A Study of Re-treatment Cases vs Original Treatment Cases of Pulmonary Tuberculosis*.

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A primary problem in the current treatment of pulmonary tuberculosis is the ever-increasing number of patients who have had interrupted periods of antimicrobial therapy. The chemotherapeutic era in tuberculosis now extends well over 10 years. Re-exacerbations are occurring, particularly among the early, inadequately treated patients. Quite as importantly, case-finding efforts are spreading to include the elderly, homeless, indigent, alcoholic whose instability precludes long-term, continuous therapy.

To assess the impact of these changing conditions upon modern treatment, it was decided, therefore, to analyze the consecutive admissions over a two-year period in this large municipal sanatorium with particular attention to possible differences in the background of original and repeat admissions, their response to treatment and the time factor in such differences as were found to exist.

Material and Methods

During the two calendar years from January 1, 1955 to December 31, 1956, 1213 adult males were admitted to William H. Maybury Sanatorium: 712 as original, 501 as re-treatment patients. Fifty of the total group were found to be non-tuberculous, 25 had extrapulmonary disease, leaving 1138 with pulmonary tuberculosis for analysis. Of these, 643 (56.5 per cent) were original treatment and 495 (43.5 per cent) were repeat treatment cases, hereinafter referred to as “originals” and “repeats,” respectively.

Originals, by definition, were virgin treatment cases. Repeats included two types: 1) those who had received prior antituberculosis drug therapy with known interruption of more than 21 days, and 2) transfers to the sanatorium among whom continuity of therapy could not be established. Abscondees with less than three weeks’ interruption of therapy were returned to classification with the originals.

The backgrounds of the two groups of patients were studied as regards age, color, vocation, marital status, alcoholism, complications, classification and duration of disease, cavitation, sputum status, and types and numbers of prior admissions. Response to treatment in the sanatorium was measured at six-month observation periods in terms of x-ray change, cavity closure, sputum conversion, and success or failure in reaching treatment objectives. Finally, comparison of the status of the two groups was made at the point of latest sanatorium observation, December 31, 1957 or before when discharge, transfer or death terminated the hospital stay.

All patients received the types of antimicrobial therapy commonly used in the sanatorium during 1955-56 (i.e., various combinations of isoniazid,

*Wm. H. Maybury Sanatorium.
PAS, and streptomycin, with additional preparations in cases of poor response or in problems of research). No attempt is made in this presentation to evaluate differences in response to various chemotherapeutic regimens or to follow the fate of the patients in the post-sanatorium period. Attention was directed to differences between originals and repeats at various periods of in-sanatorium observation with particular attention to the timing and significance of such differences as were found to occur.

**Background Data**

Age: The average age of all adult admissions in 1955-6 was 50.13 years. The originals averaged 51.1 years, the repeats 48.9 years. There were slightly lower percentages of originals in age groups through 64 years but 8 per cent more in the bracket of 65 and over.

Color: Three-fourths of the entire group were white: 77 per cent of the originals and 73 per cent of the repeats. In general a higher proportion of the older men were white, of the younger men non-white.

Vocation: Four-fifths of the total group were unskilled laborers: 79 per cent of the originals and 83 per cent of the repeats.

Marital Status: There was striking difference in the marital status of the two groups. Thus 58 per cent of the originals were unmarried (single, separated, divorced, or widowers) while nearly three-fourths (73.5 per cent) of the repeats were unmarried. This significant difference illustrates the recognized stabilizing influence of the wife and home on the behavior of hospitalized patients. Conversely the relatively more unstable repeater had experienced little more success in maintaining his home and marriage than in dealing successfully with the problems surrounding his tuberculosis.

Alcoholism: Here again there was marked difference in the background of the two groups. Nearly half (49.9 per cent) of the repeats but only one-quarter (28 per cent) of the originals were alcoholics. Alcoholism is defined here as the repeated excessive use of alcohol before or during hospitalization. It was a severe disciplinary problem, a serious impediment to cooperation, and a major factor in the frequent breaks in continuity of treatment among the repeats.

Complications: The presence of associated extrapulmonary tuberculous disease was about 7 per cent in each group, but non-tuberculous complications (silicosis, diabetes, non-pulmonary malignancy, gastric resection and other) totalled 11.6 per cent among the originals, only 4.5 per cent in the repeats. Pulmonary emphysema was prevalent in both.

Classification of tuberculous disease: The classification of pulmonary disease revealed less group difference than had been anticipated. On admission 10 per cent of the originals had minimal, 41 per cent moderately advanced and 49 per cent far advanced disease; among the repeats there were 6 per cent with minimal disease, 39 per cent moderately advanced and 55 per cent far advanced. In general the repeats had somewhat more fibrotic disease than their original treatment cohorts.

Cavitation: The admission chest films of 65 per cent of the originals and 58 per cent of the repeats were read as showing cavitation, reflecting in the latter group the effect of prior treatment. Fewer cavities of both small and large size were recorded among the repeats. Thirty-seven per
TABLE I
PATIENTS UNDER SANATORIUM OBSERVATION IN EACH PERIOD

<table>
<thead>
<tr>
<th>Months</th>
<th>Original</th>
<th>Repeat</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>642</td>
<td>495</td>
<td>1138</td>
</tr>
<tr>
<td>12</td>
<td>424</td>
<td>283</td>
<td>707</td>
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<tr>
<td>18</td>
<td>262</td>
<td>184</td>
<td>446</td>
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<tr>
<td>24</td>
<td>111</td>
<td>96</td>
<td>207</td>
</tr>
<tr>
<td>30</td>
<td>44</td>
<td>61</td>
<td>105</td>
</tr>
<tr>
<td>30+</td>
<td>11</td>
<td>17</td>
<td>48</td>
</tr>
</tbody>
</table>

cent of the originals and 34 per cent of the repeats had cavities less than 4 cm. in total diameter. Cavities totalling 4 cm. or over were recorded in 27 per cent of the originals and 24 per cent of the repeats. Presence of cavitation and the size thereof are based on the reports of roentgenologist Carl C. Birkelo, M.D.

Sputum Status: Surprisingly, 71 per cent of the originals and only 48 per cent of the repeats were positive directly or by culture on admission studies. This is again a reflection of prior treatment, some of it recent, among the latter group.

Types of Prior Discharge: Of the repeats, 17 per cent had been discharged with approval from a tuberculosis sanatorium many months to several years previously. Sixteen per cent had been transferred from another institution but with interruption of treatment sometime previously; 67 per cent had absconded from the institution of prior treatment.

Number of Periods Prior Treatment: Thirty per cent of the repeats had had three or more periods of prior treatment and 5 per cent had had six or more hospitalizations; one patient had had 13 prior periods of therapy. The majority however (70 per cent), had had only one or two previous periods of treatment. As noted previously, periods of less than 21 days out of the hospital were not counted as interruptions of treatment.

Time Elapsed since First Treatment: The chronicity of disease among the repeat patients was outstanding. In half of this group (51 per cent) more than two years had elapsed since their disease had first been treated and one-fourth (24 per cent) had had their disease for more than five years. Eleven per cent had received collapse therapy, four per cent resectional surgery and three per cent thoracoplasty.

The typical repeat treatment patient, then, was a white man, 49 years of age, unskilled, unmarried, alcoholic, with positive sputum and far advanced fibro-cavitary disease of two years' duration, an abscondee with one or two periods of previous therapy. The original treatment patient on the other hand was slightly older, also unmarried, non-alcoholic, with slightly less extensive, more exudative disease.

Comparison of Results

Observations on roentgenologic and bacteriologic changes and the status of the patients were made at six-month intervals after the beginning of therapy on all patients remaining in the sanatorium. Table I lists the number of patients by group and in total, under sanatorium observation
during each period. The status of the patients' roentgenologic and other changes was further recorded at the date of last observation in the sanatorium, December 31, 1957 or before. Using these two methods of evaluation, marked differences as well as certain similarities in the results of treatment were observed in the original and repeat treatment patients.

Periodic Observations

In this section dealing with periodic observations, cumulative figures obviously are impossible due to the attrition in both groups from discharge, transfer, death, and absconding. In Tables I to III and Figures 1 through 4 the numbers listed at six-month intervals relate specifically to the numbers of patients under observation in each period. Attention is thus focused on the fate of remaining in-sanatorium patients.

Discharge and Surgical Transfer—Objective Reached

Interesting differences between the two groups are seen in the rates of discharge and surgical transfer, the two categories of "objective reached." Originals remaining in the sanatorium are discharged with medical approval at an increasing rate up to the 24th month (Table II). A sizeable number of repeats are discharged early, this group being made up largely of erroneously suspected relapses and abscondees who had been nearly ready for discharge before leaving the institution, but the rate drops off rapidly after the 12th month.

Early surgical transfers (Figure 1) among repeats consist largely of patients who accept surgery after readmission, having absconded previously to avoid it. After 18 months, however, surgical salvage among repeats is extremely low. In contrast, originals remaining in the sanatorium continue to be brought to surgery in high proportion even up to 30 months.

Absconded: The proportion of abscondees among the repeats was roughly twice that of the originals (Table III) reflecting a continuance upon readmission of previously demonstrated behavioral patterns and attitudes. Alcoholism, emotional instability and marital separation are
important factors in the difference in abscond rates. Ninety per cent of absconds in both groups leave within the first 18 months after admission; among repeats, about half the absconds are within the first six months.

Deaths: Marked differences between the two groups are apparent in an analysis of deaths. Eighty-six deaths from all causes occurred among the 1138 patients under observation, 56 (9 per cent) among the originals and 30 (or 6 per cent) among the repeats.

Non-tuberculous causes accounted for 33 (38.4 per cent) of the deaths, 23 of these deaths occurring among the originals and 10 among the repeats. In order of frequency, extrapulmonary carcinoma, renal disease, pneumonia, pulmonary embolism, cardiac disease, pulmonary carcinoma and cerebrovascular accidents were causes of non-tuberculous deaths.

<table>
<thead>
<tr>
<th>Months</th>
<th>Original Number</th>
<th>Original Per Cent</th>
<th>Repeat Number</th>
<th>Repeat Per Cent</th>
<th>Total Number</th>
<th>Total Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>70 - 11</td>
<td></td>
<td>130 - 26</td>
<td></td>
<td>200 - 18</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>56 - 13</td>
<td></td>
<td>66 - 23</td>
<td></td>
<td>122 - 17</td>
<td></td>
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<tr>
<td>18</td>
<td>33 - 13</td>
<td></td>
<td>39 - 21</td>
<td></td>
<td>72 - 16</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>12 - 11</td>
<td></td>
<td>13 - 14</td>
<td></td>
<td>25 - 12</td>
<td></td>
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<tr>
<td>30</td>
<td>3 - 7</td>
<td></td>
<td>14 - 23</td>
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<td>17 - 16</td>
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<tr>
<td>30+</td>
<td>0 - 0</td>
<td></td>
<td>1 - 6</td>
<td></td>
<td>1 - 2</td>
<td></td>
</tr>
</tbody>
</table>
There were 53 deaths from pulmonary tuberculosis, 33 among the originals and 20 among the repeats.

The time factor in deaths is of interest. Of the 86 deaths from all causes in both groups, 48 (56 per cent) occurred within three months after admission, 59 (60 per cent) within six months and 76 (88 per cent) within the first 12 months after admission.

Twenty-six (76 per cent) of the 33 deaths from pulmonary tuberculosis among the originals occurred within the first three months following admission, which we interpret as being due to overwhelming disease on admission resulting in death of the patients before antimicrobial therapy could be effective. Only six (30 per cent) of the 20 tuberculous deaths among the repeats, however, occurred within the first three months.

Significantly, during later months of hospitalization only seven deaths (24 per cent) occurred among originals and 14 (70 per cent) among the repeats. Thus, percentage-wise, deaths after three months of therapy occurred nearly three times as frequently among the repeats. The twin factors of bacillary resistance and ineffective chemotherapy in the repeats are important here.

Sixty per cent of all tuberculosis deaths in the series occurred in the first three months of hospitalization; 48 per cent of all non-tuberculosis deaths also occurred in this period.

X-ray Change: One of the most striking differences between the two groups lies in the degree and rate of x-ray change. As seen in Figure 2, at each time interval a far greater proportion of originals showed moderate or marked x-ray improvement. More repeats showed slight or no improvement. An alarmingly greater proportion of repeats showed x-ray worsening during the later observation periods. These differences relate directly to the more exudative nature of original treatment lesions and to breaks in continuity of therapy and excessive bacillary resistance in the repeat group.
TABLE IV
CAVITY CLOSURE
(Per Cent of Admission Cavities)

<table>
<thead>
<tr>
<th></th>
<th>Original</th>
<th>Repeat</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Number</td>
<td>Number</td>
</tr>
<tr>
<td></td>
<td>Per Cent</td>
<td>Per Cent</td>
<td>Per Cent</td>
</tr>
<tr>
<td>All Sizes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closed in 12 months</td>
<td>155 - 37</td>
<td>70 - 24</td>
<td>225 - 32</td>
</tr>
<tr>
<td>Closed after 12 months</td>
<td>31 - 7</td>
<td>9 - 3</td>
<td>40 - 6</td>
</tr>
<tr>
<td>Under 4 Cm.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closed in 12 months</td>
<td>115 - 50</td>
<td>58 - 35</td>
<td>173 - 44</td>
</tr>
<tr>
<td>Closed after 12 months</td>
<td>13 - 6</td>
<td>6 - 4</td>
<td>19 - 5</td>
</tr>
<tr>
<td>Over 4 Cm.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closed in 12 months</td>
<td>40 - 21</td>
<td>12 - 9</td>
<td>52 - 16</td>
</tr>
<tr>
<td>Closed after 12 months</td>
<td>18 - 9</td>
<td>3 - 2</td>
<td>21 - 7</td>
</tr>
</tbody>
</table>

Cavity Closure: There is important difference, too, in the number of cavity closures. Period by period, a significantly higher proportion of the originals still under observation closed their cavities (Figure 3). Half of the number of cavities in both groups which eventually were to close had done so by the sixth month. The proportion of closed cavities at that time, however, was twice as high among the original treatment patients (23 versus 13 per cent).

Table IV lists data regarding cavity closure in the two groups in relation to time and cavity size.

The 12-month time interval was critical as regards cavity closure. Thirty-two per cent of all cavities in both groups had closed by the 12th month; only six per cent closed thereafter. This is an all-important factor to be considered in timing surgical intervention.
Total diameter of cavities on admission related inversely to eventual cavity closure. Thus, 49 per cent of all cavities in both groups under 4 cm. closed without surgery but only 23 per cent of those over that diameter. Regardless of cavity size, significantly less cavity closure occurred among the repeats (44 versus 27 per cent).

Sputum Conversion: Period by period, a considerably higher percentage of sputum conversions occurred among the originals still under observation (Figure 4). This difference was somewhat less marked, however, than were x-ray changes and cavity closure.

The bulk of sputum conversions had occurred by the sixth month; the 12-month period was critical in this regard. Sixty-eight per cent of all admission-positive patients converted their sputum by the 12th month, but only 5 per cent thereafter. This again is an important factor in timing surgical intervention.

Bacillary Resistance: At all periods of observation, a high percentage of positive-sputum repeat patients yielded tubercle bacilli resistant to one or more of the major antimicrobials (Table V). Moreover, the proportion of positive-sputum repeats with resistant bacilli was significantly higher at each time interval than was the case with the originals. This undoubtedly played an important role in the differential response to therapy. After 18 months, however, practically all positive patients in both groups were resistant to the major antimicrobials with which they had been treated.

**Final Status**

The preceding analysis has dealt with periodic observations on the two groups of patients at six-month intervals during their course of treatment. Even more informative in pointing up differences in response to therapy is the analysis of the status of the patients at the last point of observation in the sanatorium, December 31, 1957, or before.

![Figure 4: Time of Sputum Conversion](http://journal.publications.chestnet.org/pdfaccess.ashx?url=/data/journals/chest/21324/)
TABLE V
BACILLARY RESISTANCE
(Per Cent of Positive-Sputum Patients under Observation)

<table>
<thead>
<tr>
<th></th>
<th>Original Number</th>
<th>Repeat Number</th>
<th>Total Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Per Cent</td>
<td>Per Cent</td>
<td>Per Cent</td>
</tr>
<tr>
<td>Adm.</td>
<td>70 - 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 months</td>
<td>30 - 22</td>
<td>75 - 54</td>
<td>105 - 39</td>
</tr>
<tr>
<td>12 months</td>
<td>21 - 45</td>
<td>50 - 76</td>
<td>71 - 63</td>
</tr>
<tr>
<td>18 months</td>
<td>21 - 75</td>
<td>42 - 82</td>
<td>63 - 80</td>
</tr>
<tr>
<td>24 months</td>
<td>11 - 100</td>
<td>19 - 87</td>
<td>30 - 91</td>
</tr>
<tr>
<td>30 months</td>
<td>7 - 100</td>
<td>14 - 88</td>
<td>21 - 91</td>
</tr>
<tr>
<td>30 months plus</td>
<td>1 - 100</td>
<td>6 - 100</td>
<td>7 - 100</td>
</tr>
</tbody>
</table>

Final Status: Figure 5 shows the status at last observation of the 643 originals and 495 repeats. Twenty per cent of the former and 17 per cent of the latter had received their discharge. As noted before, a sizeable proportion of the repeat treatment group received early discharge because of failure to verify erroneously suspected re-exacerbation and because many had been nearly ready for discharge when they had previously absconded. Twelve per cent of original treatment patients were transferred for surgery, only 7 per cent of the repeats, a significant and important difference. Thus the twin objectives of discharge or surgical transfer were reached in one-third of the originals (32 per cent) and in only one-fourth (24 per cent) of the repeat group. Approximately equal proportions of each group (32 and 30 per cent respectively) were in the sanatorium or had been transferred for non-surgical reasons.

Death occurred in 9 per cent of the original treatment and 6 per cent of the repeat treatment patients. These figures relate directly to the

**FINAL STATUS**

**ORIGINAL**

- SUCCESS
- UNDER Rx.
- FAILURE

**REPEAT**

- SUCCESS
- UNDER Rx.
- FAILURE

PERCENT OF TOTAL NUMBERS.

FIGURE 5
acute, pre-terminal condition of many first admissions and the more chronic disease of the average repeat admissions. Absconding was far more prevalent among those with previously interrupted therapy. Forty per cent of the repeat group absconded, frequently more than once, while only 27 per cent of the originals left against advice. Failure in therapy (death and absconding) thus occurred in 36 per cent of the originals and 46 per cent of the repeats.

X-ray Change, Final: One of the most pronounced differences in results of therapy is seen in the degree of x-ray change at last observation (Figure 6). Moderate to marked x-ray improvement occurred in 40 per cent of the originals but in only 11 per cent of the repeats; zero to slight improvement occurred in 59 per cent of originals, versus 83 per cent of repeats. X-ray worsening was observed in 6 per cent of repeats but in only 0.2 per cent of the originals. Again these figures relate to the more exudative nature of the disease, to better patient cooperation and to less frequent bacillary resistance in originally treated patients.

Cavity Status, Final: There were definite differences as regards cavity closure and diminution in cavity size (Figure 7). At the start of therapy 35 per cent of the original and 42 per cent of the repeat cases showed no cavitation; on final observation 66 per cent of the original and 60 per cent of the repeat patients had no cavities. At last observation a comparable percentage of patients in both groups had cavities under 4 cm. in total diameter. Among the originals, as a result of treatment, there was marked reduction in the number of patients with persistent cavitation greater than 4 cm.; this response was much less marked among the repeats.

Significantly, nearly half (44 per cent) of all original treatment cavities closed under medical therapy, only a quarter (27 per cent) of all retreatment cavities did so. Nearly three times as many large cavities (4 cm. or over) closed among original as among repeat cases. In both groups, however, no cavity larger than 7 cm. was observed to close nor did cavities close with total diameter greater than 7 cm.

X-RAY CHANGE

ORIGINAL

GOOD IMPR
LITTLE OR NO IMPR

REPEAT

GOOD
LITTLE OR NO IMPR

10 30 50 70 90
PERCENT OF TOTAL NUMBER

FIGURE 6
The fate of cavities which did not close is of interest. In original treatment cases only 3 per cent of cavities (all sizes) enlarged but in the repeats 9 per cent of small cavities (under 4 cm.) and 15 per cent of large cavities (4 cm. or over) became larger. Moreover, cavity enlargement among the originals was frequently associated with negative sputum and clearing of infiltrations—the result of excavation of caseous areas. In the repeat group, however, cavity enlargement was associated for the most part with x-ray worsening, positive sputum and bacillary resistance, constituting real progression of disease.

Sputum Status, Final Observation (Figure 8): At the beginning of therapy, 71 per cent of the original and 48 per cent of the repeat cases were positive on direct examination and/or culture. At last observation 13 per cent and 20 per cent, respectively, remained positive, a creditable response in both groups. Significantly, however, sputum conversion occurred in 81 per cent of the admission-positive originals and only 58 per cent of the admission-positive repeat cases.
**TABLE VI**

BACILLARY RESISTANCE VERSUS CAVITATIONS

<table>
<thead>
<tr>
<th></th>
<th>Original Number</th>
<th>Repeate Number</th>
<th>Total Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Per Cent</td>
<td>Per Cent</td>
<td>Per Cent</td>
</tr>
<tr>
<td>No cavitation</td>
<td>3/218 - 1</td>
<td>2/196 - 1</td>
<td>5/ 414 - 1</td>
</tr>
<tr>
<td>Cav. orig. &lt; 4 cm. remaining open</td>
<td>4/  91 - 4</td>
<td>16/100 - 16</td>
<td>20/ 191 - 10</td>
</tr>
<tr>
<td>Cav. orig. &gt; 4 cm. remaining open</td>
<td>17/109 - 16</td>
<td>46/102 - 45</td>
<td>63/ 211 - 30</td>
</tr>
<tr>
<td>Cav. orig. &lt; 4 cm. closing</td>
<td>3/123 - 2</td>
<td>1/ 63 - 2</td>
<td>4/ 186 - 2</td>
</tr>
<tr>
<td>Cav. orig. &gt; 4 cm. closing</td>
<td>0/ 56 - 0</td>
<td>0/ 15 - 0</td>
<td>0/  71 - 0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>27/597 - 4.4</strong></td>
<td><strong>65/476 - 13.7</strong></td>
<td><strong>92/1073 - 7.8</strong></td>
</tr>
</tbody>
</table>

Of the 124 original treatment patients still in the sanatorium December 31, 1957 only six (4 per cent) were still positive. Of the 98 repeat patients who still remained, 24 (26 per cent) were still positive. All 30 of these patients were resistant to the major antimicrobials.

Bacillary Resistance: In both groups development of bacillary resistance was directly proportional to the size and persistence of admission cavities (Table VI). Resistance was negligible when cavities closed but mounted rapidly when cavities remained open, particularly those of large diameter. Moreover, resistance developed three to four times as frequently in the retreatment patients and mitigated against their clinical recovery.

**DISCUSSION**

With the advent of generally accepted regimens of antimicrobial therapy for original-treatment patients, the problem of the patients with prior periods of therapy assumes major medical importance.

Nor is this a static problem. Nearly half of the adult admissions to Maybury Sanatorium (and doubtless to other large metropolitan sanatoria) are prior-treatment patients, and the percentage increases year by year.

Several factors are responsible for this increase in repeat admissions. Case finding efforts now extend to the lower strata of society: to the indigent, homeless, unskilled, unmarried alcoholics whose experiences have left them restless, rebellious and mobile. Also contributory, though in minor proportion, are breakdowns among early inadequately-treated patients.

Paradoxically, antimicrobials contribute in themselves to the problem of retreatment. Chemotherapeutic agents are sufficiently effective to preserve and prolong life but are not sufficiently effective to prevent in all cases the later necessity for retreatment. Moreover, chemotherapy, particularly in its early days, has made difficult the attainment of mature surgical judgment.

From the standpoint of native host resistance, retreatment cases are a select group. Despite multiple breaks in therapy continuity, these individuals constitute a portion of the survivors from a somewhat larger group of initially treated patients, many of whom succumbed to their tuberculous disease. As shown in this study, the retreatment case is less positive, more resistant, less cavitary and more fibrotic and so less likely to respond to therapy. Important, too, are certain human traits presented by these retreatment patients which make them less cooperative and less conscientious in regard to treatment. Notwithstanding these facts the degree of success in treating these repeat cases is reasonably acceptable, due mainly to therapy regimen manipulation and to surgery. But failures are prominent and possibly contribute toward keeping the retreatment problem from becoming unduly extensive.

The value of judicious antimicrobial therapy is shown by the sputum conversion rate among the retreatment positives, but this is not paralleled by cavity closure or...
x-ray resolution. Thus there is generated at the same time both the physician's reluctance toward discharge and the patient's sense of false security, leading eventually to discharge against advice. Eternal patient education thus becomes a necessity.

Bacillary resistance to antimicrobials is a much more serious factor in retreatment patients and contributes measurably to lack of improvement or worsening and to the higher death rate from tuberculosis in this group after three months. The relationship of bacillary resistance to unclosed cavities should be a warning to employ surgical measures at the earliest time indicated in persistent cavity cases: before the 12th month if possible, after which few cavities in our series closed without surgery. This thought applies even more emphatically in cavities over 4 cm. in diameter.

As compared with the original treatment cases in this series, the retreatment patients showed: less x-ray resolution, cavity closure and sputum conversion; and more x-ray worsening, bacillary resistance and deaths after three months' treatment. It is obligatory, therefore, to:

a) Prevent original treatment patients from becoming retreatment patients. It is almost axiomatic that breaks in therapy continuity contribute measurably and primarily to failure in achieving treatment objectives.

b) Keep retreatment patients under therapy. Although palpably less than ideal, the results of therapy in retreatment patients are reasonably acceptable.

c) Use maximally effective initial chemotherapy to obtain early sputum conversion and avoid antimicrobial resistance.

d) Employ surgical measures early in the presence of persistent cavitation.

e) Give cardinal place to the various attentions needed to reduce the rate of absconding. Admittedly, with the recalcitrant fraction of our sanatorium populations increasing, enlistment of patient interest and cooperation is discouragingly difficult. Successful effort along these lines is mandatory, however. On the national level increasing attention is being given to the combined problem of tuberculosis and alcoholism. Prominent, too, are the increased efforts toward better measures of rehabilitation. Such advances, however, must find application at the individual level in an effort to capture the interest of the disininterested patient. Education, understanding, tolerance, firmness, all must play a part. Only to the extent that all patients are brought and kept under antimicrobial therapy for adequate periods can they be either cured or maintained in an acceptable degree of negativity.

SUMMARY

Significant differences in background and in treatment response were noted in 643 original and 495 retreatment patients admitted with pulmonary tuberculosis to Wm. H. Maybury Sanatorium during the calendar years 1955 and 1956. The typical retreatment patient was unskilled, alcoholic, with far-advanced fibrocavitary disease of two years' duration, an abscondee with one or two periods of previous therapy; his original treatment counterpart had slightly less extensive, more exudative disease and more stable personality traits. In roentgenologic clearing, cavity closure, sputum conversion or surgical transfer, the retreatment patient lagged far behind; he experienced more x-ray worsening, bacillary resistance and late death from tuberculosis. Notwithstanding, the degree of success in treating the repeat case is reasonably acceptable. To obtain maximal success, it is obligatory to use chemotherapy of highest initial impact, employ surgical measures early, and give cardinal place to the various attentions needed to reduce the rate of absconding.

RESUMEN

Se encontraron diferencias significativas en los antecedentes y en los resultados del tratamiento en 643 enfermos originalmente atendidos y en 495 tratados por segunda vez, admitidos con tuberculosis pulmonar en el Sanatorio Maybury durante los años de 1955 y 1956.

El enfermo de readmisión era el tipo trabajador no especializado, alcohólico, con tuberculosis muy avanzada fibro-cavitaria de dos años de duración, de los que rhenulan la continuación del tratamiento en dos o tres periodos anteriores; los otros, tratados por primera vez, con lesiones ligeramente menos extensas, con mayor factor exudativo, y más rasgos de personalidad estables. En lo que se refiere a limpieza radiológica, cierre de cavidades, conversión de espumado, y logro de alta o paso a cirugía, el enfermo de tratamiento renovado, se quedó mucho atrás del de tratamiento primitivo; se observó en él más frecuente empeoramiento radiológico, más resistencia bacteriana, y muerte tardía por tuberculosis.

Sin embargo, el grado de éxito en el tratamiento del enfermo de repetición es aceptable razonablemente. Para obtener el máximo de resultados es obligatorio usar la quimioterapia de acción más intensa, emplear los procedimientos quirúrgicos pronto y dar importancia capital a los que sea necesario para evitar que se rebuya el tratamiento.
RESUME

Les auteurs notèrent des différences marquées aussi bien dans leur état que dans la réponse au traitement chez 643 malades traités pour la première fois et chez 495 autres traités de façon itérative, tous ayant été admis pour tuberculose pulmonaire au Sanatorium W. H. Maybury, pendant les années 1955 et 1956. Le type de malade traité pour la seconde fois était inadapté, alcoolique, atteint de tuberculose fibro-cavitaire très avancée, datant déjà de deux ans, et ayant interrompu une ou deux périodes de traitement antérieur le malade se présentant pour la première fois avait une affection légèrement moins extensive, plus exsudative, et une personnalité plus stable. Les résultats du malade qui avait rechuté étaient nettement moins bons au point de vue des progrès radiologiques, de la fermeture cavitaire, de la négativation de l'expectoration et du moment où l'on pouvait envisager la sortie de l'hôpital ou le transfert dans un centre chirurgical; on pouvait constater une aggravation radiologique plus fréquente, une résistance bacillaire et finalement la mort pour tuberculose. Néanmoins, la proportion de succès dans le traitement de ces cas à rechutes n'est pas trop mauvaise. Pour en obtenir le maximum, il est nécessaire d'utiliser la chimiothérapie à des concentrations plus élevées que lors des traitements précédents, d'avoir recours à des mesures chirurgicales précoces, et de donner une place capitale aux diverses surveillances nécessaires pour réduire le taux des abandons spontanés de la thérapeutique.

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