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STUDIES AND STRATEGIES TO REDUCE MORBIDITY AND MORTALITY FROM ENTERIC INFECTIONS

STUDIES NEEDED TO IMPROVE KNOWLEDGE OF INTESTINAL INFECTIONS AND REDUCE MORBIDITY AND MORTALITY THEREFROM

by

Dr. Herbert DuPont

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If we are to minimize morbidity and mortality of enteric infections, there are important areas where information is urgently needed. In this discussion we will consider several basic questions which require answers. For convenience, we will divide them into three groups: etiology of acute diarrhea, nutritional aspects of enteric infection and uncertainties of local problems and resources.

Etiology of Acute Diarrhea

In recent years, vast advancements have been made in elucidating the causes of diarrhea. Organisms which heretofore have been termed "normal enteric flora" have been shown to elaborate potent toxins which are active in the small intestine, while others invade the intestinal mucosa and produce severe inflammatory changes. More recently, viruses which have not yet been cultured have been shown, by direct examination under the electron microscope, to occur commonly in infantile diarrhea cases studied in Australia, Canada, Washington, D.C. and now Houston and Guatemala. Through application of newer laboratory techniques (electron-microscopy, animal models and tissue culture systems) it may be possible to determine the etiology of most cases of acute diarrhea. Once etiology has been established, a variety of secondary investigations, each important to understanding the means of controlling enteric infection, will be possible. Clinical differences in the various types of diarrheal disease can be determined which will help the practitioner select the appropriate laboratory examination of his patients. By carefully reviewing postmortem findings, newer insights into the etiology and the pathogenesis of enteric disease will also be developed. Laboratory studies of new pathogens should show the most appropriate form of antimicrobial therapy.

It is quite likely that the cause (s) of "travelers' diarrhea" which has important economic and international considerations, can be determined with the newer techniques.

Finally, and most important of all, once the etiology of most acute diarrheal diseases is established and diagnostic laboratories institute standardized identification methods for infectious microorganisms, it will be possible to determine specific epidemiologic patterns. These should include geographical distribution, description of populations at highest risk, measurement of mortality and morbidity rates and, perhaps most important, evaluation of control procedures.

Nutritional Aspects

Although it is well known that there is a close relationship between malnutrition and diarrheal disease, research is needed to determine the optimal and least expensive acceptable food supplementation which will assure

a nutritionally complete diet. It is not economically possible to provide meat for all persons, therefore it is extremely important to search for vegetable sources of protein. Field studies carried out with food supplements must assure that any preparation developed will be acceptable by the general public before widescale production is undertaken.

Local Problems and Resources

Improvement in sanitation is without doubt the most important means of controlling enteric disease. Significant advances in environmental health have been possible in many urban centers, however, rural areas need increasing attention. Prior to implementation of large and expensive programs, it will be important to evaluate each locale for available resources to deliver water supplies and provide effective sewage (excreta) removal. Supplies of well water are sufficient for certain areas, while others may require water conveyance over long distances. Availability of local water and type of soil must be assessed following consultation with appropriate authorities representing sanitary engineering and water resources. A cost-benefit analysis is essential, taking into account population size, incidence of diarrheal disease, and costs of effective water and sewage systems.

Surveys of nutritional needs should include an examination of both existing and potential local sources for protein production. Appropriate diet supplementation in areas where animal production is high will be quite different from areas where food resources are geographically distant.

Prior to instituting effective health care delivery systems, it is necessary to identify those local people who will participate in the health team. Once the number and educational level of these persons is determined, training for eventual delivery of health care and treatment can begin. Surveys of human resources should also include evaluation of local capability to establish and maintain an effective laboratory.

Finally, we should examine the problem of stimulating and then perpetuating community participation in the public health programs. Novel approaches should be tested, such as clever advertisement campaigns as well as the usual mass health education programs. Without widespread, informed public support it will be impossible to generate sufficient enthusiasm and momentum to maintain an active health program.

The major obstacles to the studies outlined in this report are logistical, not financial. To overcome these requires effort by governmental and public health authorities, research units and the public at large. Without such cooperation at all levels, any scientific discoveries or new information will be limited in usefulness.

TABLE No. 1

STUDIES TO REDUCE ENTERIC DISEASES

Primary Study	Secondary Studies
1. Determine Etiology by latest technology	a. determine clinical differences b. postmortem findings c. sensitivity to antimicrobials d. determine important cause(s) of traveler's diarrhea e. epidemiologic patterns

TABLE No. 2

STUDIES TO REDUCE ENTERIC DISEASES

Primary Study	Secondary Studies
2. Study Nutritional Aspects of Enteric Infection	a. optimal food supplementation b. minimal and least expensive food supplementation (to assure nutritionally complete diet)

TABLE No. 3

STUDIES TO REDUCE ENTERIC DISEASES

Primary Study	Secondary Studies
3. Establish Local Problems and Resources (with Cost/Benefit Analysis)	a. potential for delivery of water and disposal of excreta b. availability of local sources of protein c. study of human resources for training and delivering treatment d. survey areas to determine capability of establishing a laboratory e. examination of specific requirements necessary to establish community participation in Public Health programs. f. evaluate newer methods to elicit public support of health programs (i.e. advertisement campaigns).