

ORIGINAL ARTICLE

AETIOLOGY OF DYSENTERY IN INFANTS IN INFECTION WARD OF AMIR KABIR HOSPITAL, ARAK, IN 2010–2011

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Background: Dysentery is one of the children's common disease for which various infectious and non-infectious reasons have been explained for it. Since determination of the cause especially with age segregation helps the experimental treatment, this study has been executed to establish relative frequency of dysentery causes and its comparison below and above the age of six months. **Methods:** This descriptive, sectional study has been executed on 50 below-six-month-old patients and 50 above-six-month-old patients both diagnosed with dysentery, held in the infection ward of Amir Kabir Hospital in 2010–2011. Faeces samples were taken for culture of *Shigella*, *Yersinia*, *Salmonella*, and *E. coli*, and serum samples were also taken for antibody against the *Campylobacter*, *Yersinia*, and allergy to cow milk protein; then results were analysed with SPSS. **Results:** In 60% of patients the cause could not be determined. In 12% of patients, faeces culture was positive, yet the positive faeces culture in two groups had no significant difference ($p=0.053$) 7% of antibody against *Yersinia*, and 14% against the *Campylobacter* was positive which was more significantly differed in above-six-month group than below-six-month group. Ten percent were allergic to the cow milk protein which was more significantly differed in above-six-month group than below-six-month group. **Conclusion:** In more than half of the cases the cause to dysentery could not be identified, but the infectious reasons for above-six-month were double the below-six-month group. *Campylobacter*, and cow milk allergy was more common in the six-month group, and the frequency of *Shigella* and other infections in both groups did not have a significant difference.

Keywords: *Campylobacter*, children, cow milk allergy, dysentery, *Shigella*

INTRODUCTION

Dysentery, appearing of blood and leukocyte in faeces along with stomach ache, tenesmus, and fever, is often caused by infections such as *Shigella*, *Salmonella*, *Campylobacter*, *Yersinia*, and *Amoeba*, although diseases like enteritis and allergy to cow milk are also among the dysentery causes.¹ The cause to dysentery can vary based upon the age and area.^{1,2} *Shigella*, *Salmonella*, and *Campylobacter* are most common causes to it.² In 70% of cases, *Shigella* has been observed in children below 5 years old, but below six months, it is rare for having mother's milk.¹ In one study, *Shigella* outbreak was found to be increasing.³

Age peak for *Campylobacter* is wither in early childhood or between 15–44 years of age, however, it can be seen in any age.⁴ Most infections caused by *Yersinia* have been observed in children below 7 years old, especially below one year old.¹ *E. coli* has been observed in children above 1 year age.¹

Enterocolitis and proctocolitis caused by allergy to cow milk usually occur in early months of life. Cow milk is the most common allergy among the infants.⁵ As age increases, the possibility of infection disappears.^{1,6}

If allergy to cow milk is not diagnosed and treated it can result in children's growth disorder.⁵ Various studies have been done to determine the cause of dysentery.^{2,6,10}

The cause remains unknown in half of the cases even with best lab equipment.² Still, bacterial causes must be investigated in the region to determine the antibiotic resistance in order to update the treatment. In addition, the causes of dysentery seem to vary for children above and below 6 months age. Allergy to cow milk is more common in this age range. This study aims to compare the causes of dysentery in two different age groups of above and below 6 months old for not so many studies have been executed based on age segregation.

MATERIAL AND METHODS

This descriptive, cross-sectional study has been executed on 50 below-six-month-old patients and 50 above-six-month-old patients, both diagnosed having dysentery, held in the infection ward of Amir Kabir Hospital, Arak, Iran. Children suffering from dysentery, not suspected to have intussusception, and not taking antibiotic before the experiment, were investigated. The faeces sample for culture of *Shigella*, *Salmonella*, and *E. coli*, and blood samples for investigation of *Campylobacter*, *Yersinia*, IgE, and allergy to cow milk protein were taken.

Patients' information was recorded on proforma, clinical symptoms, and experiment results were compiled, and the analysed by descriptive tests, using SPSS.

RESULTS

Out of 100 patients 44% were girls and 56% were boys. Out of 74 infants, 71 infants had mother's milk; 1 infant had powdered milk; and 2 infants had both.

Among the total of 100 patients, 41 had fever, 22 had dysentery also, and 17 patients had diarrhoea too. Twenty-five patients had only dysentery, and 34 patients had diarrhoea. Seven patients had recent trip experience; 1 patient had polluted food and drink; 1 patient had family record for the same disease; and 1 had record of contact with an affected person.

After faeces culture, 88% of cultures were negative. Ten percent patients were allergic to cow milk while 8 patients were above 6 months old, and two were below 6 months old, and the differences were significant ($p=0.0046$). Antibodies against *Yersinia* was present in 7% and 12% against *Campylobacter* were positive. Faeces culture of both groups did not have significant differences ($p=0.53$).

In 20% of patients above six months old and 4% of patients below 6 months old, antibody against *Campylobacter* was positive which had a significant difference ($p=0.014$). The results, based on age groups, have been illustrated in Table-1.

Table 1: Frequency of causes to dysentery segregated according to age in patients kept in infection ward

Aetiology	<6 month (n=50)	>6 month (n=50)	Total (n=100)	
Antibody against <i>Campylobacter</i>	2 (4%)	10 (20%)	12 (12%)	
Antibody against <i>Yersinia</i>	3 (6%)	4 (8%)	7 (7%)	
Allergy to cow milk protein	2 (4%)	8 (16%)	10 (10%)	
Faeces culture	<i>Shigella</i>	3 (6%)	4 (8%)	7 (7%)
	<i>Yersinia</i>	0 (0%)	1 (2%)	1 (1%)
	<i>Salmonella</i>	1 (2%)	1 (2%)	2 (2%)
	<i>E. coli</i>	2 (4%)	0 (0%)	2 (2%)
Unknown	37 (74%)	23 (46%)	60 (60%)	

DISCUSSION

In this study, in 2/3 of patients of below six month age, and almost half of those in other group, the cause to dysentery could not be identified. In a study by Pfeiffer, it was noted that even with best lab equipment, the cause to half of the cases of dysentery was unknown, and therefore more sensitive tests are needed.²

In 1/3 of total patients, infectious causes were positive for culture of *Shigella*, *Yersinia*, *Salmonella*, and *E. coli* in faeces or antibody against *Yersinia* and *Campylobacter*. These results for the above-six-month group were double the below-six-month group. Among the infectious causes, the most common reason in above-six-month group was *Campylobacter* followed by *Yersinia*.

Significant difference appeared only for *Campylobacter* for infection type, and this difference was distinctly more in above-six-month group. Other infections like *Shigella* did not have a significant

difference which was against the previous data in which *Shigella* was rare among the below-six-month group, but it was common between 1 and 4 years old which can be for having other foods rather than mother's milk.

In a study in Thailand, in investigation of aetiology of dysentery in the age range of 1 month to 12 years, in 55% of cases, the cause was unknown; 28% *Campylobacter*, 18% *Salmonella*, 9% *Shigella*, and 6% *E. coli* which is similar to this study. Yet, unlike this study where *Campylobacter* was more common among the six-month-old group, in the Thailand study the average age of *Campylobacter* was less than shigella.⁷ In a study in Tehran university 7.8% of cases of dysentery culture, *Campylobacter* grew which showed a less outbreak compared to this study. This difference can be for the difference of patients' age.

In a study in Zahedan investigating 155 children between 6 months and 6 years, *Shigella* was the most common cause which can be due to the difference in climate and not having *Campylobacter* investigated.¹⁰

In a study in Tabriz, in the faeces samples of children 0–12 years old, *Salmonella*, *Shigella*, and *Campylobacter* relatively were the common causes to dysentery. Also, *Campylobacter* was the most common in children below 2 years old which can be because of investigation of all types of diarrhoea.

In Soffi's study, age peak for *Shigella* and *Campylobacter* were both at the age of 2, although the disease caused by *Shigella* was more severe.¹²

In systematic investigation of Pfeiffer, the outbreak of *Shigella* was 23–37%, not attending the age and area, and *Campylobacter* was 18–42% as common causes of dysentery in the first year of life in developing countries.² However, in our study, *Shigella* was less frequent, and *Campylobacter* was more in ages above 6-month.

Allergy to cow milk protein was more common in the above-six-month group, and generally, in this group was the second most common cause after the campylobacter. In a study in Finland, allergy to cow milk protein has been reported 18%, and other causes were viruses and campylobacter. No case of *Shigella*, *Salmonella*, or *Yersinia* has been found.⁸ *Shigella*, *Yersinia*, and *Salmonella* were found in below-six-month group.

Ruvelli from Italy reported 16 children between 2 and 14 years old who were diagnosed with dysentery caused by cow milk protein, none of whom had the proctocolitis record in milking period.³ In our study, unlike expected, allergy to cow milk protein among children above 6 months old was more than those in other group.

Lucarellias reported 14 cases infants with proctocolitis symptoms, where exclusive IgE serum was negative, prick test was negative, but atopy patch was positive.¹⁴ This shows that negativity of exclusive IgE

cannot deny the possibility of allergy to cow milk protein. Therefore the low allergy in below-six-month children in our study might be because of non-sensitivity of this test, and one of our limitations in this study was the challenge test for cow-milk-protein-suspected cases which could have distinguished more patients.

CONCLUSION

In more than half of the cases the cause to dysentery could not be identified, but the infectious reasons for above-six-month were double the below-six-month group. *Campylobacter*, and cow milk allergy was more common in the six-month group. It is recommended to apply more sensitive tests to investigate dysentery, and execute the bacterial causes often to update the antibiotic treatment.

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