Pan American Health Organization

PAHO/ACMR 13/12
Original: English

THIRTEENTH MEETING OF THE
ADVISORY COMMITTEE ON MEDICAL RESEARCH

Washington, D.C.

24-28 June 1974

CONTROL OF DISEASE IN AMERINDIANS IN CULTURAL TRANSITION

CONTROL OF DISEASE IN AMERINDIANS IN CULTURAL TRANSITION*

The impression of exuberant health projected by most primitive populations at time of first contact has been well documented. Equally well documented is the rapid collapse of health under the usual conditions of acculturation. During the past 12 years my colleagues and I have been involved in the study of Amerindian groups in rapid transition. The primary focus of our interest has been to further our understanding of the important genetic parameters of tribal man. Inevitably, however, we have been drawn into an attempt to understand the biomedical pressures shaping some of those parameters, and how those pressures change during the process of acculturation.

All of us here are committed to the truism that the state we call health is a fragile thing of many components. As our studies have progressed, we have made the usual discovery of the complexity of the interplay of these components. A consideration of this interplay rapidly draws one into a systems-type analysis, with an accompanying effort to identify how the role of specific components in the system may alter as the nature of the external forces impinging on the system alters.

Any single individual's view of primitive man is strongly colored by those representatives he has contacted. For ourselves, much of our thinking has been shaped by contacts with the Xavante, Cayapó, Yanomama, and Makiritare (Maingong) of the Orinocco and Amazon drainage basins as representatives of tribes in rapid transition, and the Macushi, Wapishana, Krao, and Piarôa as tribes well along in the process. My comments are largely based on first-hand contacts with these groups--generalize at your own risk.

---

*Prepared by Dr. James V. Neel, Department of Human Genetics, The University of Michigan Medical School, Ann Arbor, Michigan.

These groups lived until recently in villages of 50-250 persons. Their livelihood depended on hunting, gathering, and slash-and-burn (swidden) agriculture, wherein the principal crops were mandioca, the cooking banana, or maize. The location of their gardens shifted constantly, the location of their villages shifted less frequently. Game, while not abundant in comparison with the situation in temperate grasslands, met the protein needs of a people whose principal cultivated crops were quite starchy. The important disease pressures were of the endemic rather than the epidemic type. Most of the common intestinal parasites are to be found in their feces, and to judge by their antibodies, they are exposed to enteric and arboviruses in abundance.

It is a common misconception that because of disease pressures, primitive man was reproducing at near capacity in order to maintain his numbers. In the least acculturated group with which we have worked, the Yanomama, this is surely a misconception. We find the average woman introduces a new child into the culture about every 3 1/2 to 4 years. This child spacing is accomplished by intercourse taboos for a variable period following birth of child, abortion by crude but effective methods, and, finally, if other measures have failed and a child comes too soon, infanticide, especially directed towards female infants. Some tribes have official village wantons or prostitutes, to satisfy the sexual drives of men denied access to their wives because of a recently born child.

Infant and childhood mortality from natural causes is some 20 percent, high by the standards of contemporary western nations, but low by the standards of tropically situated nations of 60-70 years ago. We attribute this to several factors. Gamma globulin levels of these Indians are roughly twice our own, reflecting continuing pressure from endemic diseases. We presume that the newborn child has high passive immunity to the local diseases. He immediately comes into an intimate contact with his environment that would stupefy a

Western-culture mother, and we have suggested a relatively smooth transition from passive to active immunity for many of the endemic diseases. The necessary studies on antibody acquisition to sustain that thesis have not been carried out because of certain practical difficulties in obtaining blood from the very young under our field conditions. Because of the above-mentioned child-spacing, a child will nurse for approximately three years. This not only ensures a generally adequate supply of what still seems to be the best baby food, but also may be important in ameliorating the medical cost of acquiring immunity to a variety of diseases.

Leave us consider now the usual impacts of contact with Western culture on this system. My argument will be that the important factors in these first contacts have changed dramatically in the past century, and with this, so has the strategy of ensuring the smoothest cultural transition possible.

A century or two ago, the most immediately devastating of the impacts of the Western World on cultures of this type were those due to epidemic and venereal diseases: small pox, measles, pertussis, tuberculosis, syphilis, and gonorrhea (we found no evidence for syphilis in recently-contacted Indians). Those who survived these diseases were often introduced to alcohol in large quantities by unscrupulous traders. In addition to the problem of alcoholism created by this practice, the amount of traumatic death engendered thereby must have been very considerable. Finally, although impossible to evaluate in any quantitative way, the fact that many Indian groups were defeated and harassed by representatives of an alien culture and often forcibly displaced from traditional lands must have created a mental set incompatible with the positive outlook of such value in the face of serious disease.

These problems are no longer--or should no longer be--the chief problems

of early contact. There are effective immunization programs for many of the diseases I have mentioned, actively pursued by missionary and government groups, and where these are lacking, as for syphilis and gonorrhea, effective therapeutic modes. Moreover, in groups of high susceptibility reached by measles or pertussis prior to immunization, there are effective antibiotics for the primary complication of the disease, pneumonia. Incidentally, our own experience with measles in a "virgin soil" population, the Yanomama, has convinced us that the primary response of the Indian to measles is not very different from our own. The relatively high mortality results from the secondary features of an epidemic which incapacitates essentially all members of a village simultaneously, including both the mother and her nursing child, in a culture where food and water must be gathered daily. Stated more pointedly, one cannot attribute poor therapeutic results in a measles epidemic to some mysterious, innate, constitutional susceptibility: the mortality from measles among Indian children should not differ greatly from that among Caucasian children given the same level of care.

Furthermore, all the governmental programs with which I have any familiarity are making strenuous efforts to limit the introduction of the Indian to alcohol. Although this clearly is a temporary matter--one cannot speak of full citizenship and then impose special restrictions--it is surely a wise move during the early years of contact.

Finally, the groups now entering into permanent contact have not been defeated and displaced, but enter the situation with culture intact.

These are excellent developments, unfortunately too late to benefit most of the indigenous peoples of the Americas. Where conscientiously applied, they will greatly benefit the Indian. But the very success of these approaches

in mitigating the thinning-out of the population which formerly occurred following first contacts may be engendering a new set of problems, to which I should now like to direct attention.

The chief contacts of villages just embarking on the cultural transition are currently generally missionaries or government agents. Both groups tend to encourage the Indian to abandon his nomadic way of life, both groups often to afford him a measure of protection, but in addition the government agent because of the complications nomadic groups create in opening an area up for settlement and economic exploitation, the missionary because of the greater opportunity to teach the Gospel. This is entirely understandable. However, Indian sanitation being what it is, an inevitable consequence is a greater accumulation of worm eggs in the soil around the village than when the village's location is shifted frequently, and an increase in the body burden of parasites. With or without an increase in the number of people in the village, the likelihood of water contamination also goes up, and the frequency of transmissible diarrheas.

At the same time, government agents and missionaries tend to discourage the crude methods by which population has been controlled in the past. Again, given the dominant Christian ethic, this is completely understandable. To the extent these efforts are successful, the birth rate increases and the nursing period is shortened. In the inhospitable environment of the jungle or the Mato Grosso, a three year old is much more ready for the transition to solid food than a child of 1 1/2 or 2. One predictable result of an increased birth rate is an increase in malnutrition and the diarrheas of infancy and childhood.

As local population numbers increase, the game situation deteriorates, and the relative availability of good garden sites decreases. This of course

leads to a general decline in nutrition, at the very time that an increased parasite burden calls for good nutrition.

Since national governments are making very real efforts to extend medical services to these newly contacted groups, one can in part counter this somewhat pessimistic scenario with the expectation that these developments will be offset by the vermicides and vermifuges and the broad-spectrum antibiotics. This leads me to my final point: the manner in which the Indian adheres, or fails to adhere to an antibiotic schedule is guaranteed to encourage the emergence of drug-resistant bacteria and parasites. One day he takes the prescribed medicine, or gives it to his child, but if the next day there is no improvement, he turns to folk medicine, only to return to the antibiotic on day 3 if there is still no improvement. Only in the case of injectables can one be sure of a full therapeutic dose.

These observations lead to some relatively simple recommendations, to accompany the now standard ones concerning immunization programs, control of alcohol, etc. Incidentally, none of these recommendations call for any great expenditure of money.

1) Do not encourage groups to settle down or amalgamate into larger groups until the concept of the latrine has gained acceptance.

2) Introduce supplementary crops and domesticated animals as soon as possible, chief among the former being the new strains of maize and among the latter, chickens and pigs.

3) Withhold oral antibiotics unless there is the most binding commitment one can obtain under the circumstances to a full course of therapy. It's difficult to do this with a sick child--one is tempted to gamble that the parents will bring it back the next day--but I am convinced that in the long run this is the wise course.

4) Finally, then, do not disturb those native customs which have limited population growth and kept population numbers reconciled to available resources until adequate provision, as suggested in recommendations 1-3, has been made for population growth. To do otherwise is inhumane.

In closing, firstly I must emphasize that nothing I have said can be interpreted as being critical of persons or governments. Given the totality of the health problems facing Latin America, I feel the public health effort directed towards the Indian is at least proportionate to his numbers, and relatively greater than was characteristic of my own country at a comparable time in its economic developments. I pay tribute to the many fine people laboring to help Indian populations. Secondly, I realize that I am focusing on a relatively few people. I submit, however, that these people pose a special challenge to our conscience, and as symbols of past violations of the brotherhood of man call for a particular effort on our part. Their treatment should of course be dictated by humane considerations, but the investigator in me can't resist commenting on the unique research resource they constitute--our last chance to revisit ourselves evolving. Furthermore, as a geneticist I come to you with a long tradition of focusing on special groups, because of the insights they can provide. Last year dozens of papers were written about galactosemia, or I-cell disease, or type I Lesch Nyhan syndrome or oroticaciduria. The contribution of the gene pool of the Americas represented by the Indian far outweighs the contribution of all these rare diseases combined, and the problems of the Indian are no less pressing--only more remote.