
REPORTS FROM THE TROPICS

Clinical aspects of gastroenteritis in Saudi Arabian children

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SUMMARY

Hospital records of 1,618 children admitted to major hospitals in the Eastern Province of Saudi Arabia with the diagnosis of gastroenteritis were reviewed. The age range was two weeks to twelve years, though the majority of children, (89%), were under two years of age. The male to female ratio was 1.45 to 1. Associated diagnoses were upper respiratory infections, malnutrition and sickle cell anaemia in 13.3%, 2.6% and 1.6% of the cases, respectively.

Two hundred and twenty-seven of the above cases admitted to two of the five hospitals had complete records and were analyzed for presenting symptoms, degree and type of dehydration.

It is found that gastroenteritis was the second most common cause of death after bronchopneu-

monia. The overall case fatality rate in the 1,618 cases was 0.7%.

INTRODUCTION

Despite a decline in mortality rates from gastroenteritis in developed countries, the disease is still a leading cause of death in most developing countries. In addition, gastroenteritis is still a major cause of morbidity in both developing and developed countries.

The clinical manifestations of gastroenteritis have long been known worldwide; diarrhoea, vomiting and fever being the major presenting symptoms. It is also known that the ensuing dehydration, electrolyte and acid base imbalances constitute the major complications which are preventable by early and proper management. In developing countries, the problem is compounded by malnutrition, poor sanitation, lack of health education and prevalence of unhygienic habits. Moreover, difficulty of access to medical care leads to delay in treatment with increased mortality².

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The Eastern Province, like other regions of Saudi Arabia, is undergoing rapid development in all walks of life. This has contributed to an obvious improvement of health in the general population. As a result, not only the pattern of disease but also its characteristics have undergone some changes. This observation, in addition to the unavailability of published information on gastroenteritis, in children in Saudi Arabia, has prompted this survey. The object was to identify the basic clinical characteristics of the disease necessary for patient care, medical education and further research. This paper deals only with clinical aspects of gastroenteritis. Epidemiological and aetiological aspects of the disease have already been reported³.

MATERIAL & METHODS

The medical records of 1,618 children admitted to the paediatric wards of five major hospitals in the Eastern Province of Saudi Arabia were reviewed. The hospitals are located in major cities and are the major sources of care available not only to the urban population but also of to surrounding villages where approximately 26% of the population lives. Three of these hospitals belong to the Ministry of Health (Dammam Central, Hofuf General and Qatif Hospital) and represent the principal sources of care available to the general population. These three hospitals provide free services and hence a large proportion of the patients are poor. One private hospital where the attending patients are mostly of a higher socioeconomic status was included in the study. The fifth hospital, King Fahd Hospital of the University, although a referral hospital, receives a large number of children with gastroenteritis through its emergency room, which functions twenty-four hours a day as a walk-in outpatient clinic.

The period covered by this study extends from the beginning of May 1981 to the end of January 1982. Consecutive cases of gastroenteritis in children were studied. The diagnosis was made on clinical grounds, i. e. patients presenting with a combination of diarrhoea, vomiting and fever with the exclusion of other causes of these symptoms, so that all patients included in this survey had a discharge diagnosis of gastroenteritis.

Each record was studied for age, sex, associated diagnosis and outcome. Complete information on symptoms and dehydration was found in the records of two hospitals only; accounting for 227 admissions. On the other hand, to evaluate the contribution of gastroenteritis to the general mortality pattern, all deaths occurring in children admitted to Hofuf General Hospital during the survey period were studied. The choice of this hospital was based on the fact that it is the only source of inpatient care in the Hofuf area.

RESULTS & DISCUSSION

Age, sex & seasonal variation

The 1,618 cases reported in this study varied in age from two weeks to twelve years. However, 89% of the cases were in children less than two years of age. Male to female ratio was 1.45 to 1. A greater proportion of cases occurred in the winter (53%, against 36% in the summer). The significance of age, sex, & seasonal variation has already been presented³.

Associated diagnoses

Upper respiratory infection was the most common clinical diagnosis associated with gastroenteritis (13.3%), suggesting a common aetiology for involvement of both systems. Malnutrition was observed in only 2.6% of the cases. The diagnosis of malnutrition was made by gross physical examination, indicating that subclinical malnutrition might have been overlooked. This observation tends to support the concept that malnutrition is more likely a complication than a cause of gastroenteritis, and this is in agreement with findings in other reports³. On the other hand, the low percentage of malnutrition in Saudi Arabia may be the result of the improved socioeconomic status of the population. Sickle cell anaemia was associated with 1.6% of cases of gastroenteritis. This finding is most likely to be coincidental and is similar to the incidence of sickle cell anemia in the general population of the Eastern Province⁴.

Presenting symptoms

At the time of admission 84% of the cases presented with diarrhoea, while vomiting and fever

were present in 75% and 34% of cases, respectively (Table I). These findings are similar to those reported by others⁵ and emphasize the fact that in the early stages of the disease the three major symptoms are not necessarily present at the same time in all patients.

TABLE I CLINICAL FEATURES OF 227 CHILDREN HOSPITALIZED WITH ACUTE GASTROENTERITIS

<i>Clinical findings</i>	<i>Total no. of cases</i>	<i>No. showing each feature</i>
Diarrhoea	227	190 (85%)
Vomiting	227	170 (75%)
Fever	227	77 (34%)
Dehydration	227	203 (89%)

Dehydration

The state of dehydration was assessed in 227 consecutive cases of gastroenteritis admitted to two hospitals (Table II). Dehydration based on clinical examination at the time of admission was present

TABLE II CHARACTERISTICS OF DEHYDRATION IN 227 CHILDREN WITH ACUTE GASTROENTERITIS

<i>Dehydration</i>	<i>Number of cases</i>	<i>Percentage</i>
No dehydration	24	(11%)
Mild dehydration	37	(16%)
Moderate dehydration	131	(58%)
Severe dehydration	35	(15%)
Isotonic dehydration	221	(97.4%)
Hypertonic dehydration	3	(1.3%)
Hypotonic dehydration	3	(1.3%)

in 98% of the patients. Fifty-eight percent of these patients had moderate dehydration, while 16% and 15% had severe and mild dehydration, respectively. These findings are similar to data reported from other countries⁶. Dehydration was classified according to serum sodium level. Isotonic dehy-

ration (Na 130-150 mEq) was found in 97.3% of cases, while hypotonic dehydration (Na less than 130 mEq/L) and hypertonic dehydration (Na greater than 150 mEq/L) were found with equal frequency (1.3%). The predominance of isotonic dehydration is different from patterns reported from some developing and developed countries. In temperate, developed countries, isotonic dehydration accounts for 20% to 25% of cases, the hypotonic form accounting for no more than 10% of cases. In developing countries variation in the types of dehydration from country to country and within different regions in the same country has been reported. In Iran, diarrhoeal dehydration was isotonic and hypotonic in 70%, 21.3% and 8.7% of the cases, respectively⁷. In Nigeria, two studies reported different patterns: in one study hypotonic dehydration accounted for 66% of cases while isotonic and hypertonic types accounted for 33% and 1%, respectively⁸ while in another study hypertonic dehydration was found in 20-25%⁹. This variation in the type of dehydration would most likely be related to the attitude of parents toward infants with gastroenteritis and the type of feeding they gave them during the illness, and perhaps to cultural and climatic factors.

Mortality

In a large representative hospital there were 72 deaths in children between two weeks and twelve years of age (Table III). The diagnosis of the cause of death was made on clinical grounds only. Excluding motor vehicle accidents, gastroenteritis

TABLE III PATTERN OF MORTALITY IN 72 HOSPITALIZED CHILDREN

<i>Cause of death</i>	<i>No. of cases</i>	<i>Percentage</i>
Bronchopneumonia	24	33%
Gastroenteritis	14	19%
Congenital heart disease	9	13%
Measles complications	5	7%
Malnutrition	3	4%
Miscellaneous	17	24%
Total :	72	100%

ranked second only to bronchopneumonia as a cause of death. This shows very clearly that gastroenteritis is still a major cause of death in the area. The overall case fatality rate in the 1,618 case studies was 0.7%. This rate is similar to data reported in populations treated by medical assistants⁹ but is lower than rates reported from other developing countries¹⁰. Other reports from the Eastern Province of Saudi Arabia, although dealing with a more selected population, show that the case fatality rate ranges between one and four percent¹¹. The low case fatality rate in the present survey could be explained by improvement in nutritional status and better health education of the parents, who now seek care and bring their infants to health facilities in the early stages of the disease.

CONCLUSION

Gastroenteritis is still a major cause of morbidity and mortality in children of the Eastern Province of Saudi Arabia. The characteristics of the disease have been presented and discussed in the light of available literature. Although this report shows a low case fatality rate, gastroenteritis is still a major cause of death in children. Sanitation, nutrition, health education and health facilities in remote areas are still in need of further improvement. Further research on the best methods of treatment at an affordable cost, as well as on the aetiology of the disease and possible ways of preventing it are important and should be given priority in medical research.

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