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التوثيق الالكتروني والميكروفيلم

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بالرسالة صفحات

لم ترد بالأصل

HOSSAM MAGHRABY

BIOCHEMICAL STUDY OF SERUM VITAMIN (A) ZINC AND FREE FATTY ACIDS IN ACUTE INFANTILE DIARRHEA

Thesis

submitted to the Faculty of Medicine,
Tanta University,
in partial fulfillment of the requirements
of the degree of

MASTER OF MEDICAL BIOCHEMISTRY

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To My Family

بسم الله الرحمن الرحيم

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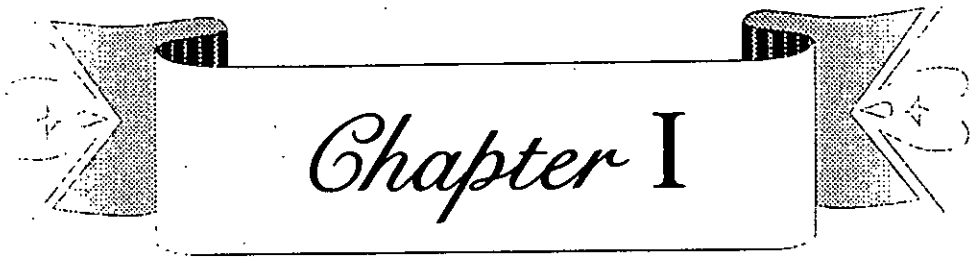

INTRODUCTION

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Diarrhea

Diarrhea is defined as an increase in frequency, fluidity and volume (>200 g/d) of bowel movement. Normal bowel function varies from individual to individual. Factors influencing stool consistency are poorly understood; water content is not the sole determinant. Thus, the definition of diarrhea in a clinical sense is an increase in frequency or increased fluidity of bowel movement in a given individual.[1]

In pathophysiologic term, diarrhea results from the passage of stools containing excess water i.e. from malabsorption or secretion of water. Although daily stool weight or water is probably the best single index to diarrhea, "small volume diarrhea" with frequent evacuation of blood, mucus, or exudate is a syndrome often signifying disease of the distal colon.[1]

Diarrheal diseases are leading causes of infant morbidity and mortality. They also cause and/or contribute to malnutrition.[2] This problem is more common during infancy than in later childhood, mainly because of the greater susceptibility of infants to infection and due to their inability to mobilize defense mechanisms as quickly as an older child.[3]

Diarrhea is more prevalent in infants who are artificially fed, in those with low socioeconomic status, and those who are malnourished.[4]

Although mortality rate due to diarrhea has been reduced in the developed countries, it is still considerable in the developing countries; in which diarrhea is the main killer of infants and children after the 28th day of life. Diarrhea represents 55% of all causes of infant death below the age of one year.[3,4]

Death in diarrheal disease is due mainly to severe electrolyte disturbance and hypovolemia.[5] The infant is more susceptible to water and electrolyte imbalance compared to the adult. This is because of the high need of growth, high ratio of body surface area to total body weight and physiological inability of renal tubules to concentrate urine.[6]

Types of diarrhea[1] :

1. With excess fecal water :

a. Osmotic diarrhea :

Due to excess water-soluble molecules in the bowel lumen. The accumulation of these osmotically active molecules draws water into the gut. This type of diarrhea is caused by laxatives, maldigestion due to enzyme deficiencies, malabsorption of sugars in mucosal disease, and transport defects of sugars.[1]

b. *Secretory diarrhea* :

Due to excessive active ion secretion (predominantly sodium) by the mucosal cells of the intestine, that is caused by bacterial toxins as in cases of cholera and toxigenic escherichia coli.[1]

c. *Exudative disease* :

Causing abnormal mucosal permeability with intestinal loss of serum proteins, blood, mucus or pus.[1]

d. *Impaired contact between intestinal chyme and absorbing surface*, as in rapid transit short bowel syndromes.[1]

e. *Motility disturbances* :

As in diabetes mellitus; this may lead to bacterial overgrowth and mal-digestion. This may cause increased hydrostatic pressure and results in luminal distention and stimulation of fluid and electrolyte secretion.[1]

2. Without excess fecal water :

Usually a result of disease of the left colon or rectum.[1]

Causes of diarrhea :

1. Infectious causes :

a. Viruses :

Approximately 50% of cases of infantile diarrhea are viral in origin and most commonly caused by Rota virus infection.[7]

b. Bacterial infections :

Most common are *Campylobacter jejuni*, *Shigella*, *Salmonella* and *Yersinia enterocolitica*.[1]

c. Bacterial toxins :

Clostridium difficile, enterotoxigenic *Escherichia coli*, *Staphylococcus*, *Vibrio parahaemolyticus* and *Vibrio cholerae*.[1]

d. Protozoa and helminths :

The most commonly encountered parasites in diarrhea includes : Giardia lamblia, Entamoeba Histolytica, Round worms and Hook worms.[8]

f. Fungi :

Thrush diarrhea can occur due to candida albicans, especially in malnourished infants.[9]

2. Non-infectious causes :

These include feeding difficulties, malabsorption, anatomical defects, endocrinal disorders, dietary factors, e.g. excessive fresh fruit intake and food allergy.[1,9]

Complications :

The loss of diarrhea fluid results in water depletion (hypovolemia), sodium (Na^+) and potassium (K^+) depletion and bicarbonate loss that may cause a hypercholermic metabolic acidosis with a normal anion gap.

Infantile diarrhea is frequently associated with an excessive loss of both water and electrolyte from the body. This loss may be in proportion to the relative concentrations found in the body fluid, leading to isoosmolar dehydration. Or the loss of water may be proportionately greater with rise of serum concentration of electrolytes causing hyperosmolar dehydration, or water loss be less than electrolyte loss resulting in lowering of serum concentration of electrolytes producing hyposmolar dehydration.[10]

The pathophysiology of various types of dehydration thus depends upon water and electrolytes remaining in the body.[11]