

## TWO TYPES OF NURSING CARE FOR PATIENTS WITH TUBERCULOSIS PRIMARY INFECTION<sup>1</sup>

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*A small study was conducted to assess the effectiveness of home nursing visits in treating Brazilian children with primary tuberculosis infections. The results showed the visits, combined with regular outpatient care, to have a far greater impact than outpatient care alone.*

### Introduction

Tuberculosis is a world health problem. There are 15 to 20 million people in the world suffering from infectious tuberculosis, and over 80 per cent of them are in developing countries (9). In Brazil, tuberculosis is one of the major communicable diseases. It is found in every Brazilian state, including those in the most developed regions with more financial resources and better health care. According to an estimate made in 1965, there were then 400,000 active cases of the disease in Brazil (4).

In 1979, the approximate incidence of tuberculosis in Brazil, according to reports of new cases being treated, was at a level of 5 cases per 1,000 inhabitants, amounting to some 57,000 new cases per year. In fact, however, the actual incidence appears to be somewhat higher—on the order of 100,000 new cases per year. Considering the average duration and lethality of the disease, it therefore appears that there are presently some 300,000 cases of tuberculosis in Brazil (2).

Despite our knowledge of the disease's etiology, therapeutic research, and diagnostic and treatment facilities, tuberculosis still poses a difficult public health problem because of

socioeconomic, cultural, and psychological factors. As a rule, these factors tend to increase the number of people with chronic cases, and these people in turn serve as continuing sources of infection that increase the number of cases of primary infection.

This tuberculosis primary infection, our present subject, is as much a problem as the active disease, not only because it can progress to pulmonary tuberculosis, but also because it can produce a variety of other possible complications. Moreover, the symptoms of primary infection are not obvious, a fact frequently leading to delayed diagnosis and prolonged treatment, as well as to underestimation of the problem by family members.

It is the duty of the public health nurse to provide care for children with tuberculosis primary infections in such a way that their parents or guardians, as well as other relatives, do what is necessary to cope with the disease and to ensure that the treatment received is successful. For this reason it was decided that a study should be conducted to evaluate the relative effectiveness of outpatient and domiciliary nursing care in dealing with cases of tuberculosis primary infection.

### Materials and Methods

The study population consisted of 52 children enrolled with the phthisiological section of Health Center 1 in Ribeirão Prêto's Sixth Regional Health Division. These children were 0 to 12 years of age and had been medi-

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Clinic and field activities related to the Ribeirão Preto tuberculosis study.



cally diagnosed as having a tuberculosis primary infection. The study also took in 157 members of their families. Only children with new and recently diagnosed primary infections were included in the study.

Two groups, designated I and II, were set up, and the study children were assigned to one or the other on the basis of simple random sampling. A total of 27 children were placed in Group I and 25 were placed in Group II.

The first group received nursing care at the health center's outpatient department. This was initiated by an individual interview with the mother or other responsible person<sup>4</sup> accompanying the child. During this interview, which followed the first medical consultation, the following matters were discussed: the nature of tuberculosis primary infection, the importance of getting treatment and returning for medical and nursing checkups, and the responsibility of family members for identifying the source of infection. This latter point was raised in an effort to get everyone living with the infected child to come to the outpatient department for a tuberculin (Mantoux) test and related examinations.

During subsequent visits (following the initial consultation) the attending nurse discussed matters relating to the priorities identified and reinforced the instructions given earlier. Return visits for medical and nursing consultation were scheduled to occur every two months. Home visits were made only to patients who abandoned treatment, and their sole purpose was to get the patient to return to the outpatient department.

The Group II children received the same outpatient care as those in Group I. In addition, each child received periodic domiciliary visits designed to deal with needs identified in the patient's home. That is, the instructions given by the visiting nurse were adapted to the needs of each family in the light of that family's socioeconomic, health, and educational status. No preestablished schedule was set for

giving these instructions, and their sequence was determined by the situation prevailing at the time, the disease prognosis, and the regularity with which the patient was receiving treatment and medical checkups.

Tuberculin (Mantoux) tests for investigating infectious foci were made at the home of the infected child. Referrals for supplementary examinations were made after discussing the importance that finding the source of infection had in terms of the prospects for successful treatment.

### *The Study Samples*

Table 1 shows the distribution by age and sex of the Group I and II children with tuberculosis primary infection. The age distribution was not the same in the two groups, since placement of each child in one or the other group was done by simple random sampling. The largest numbers of Group I children were found in the age ranges 0-2 years (25.9 per cent) and 10-12 years (29.6 per cent), while the largest numbers of Group II children were found in the age ranges 2-4 years (24.0 per cent) and 8-10 years (36.0 per cent). When groups I and II are taken together, the largest numbers of the infected children studied were found in the oldest (8-10 and 10-12) age groups, intermediate numbers were found in the youngest (0-2 and 2-4) age groups, and the lowest numbers were found in the intermediate (4-6 and 6-8) age groups.

As Table 1 also shows, considerably more girls than boys were found in both groups I and II.

### *Family Members and Living Conditions*

Although all of the study children's fathers were gainfully employed, their incomes were low, the monthly income of most (61.5 per cent) of the families being only 60 per cent of the minimum wage (Tables 2 and 3).

With regard to the mothers, most (67.3 per cent) were housewives and were therefore able to care for the child being treated. In this vein,

<sup>4</sup>Usually an aunt or grandmother. On rare occasions the father brought the child in for medical consultation.

Table 1. The children in groups I and II, by age and sex.

| Age group <sup>a</sup><br>(in years) | Group I         |       |       |                             | Group II        |       |       |                              | Total children |       |
|--------------------------------------|-----------------|-------|-------|-----------------------------|-----------------|-------|-------|------------------------------|----------------|-------|
|                                      | No. of children |       |       | % of<br>Group I<br>children | No. of children |       |       | % of<br>Group II<br>children | No.            | %     |
|                                      | Boys            | Girls | Total |                             | Boys            | Girls | Total |                              |                |       |
| 0-2                                  | 2               | 5     | 7     | 25.9                        | 2               | —     | 2     | 8.0                          | 9              | 17.3  |
| 2-4                                  | 1               | 2     | 3     | 11.1                        | 3               | 3     | 6     | 24.0                         | 9              | 17.3  |
| 4-6                                  | —               | 3     | 3     | 11.1                        | —               | 1     | 1     | 4.0                          | 4              | 7.7   |
| 6-8                                  | 1               | 2     | 3     | 11.1                        | 1               | 2     | 3     | 12.0                         | 6              | 11.5  |
| 8-10                                 | 1               | 2     | 3     | 11.1                        | 2               | 7     | 9     | 36.0                         | 12             | 23.1  |
| 10-12                                | 3               | 5     | 8     | 29.6                        | —               | 4     | 4     | 16.0                         | 12             | 23.1  |
| Total                                | 8               | 19    | 27    | 100.0                       | 8               | 17    | 25    | 100.0                        | 52             | 100.0 |

<sup>a</sup>These age intervals are open-ended to the left, so that a child exactly 2 years old would be included in the 2-4 group.

Table 2. Monthly per capita income of the study families, calculated by adding the incomes of all working family members and dividing by the total number of household residents.

| Monthly per capita income as a percentage of the minimum wage <sup>a, b</sup> | Monthly per capita income in cruzeiros <sup>b</sup> | No. | % of total |
|---|---|-----|------------|
| 0-20  | Cr\$ 0 - 75.36                                      | 3   | 5.8        |
| 20-40   | Cr\$ 75.36-150.72                                   | 18  | 34.6       |
| 40-60   | Cr\$150.72-226.08                                   | 11  | 21.2       |
| 60-80   | Cr\$226.08-301.44                                   | 9   | 17.3       |
| 80-100  | Cr\$301.44-376.80                                   | 8   | 15.4       |
| ≥ 100   | ≥ Cr\$376.80  | 3   | 5.8        |
| Total   |   | 52  | 100.0      |

<sup>a</sup>The minimum wage at the time of the study (1975) was Cr\$376.80 per month.

<sup>b</sup>These scales are open-ended to the left, so that a family with an income of exactly Cr\$75.36 would be included in the 75.36-150.72 group.

Table 3. Occupations of the study children's parents.

| Occupation         | Fathers         |       | Mothers |       |
|--------------------|-----------------|-------|---------|-------|
|                    | No.             | %     | No.     | %     |
| Housewife          | —               | —     | 35      | 67.3  |
| Domestic servant   | —               | —     | 7       | 13.5  |
| Laundress          | —               | —     | 4       | 7.7   |
| Driver             | 7               | 15.2  | —       | —     |
| Mason              | 5               | 10.9  | —       | —     |
| Military policeman | 3               | 6.5   | —       | —     |
| Watchman           | 4               | 8.7   | —       | —     |
| Mechanic           | 3               | 6.5   | —       | —     |
| Hotel clerk        | 2               | 4.3   | —       | —     |
| Contractor         | 2               | 4.3   | —       | —     |
| Municipal employee | 2               | 4.3   | —       | —     |
| Bar owner          | 2               | 4.3   | —       | —     |
| Other              | 16              | 34.8  | 6       | 11.5  |
| Total              | 46 <sup>a</sup> | 100.0 | 52      | 100.0 |

<sup>a</sup>Six children were fatherless.

it should be noted that many of the study children were preschoolers totally dependent on maternal care. This is a very important consideration, because it means that treatment depends almost entirely upon what value those caring for the children place on diet and administration of the proper drugs, as well as on the need to prevent active foci from existing within the household.

As Table 4 indicates, most of the parents (51.0 per cent) had only partial primary schooling; an additional 35.7 per cent were

considered only semi-literate; and 6.1 per cent were illiterate. Therefore, it may be said that virtually all of the study children came from low-income families with limited schooling.

Most of the children's homes were of brick and had electric lights; 76.9 per cent had piped water; 63.5 per cent had indoor sanitary facilities; and 67.3 per cent contained at least four small rooms.

With respect to sleeping arrangements, all but two of the study children slept indoors; 61.5 per cent had their own beds, while the

Table 4. Educational backgrounds of the study children's parents.

| Literacy and schooling   | Fathers |       | Mothers |       | Total |       |
|--------------------------|---------|-------|---------|-------|-------|-------|
|                          | No.     | %     | No.     | %     | No.   | %     |
| Illiterate               | 3       | 6.5   | 3       | 5.8   | 6     | 6.1   |
| Semi-literate            | 16      | 34.8  | 19      | 36.5  | 35    | 35.7  |
| Some primary education   | 24      | 52.2  | 26      | 50.0  | 50    | 51.0  |
| Primary school graduate  | —       | —     | 2       | 3.8   | 2     | 2.0   |
| Some secondary education | 3       | 6.5   | 2       | 3.8   | 5     | 5.1   |
| Total                    | 46      | 100.0 | 52      | 100.0 | 98    | 100.0 |

other 38.5 per cent slept with their parents or siblings.

Home hygiene in most cases was poor. In this vein, some 50 per cent of the families dumped their garbage on vacant land—a practice suggesting ignorance of hygiene's relationship to health and the basic principles of sanitation.

Obviously, it is very hard to make such families grasp the importance of an existing health threat such as, in this case, tuberculosis. That is, ignorance creates a major obstacle that discourages them from pursuing proper treatment and taking other measures needed for fully successful resolution of the problem. Therefore, such families need a strong inducement to respond to the recommendations received from the health center, and this inducement cannot always be provided at the outpatient department—where the mother may either hide the truth or distort it. This leads to a conviction that nursing care must be provided in the home, where the nurse can get a more accurate picture of the problem, can make a more accurate diagnosis, and can determine the instructions to give and the practices to establish in accord with an appropriate scale of priorities.

## Results and Discussion

### Group I

There was a relatively high incidence of absenteeism among the Group I children who

received nursing care at the outpatient department. Among other things, this resulted in many coming in on days other than those scheduled—which tended to interfere with the work routine of the department and sometimes with the pattern of instruction. Indeed, on one day the backlog of consultations became so great that the time allocated for each consultation was reduced. In addition, Group I children often appeared at the health center accompanied by older brothers and sisters to seek medication. During the subsequent visits, the average length of each nursing follow-up consultation was 15 minutes.

When asked about the reasons for nonattendance, family members said they had forgotten, lacked transportation, were unable to leave work, or found the child rejected the medication.

### Group II

The Group II children received the same outpatient care, supplemented by home visits. During these visits the instructions and demonstrations given at the health center were repeated, and the child's ingestion of medication was carefully controlled—the tablets remaining in the bottle being counted and compared with the number that should have been left as of that visit.

The source of infection was carefully investigated. Knowing the health conditions of the environment, the number of people living in the home, and the location of these other residents, neighbors, and relations, the nurse

could work with the family to successfully pinpoint possible sources of infection. The nurse then discussed the matter with these possible sources in order to encourage them to take a Mantoux and other supplementary tests, and to attend the health center in cases where such a visit was indicated. None of these steps were carried out in conjunction with treatment given the Group I children; and possible carriers, instead of being motivated directly to come in, were merely informed of the need by the mothers of the infected children.

#### *Interrupted or Abandoned Treatment*

With respect to duration and completion of treatment, the data in Tables 5 and 6 show that notably better results were obtained with the Group II children than with those in Group I. All of the Group II children completed their prescribed courses of treatment (16 per cent completing three-month regimens, 4 per cent completing a six-month regimen, and 80 per cent completing twelve-month regimens). In contrast, 3.7 per cent of the Group I children completed a three-month regimen, 18.5 per cent completed six-month regimens, 44.4 per cent completed twelve-month regimens, and 33.3 per cent did not complete their prescribed regimens.

The record of treatment interruption and abandonment, by group, is shown in Table 6. Treatment was considered complete and uninterrupted when the children came in regularly to receive medical checkups and medication.

Those who failed to come in for the medical checkups and medication, but who did not abandon treatment altogether, were included in the "interrupted complete treatment" group. Those who failed to come in and, following notification, did not appear for a period of three months, were considered to have abandoned treatment. All nine of the children who abandoned treatment were members of Group I.

#### *Other Experiences*

Other work involving both direct education of family members and continuing supervision has shown that the rate of treatment abandonment could be reduced to less than 10 per cent (6). Castro Filho et al. (4) have stated that the controlled use of drugs, prescribed in the correct quantities, is a favorable consequence of the tuberculosis control program. And Nascimento and Lima (8), referring to the percentage of cured cases relative to the total number of files closed for various reasons, have stated that cures should account for 90 per cent of the files closed in any given year.

#### *Identification of Active Cases*

The purpose of tuberculosis control is to interrupt the chain of infection, and this can best be done by detecting active foci (7). Overall, as Table 7 shows, it appears that the

**Table 5. The numbers of study children completing three-month, six-month, or twelve-month courses of treatment or abandoning treatment, by group.**

| Length of treatment | Group I (outpatient) children |       | Group II (home visit) children |       |
|---------------------|-------------------------------|-------|--------------------------------|-------|
|                     | No.                           | %     | No.                            | %     |
| 3 months            | 1                             | 3.7   | 4                              | 16.0  |
| 6 months            | 5                             | 18.5  | 1                              | 4.0   |
| 12 months           | 12                            | 44.4  | 20                             | 80.0  |
| Treatment abandoned | 9                             | 33.3  | —                              | —     |
| Total               | 27                            | 100.0 | 25                             | 100.0 |

**Table 6. Record of treatments completed without interruption, interrupted but completed treatments, and abandonment of treatment by Group I and Group II children.**

|  | Group I |       | Group II |       |
|--|---------|-------|----------|-------|
|  | No.     | %     | No.      | %     |
| Treatment completed without interruption | 14      | 51.9  | 21       | 84.0  |
| Treatment interrupted but completed      | 4       | 14.8  | 4        | 16.0  |
| Treatment abandoned                      | 9       | 33.3  | —        | —     |
| Total                                    | 27      | 100.0 | 25       | 100.0 |

**Table 7. Sources of tuberculosis infection located among the families of Group I and Group II children, by the relationship of the source to the child.**

| Relationship of source | Group I |      | Group II |      |
|------------------------|---------|------|----------|------|
|                        | No.     | %    | No.      | %    |
| Father                 | —       | —    | 6        | 24.0 |
| Mother                 | 1       | 3.7  | —        | —    |
| Sibling                | 1       | 3.7  | 6        | 24.0 |
| Aunt or uncle          | 4       | 14.8 | 3        | 12.0 |
| Cousin                 | —       | —    | 2        | 8.0  |
| Nephew                 | 3       | 11.1 | 5        | 20.0 |
| Total detected         | 9       | 33.3 | 22       | 88.0 |

active cases responsible for infecting 22 (88 per cent) of the Group II children were detected. In contrast, only active cases responsible for infecting nine (33 per cent) of the Group I children appear to have been identified. The highest incidences of active cases were found among people who lived with the children, followed by people who frequently visited their homes.

This marked difference in the rates at which active cases related to Group I and Group II children were detected can be attributed to the comparatively large number of people who came in for examination because they were

identified by the careful search of a visiting nurse as being a possible source of the infection. The same process did not occur in connection with the Group I cases, and the rate at which people came in for examination was far lower. Furthermore, since contact with other members of the family was more extensive in Group II, if the indicated examinations and discussions did not uncover the focus of infection among those immediately involved, new clues leading to other people were pursued. This could not be done for Group I patients seen at the outpatient department, where the discussions held were always with the same individuals.

### Concluding Remarks

It was thought possible that absence of the mother from the household could have accounted for these differences in detection of active cases and completion of treatment. However, the data show that 63 per cent of the mothers in Group I and 78 per cent of those in Group II were housewives. The 15 per cent difference is insufficient to support the argument that a higher rate of maternal absence played much of a role in the markedly different results obtained. In the nine cases where treatment was abandoned, the event was attributed to lack of maternal motivation, despite the fact that each mother was notified several times.

Overall, it appears that domiciliary nursing care of the study children was more effective than outpatient care for the following reasons: (1) It permitted detection of many more foci of infection than did outpatient treatment. (2) It led to *uninterrupted* completion of treatment by 84 per cent of the children, as compared to uninterrupted completion by only 52 per cent of the children in the outpatient group. And (3) it led to ultimate completion of treatment by all of the children; in contrast, a third of the children in the outpatient group abandoned treatment.

## SUMMARY

Socioeconomic, cultural, and psychological factors make tuberculosis a difficult public health problem, as demonstrated in Brazil by the existence of an estimated 300,000 tuberculosis cases. For this reason a small study was conducted in Ribeirão Preto, Brazil, to help determine the relative merits of different kinds of nursing care for children identified as having a primary tuberculosis infection. The two types of care assessed were treatment administered at an outpatient department and this same treatment combined with periodic nursing visits to the children's homes.

The study showed a marked difference between

the results obtained with 27 children treated only at the outpatient department (Group I) and 25 children who received periodic home visits (Group II). A third of the former, as compared to none of the latter, abandoned treatment; and even among those who completed treatment, a higher percentage of Group I children interrupted their treatment at some point in the process. The home visits also made it possible to detect most of the active cases that had infected the study children, while the outpatient department alone was only able to pinpoint about a third of these infectious cases.

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