STUDY OF THE PREVALENCE OF DIARRHOEA IN CHILDREN UNDER THE AGE OF FIVE YEARS: IT'S ASSOCIATION WITH WASTING

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ABSTRACT

Diarrhoea emerges as the worldwide major cause of mortality in children under age of five years. Malnutrition and diarrhea together interplay to undermine the health of growing children in their prime years of life. Study comprised of total 440 children, selected through random multistage sampling method, guided by sample selection criteria, executed in city Fazilka, Punjab. The present study illustrated overall prevalence of (5.5%) diarrhea in children. Further, analysis depicted a high prevalence of (46%) diarrhea in children, who suffered from acute malnutrition (wasting), under the age of five years, accompanied by highly significant (p<0.001), association with wasting in children under the age of five years.

KEYWORDS: Under nutrition, Wasting, Diarrhoea, Acute malnutrition

Diarrhea is characterized by passing of three or more loose, watery stools per day. Acute diarrhea persists for one to two days. The tendency of passing well formed stools more than normal, is not diagnosed as diarrhoea, also the passing of loose, pasty stools in breastfed babies is not considered as diarrhea [NDDI; 2013].

In developing countries, children under the age of three years suffer from average three episodes of diarrhoea per year. Each episode worsens the nutritional status of the body necessary for growth and development of the children. Consequently, it is a major cause of malnutrition, and malnourished children are highly susceptible to further attacks of diarrhoea. Children who die from diarrhoea often have underlying malnutrition, which makes them more vulnerable to diarrhoea. Diarrhoea is a leading cause of malnutrition in children under five years old [WHO; 2013].

It is a manifestation of gastro-intestinal infection induced by bacteria, predominantly, E. coli, Salmonella, Para-Typhi, Shigella species. Infection is spread through contaminated food or drinking-water, or from person-to-person contact as a result of poor hygiene [Jill, et al.; 2010].

Diarrhoea is a prime cause of childhood mortality in the developing world. It deteriorates the immunity of children, specifically in the age group of two to three. Diarrhoea is responsible for worldwide mortality of 1.5 to 5 million children per year under the age of five years [Bern, et al.; 1992].

Diarrhoea undermines the resistance of body, coupled with dehydration and viciously depreciates the nutritional status of children under five [UNICEF; 2010].

AIM & OBJECTIVES

Aim

The present study had a goal to explore the prevalence of diarrhoea in children under the age of five years in the city Fazilka in Punjab.

Objectives

1. To find out the prevalence of diarrhea in under five year old children.
2. To assess the association of wasting and diarrhea in under five aged children.

MATERIALS & METHODS

Research Design

Observational, Descriptive and Cross-sectional research study was planned. It had following elements.

Sampling Design

Study Area

Study was carried in the city of Fazilka, Punjab. It is a city on Indo-Pak border in Punjab. As per census report of 2001, Fazilka has a population of 67,424, comprising 52% males and 48% females. In Fazilka, 13% of the population is under 6 years of age.

Sample Source and Sampling Units

Children below the age of five years, residing in and around Fazilka, Punjab, according to the inclusion and exclusion criteria, constituted the sample source and sampling units.
**Participant Selection Criteria**

**Inclusion Criteria**
1. Children between 2 years to below the age of five years.
2. All the children who were resident of Fazilka.

**Exclusion Criteria**
1. Children who were critically ill.
2. The children who were crying and agitated, did not participate in anthropometric measurements procedure.

**Sampling Methods**
Random, Multi-stage sampling technique was adopted.

In the first stage, the city was divided into three strata as:

- Elementary schools, Anganwadi (child care centres), Slum Areas.

In the second stage, schools, anganwadi and slum areas were selected randomly from the sample frame.

In the third stage, all the children between two years to below five years of age, were selected as per the above stated selection criteria.

**Data Collection Instruments**
1. Observation and interview schedules were used for demographic and anthropometric parameters.
2. Pre-structured proforma used for data collection pertaining to clinical signs and symptoms.

**Data Collection Methods**
1. Observation: This method was used to assess general behavior of children.
2. Inspection and Palpation: Clinical parameters were evaluated by inspection and palpation method.
3. Interview: This method was adopted to collect data about frequency of stool passing and other additional information on physical symptoms of children from the attendants.
3. Anthropometric parameters: The Weight and Height were measured by Digital Weight measuring scale and two meters Tape.

**Data Collection Scales**
A. Data for the weight and height expressed in numerical values and percentage scales.

B. Frequency of stools in number (n) and percentage (n)%.

**Statistical Design**
1. The weight and height of the participants were expressed in Z-score classification, as recommended by WHO child growth standard, 2007.
2. The cut point of (-2SD), was used to compare the weight and height of participants with that of median of reference population, as follows:

Wasting as defined by WHO child growth standard, [WHO; 2007] was depicted as:

A. (WHZ), weight/height of participant below -2SD (moderate low wasting)
B. (WHZ), weight/height of participant below -3SD (severe low wasting)
3. Bivariate analysis of categorical variables was performed by Fischer’s Exact Probability test.
4. p-value of ≤ 0.05 was implied as statistically significant.

**RESULTS**
1. Table-1, demonstrated the overall distribution, 240/440, 127/440 and 73/440 of study participants in different strata namely, Schools, Anganwadi and Slum areas.

<table>
<thead>
<tr>
<th>Strata</th>
<th>Participants (n/N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools</td>
<td>240/440</td>
</tr>
<tr>
<td>Anganwadi (child care centre)</td>
<td>127/440</td>
</tr>
<tr>
<td>Slum residents</td>
<td>73/440</td>
</tr>
</tbody>
</table>

2. Tables-2,3 illustrated the prevalence of overall (86%) and differential (89%), 213/240, (85%), 107/127 and (85%), 62/73 of normal children in different sections of city, Fazilka.

Further, these tables showed prevalence of wasting, overall (13%) and individual, 11%, 15% and 15% in children in Schools, Anganwadi and Slum areas under age of five years.

Further, analysis confirmed prevalence of (46%) as a whole and segmental prevalence of (37%), (30%) and (72%) in children with wasting in different strata of society under age of five years as portrayed by tables 2, 3.
Table 2: Prevalence of Wasting and Diarrhoea in children under age of five

<table>
<thead>
<tr>
<th>Strata</th>
<th>Normal children</th>
<th>Wasting in children</th>
<th>Diarrhoea in children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools</td>
<td>213/240</td>
<td>89%</td>
<td>27/240</td>
</tr>
<tr>
<td>Anganwadi</td>
<td>107/127</td>
<td>85%</td>
<td>20/127</td>
</tr>
<tr>
<td>Slum residents</td>
<td>62/73</td>
<td>85%</td>
<td>11/73</td>
</tr>
</tbody>
</table>

Table 3: Showing overall prevalence of Normalcy, Wasting and Diarrhoea in children

<table>
<thead>
<tr>
<th>Category</th>
<th>Overall prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal children</td>
<td>86%</td>
</tr>
<tr>
<td>Children with wasting</td>
<td>13%</td>
</tr>
<tr>
<td>Children with diarrhoea &amp; wasting</td>
<td>46%</td>
</tr>
</tbody>
</table>

Tables 4, 5 and 6 exemplified highly significant (p<0.001) association between wasting and diarrhea in children under the age of five years in all the three strata in city, Fazilka.

Table 4: Showing Fischer’s exact probability test between diarrhea and wasting in children in Schools

<table>
<thead>
<tr>
<th>Diarrhoea</th>
<th>Non-diarrhoea</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wasting</td>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>Normal</td>
<td>0</td>
<td>213</td>
</tr>
</tbody>
</table>

Table 5: Showing Fischer’s exact probability test between diarrhea and wasting in children in Anganwadi

<table>
<thead>
<tr>
<th>Diarrhoea</th>
<th>Non-diarrhoea</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wasting</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>Normal</td>
<td>0</td>
<td>107</td>
</tr>
</tbody>
</table>

Table 6: Showing Fischer’s exact probability test between diarrhea and wasting in children in Slum areas

<table>
<thead>
<tr>
<th>Diarrhoea</th>
<th>Non-diarrhoea</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wasting</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Normal</td>
<td>0</td>
<td>62</td>
</tr>
</tbody>
</table>

DISCUSSION

1. Diarrhoea dehydrates the body, weaken the immunity and impedes body ability to absorb nutrients from diet. These events set forth a vicious circle, wherein, the children become malnourished, which further enhances their body susceptibility to infections.

In the present study, prevalence of 46% diarrhea in children affected with wasting under age of five, as a whole has been experienced. In a study by Joshi, et al; 2011 in Bahraich district, Uttar Pradesh, India, very high prevalence rate of diarrhea (55.6%) was noticed in malnourished children. Hence, the cited study confirms prevalence of diarrhea in undernourished children, as observed in present study in Punjab. Although, prevalence rate differs due to difference in availability of food, poverty, literacy,
socio-economic status, approach to medical facilities and not the last, the time of data collection.

A report from UNICEF, India; 2006, also authenticates the present study that 39% of children with malnutrition suffered from diarrhea and received oral rehydration therapy.

2. The present study depicts very high association between diarrhea and wasting (p<0.001), and has been observed at all three strata significantly. Similar findings exposing the association between diarrhea and malnutrition, thus, authenticating present study, have been shown by [Siddique, et al; 1991], [ El Samani, et al; 1998], [Sachdev, et al; 1991].

CONCLUSION

Diarrhea is significantly, associated with acute malnutrition (wasting). It affects the state of nutrition of the body of children in their tender age. It should be addressed by multifaculty team of physicians, NGO, health workers, paramedical staff and govt. agency.

REFERENCES


