter* are less isolated *Klebsiella* and *E. coli* they are capable of affecting any tissue of the body. Most infections occur in patients with underlying problems many of which are nosocomial<sup>5</sup>.

## CONCLUSION

A thorough history and physical examination is very important in establishing a diagnosis. Laboratory examination will further help us to the identification of the cause. Like in the diagnosis of chronic diarrhea complete history and physical examination will give us a hint that the cause is infectious or otherwise. The organism most likely to be isolated will be *E. coli* probably the enteroadherent type other organisms may include *Arizona sp*, *Citrobacter*, *Enterobacter* and *Proteus sp*. Other possible causes will be malabsorption, lactose intolerance and cow's milk allergy. The most likely age group to chronic diarrhea but in our institution most of our patients diagnosed with chronic diarrhea have normal nutritional status according to weight and height for age. In patients with appropriate weight and height for age we can still think of an infectious cause for the diarrhea like in our population, wherein majority of them belong to the normal status of nutrition and still we were able to isolate organisms like *E. coli*, *Citrobacter* and *Arizona sp*. Although fluid replacement is still the mainstay in the treatment of

diarrhea we can also give antimicrobial therapy especially in chronic cases. With *E. coli* as the most common isolate we can give Amikacin as one of the initial antimicrobials to be use until results of the stool culture is obtained.

### RECOMMENDATION

The diagnosis of chronic diarrhea may entail the patient to undergo numerous laboratory procedures, examination and questioning but we must always bear in mind that thorough history and physical examination is very important in establishing the possible cause of a disease.

Some of the journals reviewed showed that the major cause of chronic diarrhea in developing countries is still more of infectious in origin and based on the data

collected the most common cause of chronic diarrhea in our institution is infectious in origin. With this in mind we should always teach mothers to always practice proper hand washing especially after cleaning the babies. An ounce of prevention is better than a pound of cure".

With a very small sample size we can extend the study to 20-30 years and concentrate on severely wasted patients with chronic diarrhea and to see if there is correlation to development of severe wasting if the growth is *E aerogenes*.

Although fluid replacement is still the mainstay in the treatment of diarrhea we can also give antimicrobial therapy especially in chronic cases. With *E. coli* as the most common isolate we can give Amikacin as one of the initial antimicrobials to be use until results of the stool culture is obtained.

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