REPORT ON THE ANALYSIS OF CURRENT INSTRUCTION OF DIARRHEAL DISEASE MANAGEMENT WITHIN THE DIFFERENT MEDICAL PROGRAMS OF THE NATIONAL AUTONOMOUS UNIVERSITY OF MEXICO (UNAM)

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Introduction

The Universidad Nacional Autonoma de Mexico (UNAM) is the oldest and largest university in Mexico, and one of the most prestigious institutions of higher learning in Latin America. Enrollment in the medical school has fluctuated as evidenced by admission in 1982 of nearly 5,000 first-year medical students, contrasting sharply with 900 in 1986. Thus the school has had to adapt to rapid and often drastic changes in order to keep pace with its ever-changing needs.

The Medical School has modified its study program at least ten times since 1906, due to scientific, social and political factors. Just recently the university carried out an evaluation of its medical program, and decided to adopt curricular changes. The new program is now called "Plan 1985." The previous study plan was created in 1967, and begun in 1968, with a trimestral or semestral program of courses. In 1974, an experimental program denominated Plan A-36 was created with the same objectives, but with different teaching methodologies. Plan A-36 enrolls a reduced number of students, since it is still considered an experimental program.

In summary, the 1985 Plan has currently replaced the previous medical program of 1967, and the experimental A-36 program (also known as Program of Integrated General Medicine) functions with a smaller number of students.

Evaluation of the 1967 Medical School Program: Analysis and Results

In 1982, fifteen years after the establishment of the 1967 plan, an evaluation was deemed necessary in order to determine whether the objectives of this program had been met, and whether in fact "the product" of this teaching was adequate to create the type of physicians required by the country in accordance with social changes and medical progress.

During the evaluation process, demographic factors, governmental sanitation/health policies, models of medical care, analysis of the country's current health needs, as well as a ten year forecast were considered. The evaluation also included a study of current professional practice, a quantification of the current demand for physicians at the primary health care level, and an assessment of graduate performance.

The evaluation reviewed student characteristics upon entering medical school, some teacher characteristics, course sequences, existing course syllabi, and determined whether course objectives related to career objectives. Also reviewed were programmed teaching-learning course activities, recommended reading materials and academic organization.

The results of this very important evaluation concluded that most of the Mexican population that requires health care is a predominantly young population, that is diffusely distributed in the rural areas, and has a hyperconcentration in the major cities.

The population has rates of poverty, malnutrition, low education rates, and very poor hygienic practices. They live and work in unsanitary conditions, and are afflicted mainly by infectious diseases, accidents, poisonings, and violent incidents, although an increase in mental health problems, metabolic and degenerative disorders, and higher incidence of neoplasic illness was reported.

The government is unable to subsidize coverage of health care for all facets of the population's needs, which fact limits the opportunity of institutional work for the new medical graduate, and results in a concentration of young physicians in private practice in urban areas, although there is no reliable information source about the nationwide quality and distribution of physicians.

Some relevant characteristics of the first year medical student in 1983 follow: The student population is young (average age: 19.6 years) with a slight predominance of males, the vast majority of whom had recently completed their "bachillerato" (three years of high school studies). The students come generally from secondary public schools, or from incorporated schools, to the university itself (UNAM). Only 17.4% come from private schools. About 75% of all first-year medical students had failed a course in junior high school, and one third did so in high school. Only two-thirds of the students were classified over the median in general academic achievement, and only one-third of the English). Study methods and habits are below those expected for an institution of higher education

of the population is able to translate foreign languages (mainly (1). The study revealed that the students prepare their school reports at the last minute. Their study materials are so disorganized that they need to interrupt their activities to find them when they need them, and they review their notes only occasionally.

Furthermore, they have difficulty selecting important topics to study, and often when they read a text they take irrevelant notes. They seldom use graphics, diagrams, or tables. It is difficult for them to select and study the subjects of greatest importance for an exam, and they frequently complete their exams after the assigned time for completion, or they hand them in incomplete without revision. They often feel that the explanations given by the instructor are complicated and confusing.

With regard to professional expectations, three fourths of the population plan to perform postgraduate studies, and a similar percentage intends to practice in the country's urban areas. Four-fifths of the student population desire to work in a health institution, and only three percent showed interest in teaching and research. The student population expressed unanimous interest in scientific and social service. Three-fourths of them do not work, and of those who do, only 14.6% work for more than four hours a day. Seventy-five percent of the student population are economically dependent on their families.

As for the medical-school courses themselves, many programs specify neither whether they are theoretical or practical, nor the teaching methodologies employed, nor evaluation procedures, nor the bibliography required for the course. There are some courses whose objectives and requirements seem barely related. The study revealed that the first obstacle to establishing a degree of accomplishment in the different courses was that many students did not have a program at the beginning of the course, and even some teachers admitted to not knowing the official program for the course. In other cases, a course schedule was made available by the professor.

In those cases in which an official program was available, half of the students said that the established time requirements for theoretical and practical classes had not been fulfilled. Only 60% of the teachers confirmed that the courses given were in agreement with the program. In most of the courses, the students declared that they had not taken an exam where their diagnostic skills had been tested.

In several subjects, over a third of the students pointed out that the evaluation questions often did not correspond to the subjects given in class, and that the criteria for the course evaluation had not been given at the beginning of the course. Furthermore, they were generally not informed of their mistakes, nor were they shown how to correct them.

The study concluded that the plan's efficacy was not quite satisfactory, and that neither the last-year medical students nor the graduates had learned all the fundamental tasks of the career.

Nonetheless, they need to practice on a daily basis immediately upon graduation. The major deficiencies were in relation to community medicine tasks, although a good number of tasks were learned during the year of required social service.

CURRICULUM CHANGES

This review resulted in the following curriculum changes:

First, the Medical School's activities have now been grouped into four major categories. Group A corresponds to those activities directly related to care and preventive measures for the healthy individual, the family, and the community, and consist of necessary actions for the promotion of health. Some of these areas include: prenatal care, uncomplicated deliveries, family planning, growth monitoring in infants, pre-school and school children in well-baby clinics.

Group B is comprised of activities that may be necessary for the promotion of health, targeted protection, early diagnosis, and early treatment and rehabilitation of the individual. For this article's purposes, the areas that are relevant to diarrheal illness and are included in this group are:

- intestinal amebiasis
- dysentery
- typhoid fever
- other salmonella infections
- gastroenteritis
- parasitosis
- first- and second-degree malnutrition
- dehydration and electrolyte disorders.

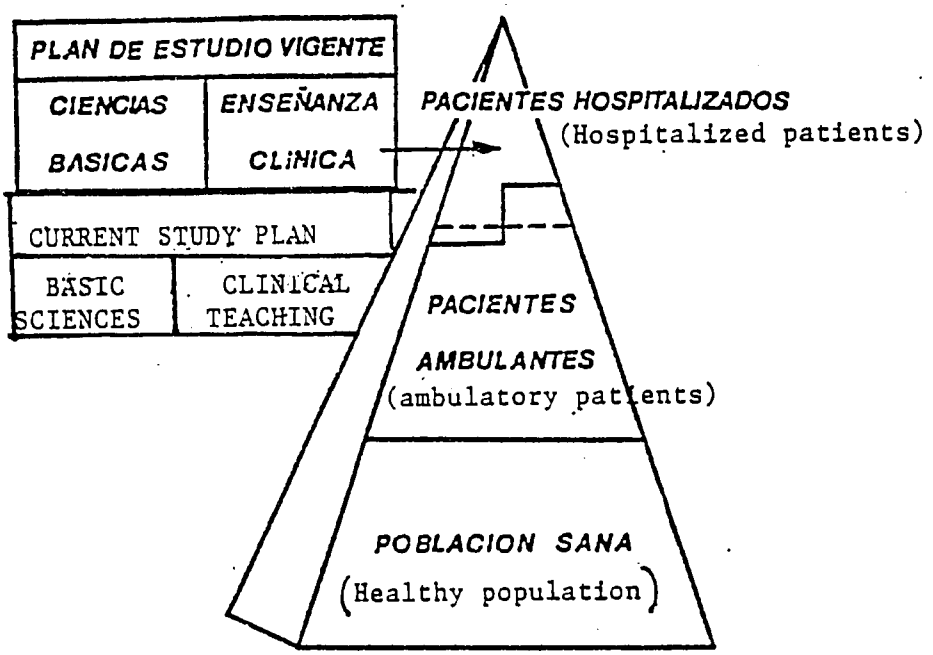
Group C represents those actions necessary for the promotion of health, specific protection, early diagnosis, and early treatment but requiring specialized care, for a number of illnesses. Of importance to this article are electrolyte and acid-base complications

Group D lists a number of diseases that the physician is expected to refer to specialized care. Included in this list are rabies, mycotic diseases such as histoplasmosis and coccidiomicosis, cancer, lymphomas and Acquired Immunodeficiency Syndrome (AIDS).

It seems from these reforms that the physician will in fact be expected to be competent in treating common diarrheal disorders, and to request specialized care in "electrolyte and acid-base disorders", which presumably refers to complications resulting from severe dehydration. The scope of knowledge that will be expected from a physician in this field will range from preventive measures to the clinical skills required to treat basic uncomplicated cases of diarrheal disease.

It is important to point out that no mention is made of the specific knowledge of oral rehydration therapy, although ORT is presumably included in the skills the student must learn. However, evidence from course materials strongly suggests that ORT indeed plays a very minor role in the overall strategy of diarrheal disease management. Also important to point out is the fact that no emphasis is made in course material to teach the student the importance of adequate nutrition during and after diarrheal illness. In material where this is mentioned it is incomplete, or not updated.

EXPERIMENTAL PROGRAM, "PLAN A-36"



Taken from UNAM: Programa de Medicina General Integral

This diagram shows the medical school's program prior to the 1985 study plan, and its relation to the country's health needs. The program divided medical instruction into one period of basic sciences and another of clinical practice, forcing students to learn theoretical information during the first two years, and to apply that information in the later clinical years. This lack of immediate connection between theory and its application to reality contributed to students forgetting the information received, and required clinical teachers to repeat what the student frequently did not remember. Areas of conflict

were often created, leading to dispersion of knowledge in the majority of students, who found it difficult to integrate everything together.

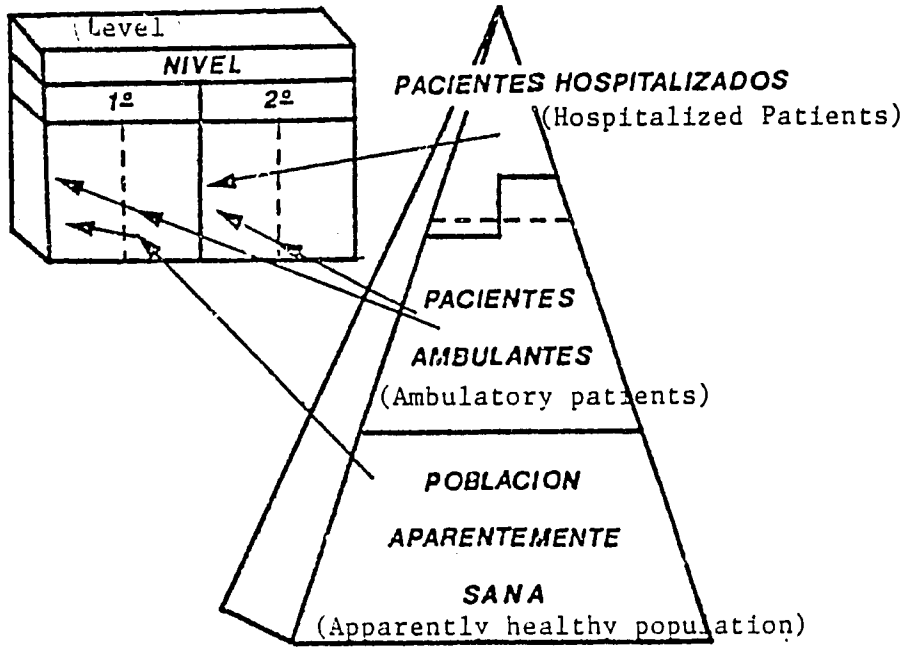
The teaching methods were not appropriate. Basic sciences and clinical courses were primarily taught in classrooms. Therefore, the student's activities consisted only of listening to information which certainly could have been transmitted more efficiently by other, more active methods. Practical learning of basic sciences was limited to the daily repetition of experiments that frequently did not seem to have connection with professional reality.

It was difficult for the student to have contact with the community and the environment. This situation helped to focus the student's attention on illness, instead of health, and prevented him from fully developing the skills of a general practitioner.

After a review and consideration of all these factors, the medical school developed a new program which began in 1974.

The purpose of this plan, thus named for the initial number of students per group (also known as the Program of General Integrated Medicine), was designed to prepare general practitioners to solve problems of prevention, diagnosis, treatment, and rehabilitation of the most frequent illnesses, using primary-level resources that do not require specialized equipment or personnel.

Methodology: Plan A-36



Taken from UNAM: Programa de Medicina General Integral

Theoretical information was applied to practice with the purpose of developing permanent study habits and clinical judgement that progressively lead the student to the possibility of solving problems of greater complexity as he or she advanced to higher levels. This opportunity is made possible by the training the student receives in the health-care centers to which he or she is assigned, such as family medicine units, local health centers, or general hospitals.

STUDY-PLAN STRUCTURE

The duration of each school year is 40 weeks. The final year is a year of social service which lasts 49 weeks.

This new program does not require a year of undergraduate internship, with the understanding that the training in this system integrates the internship year into the previous study years.

The first year consists of six modules and deals with the process of human growth and development. These modules maintain an integration with activities that are carried out in the health centers. The student learns about prevention and early treatment of illness, and about preventive measures in the community.

The second year is designed to study the relation between different systems and the organism as a whole, as well as the organism's relationship with the environment. This year has twelve modules that are related to the health center's activities, school health programs and community research.

Total "module hours" in the first level (first and second year) are distributed as follows:

- activities of theoretical discussion and tutoring in classroom: 1672 hours
- clinical activities in the health center and obstetrics service: 412 hours
- community activities: 352 hours

The third year is structured around the natural history of illness, developed through the review of basic, clinical, epidemiological, and social aspects of the most frequent illnesses at the primary health setting. Work is performed in

the outpatient clinics of Family Medicine and in Units, emergency wards, and hospitals. This work is supported by necessary medical resources and teaching facilities, such as classrooms, etc., where the student follows the review of basic theoretical aspects.

The fourth year is structured in the practice of general medicine in hospitals and the ability to refer the ill to a specialized center. The student is integrated into emergency- and specialized-service activities, where he acquires the knowledge and skills that he or she must have as a general practitioner.

The total number of "module hours" in the second level is divided in the following manner:

- activities of theoretical discussion and tutoring in the classroom: 950 hours
- clinical activities: 1700 hours
- clinical supplementary activities: 425 hours

MODULES THAT ARE RELATED TO DIARRHEAL ILLNESS

The nature of the A-36 plan allows students to have contact with patients with diarrhea practically from the start of their medical studies, since the program is designed to let them become acquainted with common community-health problems in the early years.

It is from this early stage that they first become acquainted with oral rehydration therapy. Further on in their

studies, they participate in all aspects of diarrheal disease management, as their clinical responsibilities with patients increase.

It is in their fourth year of training, however, when they take their formal pediatric courses, that they make a final, in-depth review of all clinical and physiological aspects of infant diarrheal disease management.

A review of the clinical material they are supplied with, as well as recommended bibliography for subjects like "gastroenteritis", and "dehydration and electrolyte disorders", lead us to make the following observations:

- The "module handbooks" for students concentrate almost entirely on pathophysiology, IV therapy, and electrolyte disorders.

- Although ORT treatment is mentioned as a safe and inexpensive method for treatment of dehydration, the overwhelming concentration on IV therapy makes it easy for the student to overlook major indications, benefits, or potential limitations of ORT.

- Several on-site visits to different health centers affiliated with the A-36 Plan in the outskirts of Mexico City showed that students, residents, and pediatricians were aware of ORT benefits, and were in fact prescribing ORT for treatment and prevention of dehydration, as well as indicating proper nutrition during and after

diarrheal episodes, and contraindicating the use of unnecessary antibiotics and antidiarrheal drugs, except when etiologically indicated. The questions that remain unanswered are how effectively mothers are preparing and administrating ORT, and whether the observations collected from these centers represent how the majority of students, residents, and specialists manage infant diarrheal disease.

CONCLUSIONS AND RECOMMENDATIONS

The traditional program initially devotes more time to theoretical instruction. The first two years of the six year program devote instruction and emphasis on the public health and preventive measures. Subsequently, theoretical-supervised clinical case management is emphasized. Students receive classes and attend clinics and affiliated hospitals where their clinical responsibilities gradually increase as they approach their full year of internship. On occasions however, the student can find instruction confusing. Topics like gastroenteritis, dehydration and electrolyte imbalance are covered in different classes including gastroenterology, infectious diseases and pediatrics. Although emphasis on different areas should be expected, the student is confused by the lack of consensus. Reform of the traditional program intends to correct such indiscrepancies.

The results of these observations show that, with regard to diarrheal disease management, the principles and

theories of the experimental A-36 study plan are effective in teaching medical students about the great importance that diarrheal disease plays within the Mexican population. From the early years of training, the student becomes fully aware of its everyday prevalence, and comes to realize how important it is to manage and treat diarrhea effectively.

However, there are flaws that afflict both the Plan 85 and A-36 Plan programs and that require urgent correction. It is here that the following recommendations can be made:

1. There is urgent need to either update, modify, or replace current textbooks and recommended bibliographies used for the instruction of diarrheal-disease management. The material currently used, including the "module handbooks" of the A-36 Plan, is clearly not up-to-date, and is presented in an overwhelmingly long and complicated fashion. Even before the student has the opportunity to attend lectures or read this material, he or she will have undoubtedly have heard from classmates that the classes of "electrolyte and liquid disorders" are among the most complicated.

2. As stated in the UNAM's evaluation of its 1967 study plan, it is important for the students to be provided with a well-defined course program, one that specifies theoretical and practical activities clearly, teaching methods to be employed, and evaluation procedures.

The student should be clearly informed of what is expected of him or her at the beginning of the course, and the evaluation questions should correspond to the previously stated criteria for course evaluation.

3. Diarrheal-disease management should be taught in an "integrated fashion", teaching all aspects of proper clinical management of complicated and uncomplicated diarrhea cases, appropriate feeding practices during and after diarrheal illness, as well as other nutritional aspects of diarrhea, such as growth monitoring and catch-up growth.

4. Oral rehydration therapy should be emphasized as the treatment of choice for dehydration except in cases of severe dehydration with shock. Mexico has made great progress in recent years to promote this program nationwide. The implications of this promotion will result not only in saving many infant lives, but also in a remarkable reduction in hospital beds used for diarrhea patients, and millions of pesos saved, as recently reported by the Chairman of Mexico's ORT program (2).

It is probably reasonable to assume that the problems in medical education discussed here are affecting all other medical schools in Mexico. In fact, our conclusions coincide with those of a group of medical educators with broad experience in diarrheal disease, convened by the CDD Program of the World Health Organization in August of 1985 (7)

That group concluded that the experience of students on the teaching hospital ward and ambulatory care unit where diarrhea is being managed is the critical determinant of their subsequent behavior. Where this experience reinforces the use of ORT, the students will leave convinced and will adopt that method for their own patients.

Based on this conclusion the group recommended that WHO assist medical schools throughout the developing world to establish diarrhea treatment units in their teaching hospitals which would both carry out appropriate and effective diarrhea case managment and would assist medical students in the most effective manner possible to learn appropriate and effective diarrhea case management. These efforts are currently being undertaken by WHO/PRITECH as a collaborative project, with preliminary production of materials for clinical instruction scheduled for 1987.

The group emphasized that to be successful, the unit should not only illustrate ideal case management, but should also use the most effective educational methodologies. Customary teacher-oriented didactic approaches, such as lectures, should be minimized, while student-oriented, active, participatory, experimental, and self-learning approaches should be emphasized. Faculty trained and enthusiastic about these methods will make the rotation on the unit both productive and enjoyable for the students, and may influence other faculty members to try similar approaches and materials in their teaching.

Successful establishment and appropriate instruction of diarrheal disease management in the diarrhea training units, and replacement of current educational materials, will no doubt result in comprehensive, adequate and effective management of diarrheal illness.

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