THE EXPERIENCE OF SURGICAL TREATMENT OF PATIENTS WITH PULMONARY EXTENSIVELY RESISTANT TUBERCULOSIS

Analysis of outcomes in 59 patients treated from extensively resistant tuberculosis (XDR TB) with anti-TB drugs of the reserve line was conducted. Implementation of surgical methods of treatment allowed to obtain the sputum smear conversion in 65.5% of cases; while conventional therapy, without surgical intervention, provided conversion only in 36.7% (P<0.05). Priority in surgery at the total drug resistance should be given to the collapse surgery. Surgical treatment of XDR TB should be implemented by strict indications. Choice of the volume of surgical operation and approach should be done taking into account the clinical and laboratory data, expansion of the lung tissue injury and degree of M. tuberculosis drug resistance.

Keywords: XDR TB, surgical treatment.

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Introduction

For the last time tendency for growing of drug resistant tuberculosis including extensively drug resistant TB is marked all over the world. In Kazakhstan nearly 48% of all cases among newly detected TB patients constitute the specific processes with destruction and positive sputum smears (Rakishev, 2002). In this situation role of surgical treatment becomes to be more and more significant in eliminating the source of TB infection, i.e. cavity (Iseman, 2000).

This investigation considers impact of the surgical methods of treatment to prevent M. tuberculosis emission in patients with extensively resistant tuberculosis (XDR TB) against the background of anti-TB chemotherapy.

Material and methods

This investigation was conducted at the Department of surgical treatment of pulmonary tuberculosis with multiple drug resistance of the National Center for TB Problems (Kazakhstan).

It was conducted the prospective and comparative analysis of treatment of 29 patients (the main group) with XDR TB; these patients received surgical interventions against the background of chemotherapy with anti-TB drugs of the reserve line.

The control group included 30 patients with XDR TB treated with anti-TB drugs of the reserve line only, without surgical intervention.

The main and control groups enrolled young men up to 40 years percentage of which constituted 81.2% and 84.6% correspondingly. Women in the main group were 16 (55.25%), men - 13 (44.8%); while in the control one number of women was 9 (30%), of men 21 (70%).

The groups of comparison were presented by patients with relapses and failure of treatment of pulmonary TB process, in the main group they occurred in 37.9% and 62.1% while in the control group they constituted 30% and 70% respectively.

Both groups included the patients with fibro-cavernous pulmonary TB with confirmed drug resistance to anti-TB drugs of the first and reserve lines.
In the main group the expansion of tuberculosis process in the lungs was as followed: lesion of one lobe was marked in 14 (48.3%) of patients, lesion of whole lung occurred in 13 (44.8%), and lesion in the limits of one segment - in 2 (6.9%). In the control group the TB injury expansion in the limits of a lobe was observed in 18 (60%), and lesion of whole lung occurred in 12 (40%).

Investigation of the sputum smears using microscopy method for M. tuberculosis (MBT) identification in patients of the main group before treatment showed the positive results in 87.7% of cases. Implementing the culture inoculation on Lowenstein-Jensen medium gave the positive results in 100%. In the control group of patients M. tuberculosis were identified in 100% of cases by both above mentioned methods. Spectre of drug resistance in both groups was presented by complicated combination of resistance to anti-TB drugs of the first and reserve lines (Figures 1 and 2).

**Figure 1. The spectre of drug resistance of M. tuberculosis in patients of the main group**

**Figure 2. The spectre of drug resistance of M. tuberculosis in patients of the main group**

In the main and control groups acquired drug resistance to anti-TB drugs of the first and reserve lines was confirmed in all 59 (100%) patients, nature of the resistance
corresponded to the “XDR TB” definition since M. tuberculosis isolated from sputa had the resistance to the isoniazid, rifampicin, fluoroquinolons and aminoglicozides.

In the groups of comparison for all patients it was administrated the specific treatment with anti-TB drugs of the reserve line in the different combinations depending on determined spectre of drug resistance. It was obligatory to include moxifloxacín, amoxicillin/clavulon acid, clarithromycin in the treatment schema. Chemotherapy was directly observed and it was planned for 24 months including the intensive (in-patient) and continuation (out-patient) phases.

Resection and collapse surgical methods were principal surgical interventions. Effectiveness of treatment in both groups was evaluated by results of sputum smear conversion and bacteriological method of culturing on Lowenstein-Jensen medium.

Results

Conversion in patients of the control group during first and second months of the treatment was marked in 16.7% and 13.3% of cases respectively. During third and fourth months sputum smear conversion occurred in 6.7% and during fifth and ninth months of treatment it did in 3.3% respectively.

Thus, in the control group maximum of sputum smear conversion occurred in 30% during first two months. In general sputum smear conversion was marked in 50% of cases during 12 months of treatment.

The cultural sputum investigation showed the M. tuberculosis emission stopping during first month in 6.7% of cases, second month - in 20%, fourth month - in 3.3%, fifth month - in 3.3%, and twelfth month in 3.3%.

In general percentage of M. tuberculosis emission stopping among persons of the control group confirmed by microscopy and culture methods constituted 50% and 36.7% respectively during 12 months of chemotherapy.

Lower percentage of conversion confirmed by cultural method (36.7%) compared with analogous results obtained by microscopy (50.0%) in the same patients can be explained by decrease of M. tuberculosis capacity to grow in patients with drug resistance.

In the control group of patients after chemotherapy completed, failure of treatment was stated in 63.3% of cases 26.6% out of them died.

Along with anti-TB therapy two types of surgical intervention - resection (62.1%) and collapse surgery (37.9%) - were implemented. The resections were presented as the atypical segmentectomy, lobectomy, pneumonectomy and combined resection. The collapse surgery was presented by different modifications of thoracomioplastics. The surgical methods of treatment were used for all 29 patients of the main group in the intensive phase. The nature of the operative interventions is presented in the Table 1.

<table>
<thead>
<tr>
<th>Type of operation</th>
<th>Main group (n=29)</th>
<th>Postoperative complications</th>
<th>Progressing</th>
<th>Pleural empyema complicated with bronchus stump fistula</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Resection interventions</td>
<td>18</td>
<td>62.1</td>
<td>3</td>
<td>10.3%</td>
<td>5</td>
</tr>
<tr>
<td>Collapse surgical interventions</td>
<td>11</td>
<td>37.9</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>100</td>
<td>3</td>
<td>10.3%</td>
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Analysis showed that in the postoperative period in this group of patients complication occurred in 17.2% in the form of pleural empyema with bronchial fistula of the main bronchus as a result of resection intervention; TB process progressed in lungs was marked.
in 10.3% of cases. Postoperative complications were absent in implementation of collapsosurgical treatment approaches compared with resection interventions in the main group (OR=2.7; CI 1.507-4.890; p<0.05).

Sputum smear investigation for MBT identification using both bacteriological methods showed that in the main group conversion occurred in 65.5% (19 patients) of cases in the different stage of postoperative period. Sufficiently high percent of conversion was confirmed by bacteriological culture method three months later, in 24.1% of patients after resection intervention and in 31% after collapsosurgical intervention (Table 2).

<table>
<thead>
<tr>
<th>Type of operation</th>
<th>Methods of sputum smear investigation for MBT</th>
<th>Terms of sputum smear conversion after operation</th>
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<tr>
<td></td>
<td></td>
<td>1st month</td>
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<tr>
<td></td>
<td></td>
<td>n</td>
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<tr>
<td>Resection</td>
<td>Microscopy</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Culturing</td>
<td>4</td>
</tr>
<tr>
<td>Collapse surgery</td>
<td>Microscopy</td>
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<td></td>
<td>Culturing</td>
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</table>

In 10 (34.4%) cases from main group sputum smears remained positive after resection interventions; so, the fact of treatment failure was registered. During further treatment and observation 6 (20.7%) of them died from TB process progressed. Criterion $\chi^2$ showed that in the main group compared with the control group M. tuberculosis the emission stopping was observed reliably more frequently at culturing method implementation ($\chi^2=4.911$; df=1; p<0.05); OR =7.857; CI 1.312-47.044; p<0.05).

Thus, implementation of the surgical method of treatment against the background of chemotherapy with anti-TB drugs of the reserve line for patients with XDR TB compared with analogous pathology in persons treated with anti-TB drugs only allowed to reach the reliably higher percentage of conversion (65.5% versus 36.7%), lower percentage of treatment failure (34.4% versus 63.3%) and outcomes “died” (20.7% versus 26.6%). In general all these positive results were obtained in patients with XDR TB at addition of collapsosurgical intervention. At this the faster stabilization of the specific process and suppression of infection source took place.

References
