ORIGINAL ARTICLE

Acute Gastroenteritis and Acute Respiratory Tract Infections in Children coming first time to Pakistan from abroad

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ABSTRACT

Aim: To detect episodes of acute gastroenteritis and acute respiratory tract infections in children coming first time to Pakistan from abroad during first four months of stay in Pakistan.
Study design: cross sectional study.
Place and duration of study: Study was conducted for a period of four years at Doctors Hospital Gujrat and Shifa Hospital Gujrat.
Methods: Total 236 children were included in the study. Children presenting in OPD having acute gastroenteritis or acute respiratory tract infections were included in the study. Children 2 to 12 years of age were included in the study. Only those children were included in the study who came from abroad not more than 7 days back, moreover they have come first time in Pakistan after staying in any developed country. Children with known immune-compromised problem and congenital heart disease were excluded from the study. Acute gastroenteritis and acute respiratory tract infections were diagnosed on history, examination and investigations.
Results: Total 236 children were followed. Children 02 to 12 years of age were included in the study. 162(68.64%) children were from 2-7 years of age group and 74(31.35%) children were from 8-12 years of age group. Parents of all children were working in developed countries that's why all children were belonging to rich families. Out of 236 children 152(64.40%) children were males and 82(35.59%) children were females. Regarding acute respiratory tract infections; total 795 episodes (3.37 episodes per child) were observed in children. Total 610 episodes (2.58 episodes per child) were observed in children in first two months of stay in Pakistan.
Conclusions: First two months after landing in Pakistan (developing countries) are crucial regarding acute gastroenteritis and respiratory tract infections for any child from abroad especially from developed countries. During first two months of stay in Pakistan strict prevention of infections and immediate treatment of acute gastroenteritis and respiratory tract infections may decrease the chances of complications in children.
Keywords: Acute gastroenteritis, respiratory tract infection, children

INTRODUCTION

Human body may get infection any time. There are many defense systems in the body. Natural killer cells are also the strong defense system against infections. Whenever there is entrance of microorganisms in the body, there is strong response and many granzymes and perforins may help to control the infection[1].

Several cytokines help in innate immunity. Cytokines start a cascade of defense against the microorganisms to save the host[2].

Microbial opsonization, phagocyte recruitment and bacteriolysis decreases chances of infection in human body and is a strong defense system of the human body[3].

The immune system of body senses intrinsic and extrinsic factors. Human immune system is also dependent on sensory input during its development[11].

Early exposure to allergens may do problems of autoimmune diseases in human. To protect newborn babies from such diseases, we have to do more investigations on immune system development[12,13].

Received on 12-12-2019
Accepted on 28-04-2020

First three months of life are always important for development of immune system. Abnormal allergen may trigger autoimmune diseases as well[14].

Acute respiratory tract infection is a prominent cause of morbidity and mortality among children. This may be due to late start of treatment during each episode of infection[4].

In the developing countries small children have more chances of infection and death due to infection. 50% of deaths in communities of developing countries among children are less than five years of age[5].

Acute gastroenteritis is very common problem and second most common cause of morbidity and mortality in children in first three years of their life. Hospital admission rate due to acute gastroenteritis is also very high in these children. The majority of deaths are observed in low income countries (developing countries)[7,8,9].

Mother must be educated about gastroenteritis to save children from complications. In general physicians, personnel reading, different health centers and medical educational programmes are the source of knowledge for basic treatment of gastroenteritis[20].

Oral or intravenous rehydration is the main stay of treatment for acute gastroenteritis. Timely treatment may save the child from complications of acute gastroenteritis[10].

In Pakistan khichdi, ORS, banana, porridge is the commonly used diet during gastroenteritis at home. Most of the mothers start this diet before advise from doctors[21].

Most of the guidelines discourage antibiotic therapy in acute gastroenteritis. There are specific features of bacterial diarrhea like abdominal pain, fever and blood in stool. Timely management of bacterial diarrhea with antibiotics may save children from sepsis and other complications of diarrhea[22,23,24].

Antibiotic therapy in gastroenteritis may be used sometimes to decrease the duration and severity of symptoms of acute gastroenteritis[25,26].

This study may give awareness to the parents landing in Pakistan from abroad that prevention and timely treatment may decrease the complications of acute gastroenteritis and respiratory tract infections in children.

MATERIALS AND METHODS

Total 236 children were included in the study. Children presenting in OPD having acute gastroenteritis or acute respiratory tract infections were included in the study. Children 2 to 12 years of age were included in the study. Only those children were included in the study who came from abroad not more than 7 days back, moreover they have come first time in Pakistan after staying in any developed country. Children with known immune-compromised problem and congenital heart disease were excluded from the study. Acute gastroenteritis and acute respiratory tract infections were diagnosed on history, examination and investigations. Treatment was given according to the diagnosis. If needed child was admitted for treatment of acute gastroenteritis or acute respiratory tract infections. All children were followed strictly for next four months of their stay in Pakistan and each episode of acute gastroenteritis and acute respiratory tract infection was noted and treated.

Descriptive statistic like mean or proportion was calculated for age, sex, and presenting complaints.

An analysis for number of visits due to acute gastroenteritis and respiratory tract infections was made during first four months of stay in Pakistan.

RESULTS

In this study we detected extent of problem of acute gastroenteritis and acute respiratory tract infections in children during first four months of their stay in Pakistan after coming from developed countries. Total 236 children were followed. Children 02 to 12 years of age were included in the study. 162(68.64%) children were from 2-7 years of age group and 74 (31.35%) children were from 8-12 years of age group (Table 1).

Parents of all children were working in developed countries that's why all children were belonging to rich families. Out of 236 children 152(64.40%) children were males and 82(35.59%) children were females (Table 2).

Regarding acute respiratory tract infections (Table 3):

1) Total 795 episodes (3.37 episodes per child) were observed in children. Total 610 episodes (2.58 episodes per child) were observed in children in first two months of stay in Pakistan and 187 episodes (0.79 episodes per child) were observed in next 3rd and 4th month of stay in Pakistan.
2) In 2-7 years old group of children, total 583 episodes (3.59 episodes per child) were observed in children. Total 424 episodes (3.59 episodes per child) were observed in children in first two months of stay in Pakistan and 159 episodes (0.98 episodes per child) were observed in next 3rd and 4th month of stay in Pakistan.
3) In 8-12 years old group of children, total 214 episodes (2.89 episodes per child) were observed in children. Total 186 episodes (2.51 episodes per child) were observed in children in first two months of stay in Pakistan and 28 episodes (0.37 episodes per child) were observed in next 3rd and 4th month of stay in Pakistan.

Regarding acute gastroenteritis (Table 3):

1) Total 885 episodes (3.75 episodes per child) were observed in children. Total 700 episodes (2.96 episodes per child) were observed in children in first two months of stay in Pakistan and 185 episodes (0.78 episodes per child) were observed in next 3rd and 4th month of stay in Pakistan.
2) In 2-7 years old group of children, total 643 episodes (3.96 episodes per child) were observed in children. Total 502 episodes (3.09 episodes per child) were observed in children in first two months of stay in Pakistan and 141 episodes (0.87 episodes per child) were observed in next 3rd and 4th month of stay in Pakistan.
3) In 8-12 years old group of children, total 242 episodes (3.27 episodes per child) were observed in children. Total 198 episodes (2.67 episodes per child) were observed in children in first two months of stay in Pakistan and 44 episodes (0.59 episodes per child) were observed in next 3rd and 4th month of stay in Pakistan.

Table 1: Age distribution (n=236)

Age (years)	No. of children	Percentage
2-7 (n=162)	162	68.64
8-12 (n=74)	74	31.35
Total (n=236)	236	100

Table 2:Gender and socioeconomic status distribution (n=236)

Age (years)	Gender		Socioeconomic status	
	Male	Female	Low	High
2-7 (n=162)	106(65.43%)	56(34.56%)	Nil (00%)	162 (100%)
8-12 (n=74)	46(62.16%)	28(37.83%)	Nil (00%)	74 (100%)
Total(n=236)	152 (64.40%)	84 (35.59%)	00 (00%)	236 (100%)

Table 3: Episodes of respiratory tract infection and acute gastroenteritis (n=236)

Age	Acute respiratory tract infections episodes			Acute gastroenteritis episodes		
	Total episodes	1st and 2nd month of stay	3rd and 4th month of stay	Total episodes	1st and 2nd month of stay	3rd and 4th month of stay
2-7 years (n=162)	583 (3.59 episodes per child)	424(2.61 episodes per child)	159(0.98 episodes per child)	643 (3.96 episodes per child)	502 (3.09 episodes per child)	141(0.87 episodes per child)
8-12 years (n=74)	214 (2.89 episodes per child)	186(2.51 episodes per child)	28(0.37 episodes per child)	242 (3.27 episodes per child)	198 (2.67 episodes per child)	44 (0.59 episodes per child)
Total (n=236)	797 (3.37 episodes per child)	610 (2.58 episodes per child)	187 (0.79 episodes per child)	885 (3.75 episodes per child)	700 (2.96 episodes per child)	185 (0.78 episodes per child)

DISCUSSION

This study was conducted in Gujrat. Gujrat is a city of Pakistan. Members of many families in Gujrat are of out of country for earning purpose. Most of them has settled in developed countries. Many of them visit Pakistan with their children after a long stay in abroad. These children may not be having natural immunity to fight with simple micro-organisms of acute respiratory tract infection and acute gastroenteritis in Pakistan. Pakistan has high prevalence of these infections and children on first time arrival in Pakistan from abroad may get acute respiratory tract infection or acute gastroenteritis.

Human body has a strong immune system and it is fully functional in prenatal life. But it remains suppressed till some triggering factor acts on them and stimulate them. Moreover regulatory T-cells are very important mediators of this suppression[18,19].

In our study, in first two months of arrival in Pakistan there were many episodes of acute respiratory tract infection in children (Table 3). In 2001 Nilanjan studied that 20-30% of hospital admissions were because of acute respiratory tract infections. It was also observed that inadequate treatment of the episodes may give bad results[4].

In our study each episode of acute respiratory tract infection was treated timely, adequately and properly.

In 1996 Singh and Nayar observed that 50% of all deaths in the community were in small children usually less than five years of age[5].

In our study, it was seen that children coming from developed countries and staying in developing countries acquired more infections.

In 2003 Acharya discussed that acute respiratory infection are 10 to 50 times higher in developing countries than in developed countries[6].

In our study, developing countries like Pakistan shows more chances of acute gastroenteritis in children coming from developed countries.

In 2014 Oryan and others observed that acute gastroenteritis is more commonly seen in low income countries and mortality is also high in these counties[9].

In our study it was seen that younger children have more chances of infection. In this study, a large number of children were enrolled from 2 to 7 years of age (Table 1)

Kollmann in 2017 discussed that newborn babies are more susceptible to infection especially when born preterm[15]. In this study we observed that in the first two months more infections were observed and during next two months less episodes of infection were observed in children. It may be due to development of natural immunity after exposure to antigens during first few days of stay in Pakistan (Table 3).

Quanch in 2017 and Brinkworth in 2014 stated that exposure to allergen may show protection from infectious diseases but on other hand there may be increased risk of autoimmune diseases in human[16,17].

CONCLUSIONS

First two months after landing in Pakistan (developing countries) are crucial regarding acute gastroenteritis and respiratory tract infections for any child from abroad especially from developed countries. During first two months of stay in Pakistan strict prevention of infections and immediate treatment of acute gastroenteritis and respiratory tract infections may decrease the chances of complications in children.

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