
International Perspectives

Medicine in the Mexican Sierra Madre

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We have recently served as consultants to the young social service interns who provide health care to the Tarahumara Indians in the Mexican Sierra Madre. This memorable experience provided considerable insight into the somewhat complex health care system in Mexico and into the health care of one of the world's more fascinating indigenous peoples.

The setting into which we arrived was reached via a serpentine seven-hour train ride into the Sierra Madre from the city of Chihuahua. At 8,000 feet, the town of Creel, our destination, is surrounded by alpine forests, lakes, and towering rock outcroppings. It is a town of 5,000 people,

approximately 15 telephones, one unpaved and very dusty main street, a few cowboys, many Indians (some living in caves overlooking the main street), and the Jesuit Mission Clinic, which is staffed by social service interns serving their obligatory year of public service to the indigent. This is the municipal and medical center for 50,000 Tarahumara Indians, who are scattered widely through the vast pine-covered Sierra Madre and its breathtaking canyons. Existing in a subsistence economy, many living far from any road, Indians who wish to visit Creel must often travel on foot for hours or even days to reach the nearest railway crossing to catch the trains that run once a day in each direction. The Tarahumara are largely non-Spanish-speaking and illiterate, and when modern medical care is sought, it is only as a last resort because of inaccessibility, cost, and unfamiliarity. Since most health problems are treated either with herbs (about 300 in active use) or by traditional healers known as shamans, visits to the clinic in Creel represent true desperation by a remarkably stoic and hardy people. When they do come to the clinic, they are sick.

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The Tarahumara are perhaps best known as runners who have the stamina to run down a deer, but their biological hardiness was also striking to us. We saw several instances of recovery from serious injuries and infections that tended to reinforce an awareness of the venerable process of natural selection through which all Tarahumara have passed. One case especially deserves mention—that of a 26-year-old Indian man who was stabbed in the abdomen in a dispute inspired by locally made corn beer. The man arrived at the clinic with his intestines almost totally outside his abdomen and packed in goat manure. The social service physicians, without benefit of general anesthesia, irrigated the bowel, placed it back inside the abdomen, closed the patient up under local anesthesia, and began vigorous antibiotic therapy. The patient was back tilling his cornfield with his horse-drawn wooden plow two months later.

Such examples of immunologic prowess follow from the extraordinary challenges to survival that the Tarahumara face throughout their lives. Births are attended in the typical dirt-floored home by grandmothers or neighbors. During the first five years of life, gastroenteritis and other infections conspire with malnutrition to carry off as many as 50 percent of Indian children. For those who survive the ubiquitous sanitation and waterborne illness problems, marginal nutrition from two years of breast-feeding and a corn gruel diet renders infants susceptible to devastating cases of measles, otitis media, and pneumonia. Beyond these rigors, then, lurk summer rattlesnakes and deep winter snows, and everywhere, the white plague of tuberculosis.

Small wonder that such a life, both hard and precarious, should lead to frequent consultations with shamans and other traditional health care providers. There is, perhaps, more preventive medicine in their practices than there is in our own system, with preventive curing ceremonies being performed, not only for people, but also for animals and crops. The “cures” allegedly prevent such illnesses as those caused by underground spirits, angry peyote plants that have the power to curse, and various natural hazards such as the great white frog and the bird that can suck out the sleeping soul in the dark of night.

The decision to seek medical attention from a physician is a last resort, sometimes prompted by the traditional health providers themselves when

their efforts fail. Once at the clinic, the patients are cared for by recent graduates of one of Mexico's medical schools. These hardworking young physicians fill an important need in this still developing country. As required by law, they serve for a year at relatively low salary, taking care of very complex medical problems with limited resources. They must manage life-threatening, and all too often fatal, diarrheas with no equipment for laboratory electrolyte determinations. Nor is there bacteriology capability in this community, which has frequent epidemics of typhoid. Fortunately, the clinic does have an x-ray machine, but because of shortages of electricity, it is run for only about an hour a day. The pharmacy is well run and surprisingly well stocked as a result of the pharmacist's diligence, but certain expensive preparations, such as rifampin, are unavailable.

The clinic has an immaculate 30-bed hospital ward attached. A local woman has obtained laboratory technology training and performs simple tests, such as blood counts and urinalyses; liver chemistries and blood banking; however, are absent. Forced to improvise ways of dealing with complex problems, the physicians, or *pasantes* as they are called, refer frequently to the popular American medical texts that are in the clinic library, struggling to understand the English. They rely considerably on physical diagnosis and clinical techniques, shifting diagnoses when chastened by the clinical response. A typical case was that of a young woman with a temperature of 41°C, severe headache, leukopenia, and splenomegaly, who was at first suspected of having malaria but whose response to the eventual test of intravenous chloramphenicol tended to confirm the diagnosis of typhoid fever.

Occasional cases have to be referred out to the social service hospital in Chihuahua for diagnostic or therapeutic specialty treatments unavailable in Creel. Although the government provides health care for the medically indigent of Mexico—an estimated 60 percent of the nation's people—there are some charges associated with this service, which is supported by theoretically universal taxation. (In one case, a *pasante* received a bill from the social service hospital after he sent in a totally indigent Indian patient.) One gets the sense that the 30 percent or so of Mexican people who are eligible for the employee health care system partially subsidized by their employers, or the 10 per-

cent or so who enjoy sufficient affluence for private medical care, are generally better off. Indeed, the social service clinics that we visited were frequently lacking in resources, supplies, or even physicians and were indicative of a level of service for the poor that appeared well intended but threadbare.

Thus, the synergistic combination of resources offered by the Jesuit clinic and its government-sponsored physicians in the little town of Creel is a fortuitous one, no doubt improving greatly on what either the church or the government alone would be able to provide. Our study of the clinic's records showed that more than 6,000 visits were made to the facility from August 1, 1981, to July 31, 1982.

In spite of the clinic's merit, however, the Indians tend to come in less frequently, proportionately, than their Mexican mestizo counterparts, and once they do come, they tend to be hospitalized more often than mestizos. In a review of 6,000 clinic visits, we found that a total of 24 percent of the Indians were admitted to the hospital in contrast to 8 percent of the Mexican mestizos. The Indians were much more likely to be hospitalized with contagious diseases, such as tuberculosis or severe diarrhea, and preliminary analysis of the mortality statistics of the clinic indicates that they had a much higher mortality rate, as might be expected from the fact that they were sicker when they came in. Interestingly enough, there were only 24 obstetric admissions of Indians in the past year. Most were very complicated, some patients presenting with herbs in the vagina or stones tied to the prolapsed umbilical cord. Clearly, pregnancy and normal childbirth are not considered a disease in the Tarahumara culture.

We observed that the support staff, the nurses, and the physicians maintained a high morale, despite low wages. (The physicians earn \$160 per month, working every other or every third night and weekend, for a whole year. But then, a worker in the local sawmill earns \$1.50 per day.) Of special interest in the United States is that the physicians find their experience gratifying enough that many come back for visits in future years, and two physicians of our acquaintance remained on

for additional years of voluntary service in spite of the low pay. Two other physicians went into practice in small towns in the Sierra, where their incomes were marginal but where they could continue taking care of a needy population. Thus, the rewards of the humane services that can be rendered in this setting are important in attracting physicians to settle in the area, even though the economic incentives are presumably not great.

One comes away from an experience such as this with a host of new insights. Among our many new perspectives is the sense that even with less affluence to invest in technology, Mexico may have something to teach us in the United States through its approach to providing health care to the indigent. Mexico's required year of social service for physicians (six months for nurses) seems an idea that has received too little attention in our own country, which still has vast numbers of medically underserved and indigent people. Our admiration for the dedicated and humane Jesuits and their mission organization is great, and the modesty and continued diligence of the nuns who manage the clinic is inspiring. Finally, the uncompromising fortitude and courage of the Tarahumara people in the face of their bewitching but harsh mountain ambience once again inspires admiration for the power of man to endure and even prevail.

Ours is a world of inequalities, and other physicians venturing into the Third World to extend a helping hand will be enriched by the response, as we were.

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Keflex®
cephalexin

Brief Summary. Consult the package literature for prescribing information.

Indications and Usage: Keflex is indicated for the treatment of the following infections when caused by susceptible strains of the designated microorganisms:

Respiratory tract infections caused by *Streptococcus (Diplococcus) pneumoniae* and group A beta-hemolytic streptococci (Penicillin is the usual drug of choice in the treatment and prevention of streptococcal infections, including the prophylaxis of rheumatic fever. Keflex is generally effective in the eradication of streptococci from the nasopharynx, however, substantial data establishing the efficacy of Keflex in the subsequent prevention of rheumatic fever are not available at present.)

Otitis media due to *S. pneumoniae*, *Haemophilus influenzae*, staphylococci, streptococci, and *Neisseria catarrhalis*

Skin and skin-structure infections caused by staphylococci and/or streptococci

Bone infections caused by staphylococci and/or *Proteus mirabilis*

Genitourinary tract infections, including acute proctitis, caused by *Escherichia coli*, *P. mirabilis*, and *Klebsiella* sp.

Note—Culture and susceptibility tests should be initiated prior to and during therapy. Renal function studies should be performed when indicated.

Contraindication: Keflex is contraindicated in patients with known allergy to the cephalosporin group of antibiotics.

Warnings: BEFORE CEPHALEXIN THERAPY IS INSTITUTED, CAREFUL INQUIRY SHOULD BE MADE CONCERNING PREVIOUS HYPERSENSITIVITY REACTIONS TO CEPHALOSPORINS AND PENICILLIN. CEPHALOSPORIN C DERIVATIVES SHOULD BE GIVEN CAUTIOUSLY TO PENICILLIN-SENSITIVE PATIENTS.

SERIOUS ACUTE HYPERSENSITIVITY REACTIONS MAY REQUIRE EPINEPHRINE AND OTHER EMERGENCY MEASURES.

There is some clinical and laboratory evidence of partial cross-allergenicity of the penicillins and the cephalosporins. Patients have been reported to have had severe reactions (including anaphylaxis) to both drugs.

Any patient who has demonstrated some form of allergy, particularly to drugs, should receive antibiotics cautiously. No exception should be made with regard to Keflex.

Pseudomembranous colitis has been reported with virtually all broad-spectrum antibiotics (including macrolides, semisynthetic penicillins, and cephalosporins); therefore, it is important to consider its diagnosis in patients who develop diarrhea in association with the use of antibiotics. Such colitis may range in severity from mild to life-threatening.

Treatment with broad-spectrum antibiotics alters the normal flora of the colon and may permit overgrowth of clostridia. Studies indicate that a toxin produced by *Clostridium difficile* is one primary cause of antibiotic-associated colitis.

Mild cases of pseudomembranous colitis usually respond to drug discontinuance alone. In moderate to severe cases, management should include sigmoidoscopy, appropriate bacteriologic studies, and fluid, electrolyte, and protein supplementation. When the colitis does not improve after the drug has been discontinued, or when it is severe, oral vancomycin is the drug of choice for antibiotic-associated pseudomembranous colitis produced by *C. difficile*. Other causes of colitis should be ruled out.

Usage in Pregnancy—Safety of this product for use during pregnancy has not been established.

Precautions: General Precautions—Patients should be followed carefully so that any side effects or unusual manifestations of drug idiosyncrasy may be detected. If an allergic reaction to Keflex occurs, the drug should be discontinued and the patient treated with the usual agents (e.g., epinephrine or other pressor amines, antihistamines, or corticosteroids).

Prolonged use of Keflex may result in the overgrowth of nonsusceptible organisms. Careful observation of the patient is essential. If superinfection occurs during therapy, appropriate measures should be taken.

Positive direct Coombs' tests have been reported during treatment with the cephalosporin antibiotics. In hematologic studies or in transfusion cross-matching procedures when antiglobulin tests are performed on the minor side or in Coombs' testing of newborns whose mothers have received cephalosporin antibiotics before parturition, it should be recognized that a positive Coombs' test may be due to the drug.

Keflex should be administered with caution in the presence of markedly impaired renal function. Under such conditions, careful clinical observation and laboratory studies should be made because safe dosage may be lower than that usually recommended.

Indicated surgical procedures should be performed in conjunction with antibiotic therapy.

As a result of administration of Keflex, a false-positive reaction for glucose in the urine may occur. This has been observed with Benedict's and Fehling's solutions and also with Clintest® tablets but not with Tes-Tape® (Glucose Enzymatic Test Strip, USP, Lilly).

Broad-spectrum antibiotics should be prescribed with caution in individuals with a history of gastrointestinal disease, particularly colitis.

Usage in Pregnancy—Pregnancy Category B—The daily oral administration of cephalexin to rats in doses of 250 or 500 mg/kg prior to and during pregnancy, or to rats and mice during the period of organogenesis only, had no adverse effect on fertility, fetal viability, fetal weight, or litter size. Note that the safety of cephalexin during pregnancy in humans has not been established.

Cephalexin showed no enhanced toxicity in weaning and newborn rats as compared with adult animals. Nevertheless, because the studies in humans cannot rule out the possibility of harm, Keflex should be used during pregnancy only if clearly needed.

Nursing Mothers—The excretion of cephalexin in the milk increased up to four hours after a 500-mg dose; the drug reached a maximum level of 4 mcg/ml, then decreased gradually and had disappeared eight hours after administration. Caution should be exercised when Keflex is administered to a nursing woman.

Adverse Reactions: Gastrointestinal—Symptoms of pseudomembranous colitis may appear either during or after antibiotic treatment. Nausea and vomiting have been reported rarely. The most frequent side effect has been diarrhea. It was very rarely severe enough to warrant cessation of therapy. Dyspepsia and abdominal pain have also occurred.

Hypersensitivity—Allergies (in the form of rash, urticaria, and angioedema) have been observed. These reactions usually subsided upon discontinuation of the drug. Anaphylaxis has also been reported.

Other reactions have included genital and anal pruritus, genital moniliasis, vaginitis and vaginal discharge, dizziness, fatigue, and headache. Eosinophilia, neutropenia, and slight elevations in SGOT and SGPT have been reported.

Additional information available to the profession on request from



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to health and social support and coping." Two contributors, Ian McWhinney and Jack Medalie, hold impressive family medicine credentials, but neither their writings nor those of the other symposium members seem to address the purpose of the symposium in a cohesive manner.

It was a joy to read McWhinney's scholarly treatment of how physicians accrue knowledge ("objective information and subjective understanding") that pertains to a family's social and behavioral history. McWhinney's honesty is refreshing: "Our (family physician's) information about patients and their families is at best fragmentary. In perhaps 10 percent of families it approaches what we might call completeness." In addition McWhinney notes, "treating the family as the patient—like many ideas transferred from other disciplines—has limited application to family practice."

Of the book's authors, Medalie comes closest to revealing the issues that must be addressed to clarify family health. Not only does he list presenting problems that may be considered cues for family study, but he also outlines strategies for assessment and intervention. Medalie's schema is not, however, utilitarian, but should serve as a springboard for future studies.

The chapter "Adaptation and Health: A Life-Span Perspective" by David and Beatrix Hamburg offers a general model for coping that is worth examining. There is, however, little explanation of how the practitioner can use general coping theory in dealing with problems of family dysfunction seen in the clinic or office. The reader will

nevertheless gain an improved understanding of coping strategies by reviewing the ways in which the Hamburgs examine how adolescents and middle-year adults deal with crises.

The final chapter on assertiveness training for adolescents seems to be a "filler." It lacks a sense of belonging to the book's theme. Granted, adolescents do have families, but the role of families in assertiveness training is never made clear.

This book may be of interest to a limited number of researchers in family studies. The lack of cohesiveness in the chapters leads this reader to the impression that not all symposia should be edited into books.

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Pediatric Drug Handbook. William E. Benitz, David S. Tatro. Year Book Medical Publishers, Chicago, 1981, 475 pp, price not available.

This is an excellent book for quick reference on pediatric drug dosages, indications, availability, administration, and toxic side effects. It is well-indexed and divided into chapters based on organ system as well as according to therapeutic indication. The index contains generic as well as brand name drugs for easy cross-referencing. There is also a very good review at the beginning of the book on antidotes for particular problems. The book would have been enhanced by adding treatments for drug overdoses with each drug that is discussed. Despite that oversight, it is an extremely handy book for office practice as well as for residency programs or students.

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