Features of endobronchial pathology among patients with chemoresistant tuberculosis of lungs depending on a case of the previous disease

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Key words: bronchoscopic, tracheobronchial tree mucosa, chemoresistant tuberculosis.

Objectives – to study character and features of endobronchial pathology among patients with chemoresistant tuberculosis (CRTB) of lungs depending on a case of the previous disease.

Materials and methods. Studying of endobronchial pathology was carried out in 79 patients with CRTB of lungs with lesion of mucosa of bronchi. The patients were divided into 2 groups depending on a case of the previous disease of tuberculosis: the 1st group included 35 patients with new cases (tuberculosis) of CRTB of lungs (middle age — 39.1 ± 2.2 years), the second — 44 patients with repeated cases of CRTB of lungs (middle age — 39.5 ± 1.7 years diagnosed for the first time). In both groups males prevailed: 23 (65.7 %) and 31 (70.4 %), respectively. Diagnostic fibre-optic bronchoscopy of a tracheobronchial tree was carried out on clinical base of the department of phthisiology and pulmonology of ZSMU at Municipal institution “Zaporizhzhia Regional Antituberculosis Dispensary” by the applicant V. M. Khlystun. The criteria for including of patients into the study were: existence of resistance of mycobacteria of tuberculosis to anti-microbial drugs among patients with new and repeated episodes of tuberculosis, pathology of the mucosa of bronchi confirmed at fiber-optic bronchoscopy. Serious associated diseases (HIV infection/AIDS, diabetes mellitus, etc.) were criteria of exclusion. The condition of mucosa of bronchi was studied under narcotic anaesthesia by fibrotic bronchoscopes of Olympus (Japan). Pathology of a bronchial tree was described according to classification of M. Shesterina, A. Kalyuk (1975). Results of the research are processed by modern methods of the analysis on the personal computer with use of a statistical package Statistica® for Windows 6.0 license program (StatSoft Inc., No. AXXR712 D833214FANS).

Results. All patients with CRTB of lungs with endobronchial pathology, irrespective of the case of the previous disease excreted mycobacteria with prevalence of multirefractory strains of MTB and had infiltrative clinical form and destructive lesion of segmental bronchi of S1-S5. Among patients with new cases of CRTB of lungs tuberculosis of bronchi prevailed and among patients with repeated cases of CRTB of lungs the nonspecific endobronchitis prevailed. Irrespective of the case of the previous disease, tuberculosis of bronchi was diagnosed mainly in combination with non-specific endobronchitis. Infiltrative tuberculosis of bronchial tubes (62.9 %) prevailed among patients with new cases of CRTB of lungs, and among with repeated — the frequency infiltrative and infiltrative fistulous was almost identical (27.5 % and 25 % respectively). The frequency of development of stenosis of the affected bronchial tube was seen in 1.6 times more often than in case of the repeated one (65.7 % against 40.9 % respectively). Non-specific endobronchitis among the patients with CRTB of lungs, irrespective of the case of the previous disease, preferentially one-sided localization also had a purulent character.

Conclusions. The obtained data demonstrated that it is necessary to apply both specific and non-specific methods of correction, pathology of mucosa of a tracheobronchial tree among the patients with CRTB of lungs, irrespectively of the case. At the same time this correction among the bigger part of patients, namely, with existence of the combined course of tuberculosis of bronchi and non-specific bronchitis demands simultaneous use of methods of correction of both pathologies.
Особенности эндобронхиальной патологии у больных химиорезистентным туберкулёзом лёгких в зависимости от случая предыдущего заболевания

Е. Н. Разнатовская, В. Н. Хлыстун

Цель работы — изучить характер и особенности эндобронхиальной патологии у больных химиорезистентным туберкулёзом (ХРТБ) лёгких в зависимости от случая предыдущего заболевания.

Материалы и методы. Изучили эндобронхиальную патологию у 79 больных ХРТБ лёгких с поражением слизистой оболочки бронхов. Больные были разделены на 2 группы в зависимости от случая предыдущего заболевания туберкулёзом: одну группу составили 35 больных с новыми случаями ХРТБ лёгких (средний возраст – 39,1±2,2 года), вторую – 44 больных с повторными случаями ХРТБ лёгких (средний возраст – 39,5±1,7 года). В обеих группах преобладали лица мужского пола: 23 (65,7 %) и 31 (70,4 %) соответственно. Диагностическая фибробронхоскопия трахеобронхиального дерева была выполнена у всех больных с новыми и повторными случаями заболевания туберкулёзом. Патологию бронхиального дерева описывали по классификации М. Шестериной и А. Калюк (1975). Результаты исследования обработаны современными методами анализа на персональном компьютере с использованием статистического пакета лицензионной программы «Statistica® for Windows 6.0» (StatSoft Inc., № AXXR712 D833214FAN5).

Результаты. Все больные ХРТБ лёгких с эндобронхиальной патологией, независимо от случая предыдущего заболевания, были бактериовыделителями с преобладанием мультирезистентных штаммов МБТ, инфильтративной клинической формы и деструктивного поражения сегментарных бронхов S₁+2+6. У больных с новыми случаями ХРТБ лёгких преобладал туберкулёз бронхов, а у лиц с повторными случаями ХРТБ лёгких — неспецифический эндодонкт. Независимо от случая предыдущего заболевания, туберкулёз бронхов диагностировался преимущественно в сочетании с неспецифическим эндодонктом. У больных с новыми случаями ХРТБ лёгких преобладал неспецифический эндодонкт бронхов (62,9 %), а с повторными — частота инфильтративно-не специфического и инфильтративно-свищевого была почти одинаковой (27,5 % и 25 % соответственно). Частота развития стеноза поражённого бронха при новых случаях в 1,6 раза чаще, чем при повторных (65,7 % против 40,9 % соответственно). Неспецифический эндодонкт у больных ХРТБ лёгких, независимо от случая предыдущего заболевания, — преимущественно односторонней локализации и носит гнойный характер. При наличии деструктивного процесса в сегментарных бронхах (S₁, S₁+S₂, S₁+2+S₆) туберкулёз этих бронхов сопровождался в 65,7 % из 88,6 % при новых случаях ХРТБ лёгких и в 47,7 % из 90,9 % — при повторных.

Выводы. Полученные данные свидетельствуют о том, что у больных ХРТБ лёгких, независимо от случая заболевания, необходимо применять методы коррекции как специфической, так и неспецифической патологии слизистой оболочки трахеобронхиального дерева. При этом коррекция у больных с новыми случаями заболевания требует индивидуального подхода, учитывающего особенности эндобронхиальной патологии при ХРТБ лёгких.

Ключевые слова: бронхоскопия, трахеобронхиальное дерево, неспецифическая оболочка, химиорезистентный туберкулёз.

Table 1. Distribution of patients with CRTB of lungs with endobronchial pathology in the presence of bacterioexcretion and destructive process, n (%)  

<table>
<thead>
<tr>
<th>Indicators</th>
<th>New cases, n=35</th>
<th>Repeated cases, n=44</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>abs.</td>
<td>%</td>
</tr>
<tr>
<td>Bacterioexcretion</td>
<td>35</td>
<td>100</td>
</tr>
<tr>
<td>Destructive process</td>
<td>31</td>
<td>88.6</td>
</tr>
<tr>
<td>– in segmentary bronchial tubes (S_{1+2})</td>
<td>21</td>
<td>60.0</td>
</tr>
<tr>
<td>– in a segmentary bronchial tube (S_6)</td>
<td>6</td>
<td>17.2</td>
</tr>
<tr>
<td>– in segmentary bronchial tubes (S_1) and (S_3)</td>
<td>4</td>
<td>11.4</td>
</tr>
</tbody>
</table>

*: reliable difference of the existence of destruction in segmentary bronchial tubes within one group \(p<0.05\).

Materials and methods

Studying of endobronchial pathology was carried out among 79 patients with CRTB of lungs with lesion of mucosa of bronchi. The patients were divided into 2 groups depending on a case of the previous disease of tuberculosis: the 1st group consisted of 35 patients with newly diagnosed cases (tuberculosis) of CRTB of lungs (middle age – 39.1 ± 2.2 years), the second – of 44 patients with repeated cases of CRTB of lungs (middle age – 39.5 ± 1.7 years diagnosed for the first time). In both groups males prevailed: 23 (65.7 %) and 31 (70.4 %) respectively. The repeated cases are recurrence of tuberculosis (RTV), treatment after a break (TAB), treatment after failure of chemotherapy (FTTB) and others (OTB). Among the patients with repeated cases of CRTB of lungs with RTV there were 25 people (56.8 %), OTB – 3 (6.8 %), TAB – 4 (9.1 %), FTTB – 12 (27.3 %). The groups were compared by age, gender and the main anthropometric indicators.

Diagnostic of FBS of a tracheobronchial tree among patients with CRTB of lungs was carried out on clinical base of the department of phthisiologic and pulmonology of ZSMU at Municipal institution «Zaporizhzhia Regional Antituberculosis Dispensary» by the applicant V. M. Khlystun.

The criteria of involving the patients into the research were: existence of resistance of micobacteria of tuberculosis (MBT) to anti-microbacterial drugs among patients with new and repeated cases of tuberculosis, existence of pathology of mucosa of bronchi confirmed at FBS. Serious associated diseases (HIV infection/AIDS, diabetes mellitus, etc.) were exception criteria.

The condition of mucosa of bronchi was studied under narcotic anaesthesia by fibrotic bronchoscopes made by Olympus (Japan). The pathology of a bronchial tree was described according to classification of M. Shesterina, A. Kalyuk (1975): at a specific lesion of bronchi the infiltrative form prevailed: among 30 (85.7 %) patients with new cases and among 28 (63.6 %) – with repeated one. At the same time it was diagnosed among the patients with new cases 1.3 times more often \(p<0.05\). The focal form was established only by 1 patient (2.9 %) with a new case, and caseous pneumonia – only by 1 (2.3 %) with a repeated case. Between disseminated and fibrocavernous (FCT) forms a reliable difference between the groups was not revealed, but among patients with repeated cases they were registered more often: disseminated by 2.5 times \((9 (20.5 \%)\) against \((3 (8.5 \%)\)) and FCT by 4.6 times \((6 (13.6 \%)\) against \((1 (2.9 \%)\)).

Diagnostic FBS allowed to study visually the changes of mucosa of bronchi of a tracheobronchial tree (Table 2). It has been found that tuberculosis of bronchi (TB) prevailed among patients with new cases \((77.1 \%)\) against \((52.3 \%)\) with repeated cases \(p<0.05\), and the persons with repeated cases had non-specific endobronchitis \((47.8 \%)\) against \((22.8 \%)\) with new cases \(p<0.05\). Studying of clinical forms among patients with CRTB of lungs with endobronchial pathology showed that the patients in both groups the infiltrative form prevailed: among 30 (85.7 %) with new cases and among 28 (63.6 %) – with repeated one. At the same time it was diagnosed among the patients with new cases 1.3 times more often \(p<0.05\). The focal form was established only by 1 (2.9 %) with a new case, and caseous pneumonia – only by 1 (2.3 %) with a repeated case. Between disseminated and fibrocavernous (FCT) forms a reliable difference between the groups was not revealed, but among patients with repeated cases they were registered more often: disseminated by 2.5 times \((9 (20.5 \%)\) against \((3 (8.5 \%)\)) and FCT by 4.6 times \((6 (13.6 \%)\) against \((1 (2.9 \%)\)).

Diagnostic FBS allowed to study visually the changes of mucosa of bronchi of a tracheobronchial tree (Table 2). It has been found that tuberculosis of bronchi (TB) prevailed among patients with new cases \((77.1 \%)\) against \((52.3 \%)\) with repeated cases \(p<0.05\), and the persons with repeated cases had non-specific endobronchitis \((47.8 \%)\) against \((22.8 \%)\) with new cases \(p<0.05\). Studying of features of the progress of TB among patients with CRTB of lungs depending on a case was carried out. It has been found that in both TB groups it was diagnosed mainly in combination with non-specific endobronchitis. So, among patients with new cases a combined progress was found among 24 \((68.6 \%)\) against 3 \((8.6 \%)\) with TB \(p<0.05\), and among patients with repeated cases – at 17 \((38.6 \%)\) against 6 \((13.6 \%)\) with TB \(p<0.05\).
As the Table 2 testifies, by nature of specific damage of bronchial tubes the infiltrative damages of a mucous membrane prevailed among patients with new cases, as in relation to repeated cases (62.9 % against 27.3 %; р < 0.05) and rather infiltrative fistulous forms of this group (62.9 % against 14.3 %; р < 0.05). The patients with repeated cases have progress of the infiltrative form of TB and infiltrative fistulous was almost identical (27.3 % and 25 % respectively). At the same time among patients with new cases a specific process in bronchial tubes was followed by stenosis more often by 1.4 times, than by repeated cases (65.7 % against 40.9 %; р < 0.05).

Non-specific inflammatory damage of bronchial tubes was the following. With new cases of CRTB of lungs non-specific endobronchitis was diagnosed among patients in 91.4 %, irrespective of the fact, whether it was it independent (22.8 %), or in combination with TB (68.6 %), and in all cases it had purulent character. Among patients with repeated cases of CRTB of lungs also, irrespective of the above specified, purulent endobronchitis (77.3 %) prevailed, which at the independent course of endobronchitis occurred by 18 people (40.9 %) and by a joint progress with TB occurred among 16 (36.4 %). Besides, among patients with repeated cases catarhal endobronchitis was revealed by 1 (2.3 %), subatrophic – by 2 (4.5 %) and fibrinous – by 1 (2.3 %). By localization non-specific endobronchitis in both groups was mainly unilateral: among 82.9 % with new cases and among 72.7 % – with repeated one. By prevalence of endobronchitis in both groups, irrespective of a case, a reliable difference between diffusion and limited process wasn’t found: 37.1 % and 54.3 %, respectively – among patients with new cases and 52.3 % and 34.1 %, respectively – with repeated cases.

By comparison of results of the research of simultaneous diagnostics of destructive process in segmental bronchi (S₁+₂, S₁+₂+₆) and tuberculosis of bronchi it has been found that among patients with new cases of CRTB of lungs this progress with a specific lesion of the corresponding bronchus occurred among 23 people (65.7 %) of 31 (88.6 %) and by repeated – among 21 (47.7 %) of 40 (90.9 %).

Among 15 patients (42.8 %) with new cases of CRTB of lungs in the presence of destructive process in S₁+₂ in 9 (25.7 %) TB was diagnosed in S₁+₂ and among 6 (17.1 %) lesion of a top of a partial bronchus. Among all 6 (17.2 %) patients with destructors in S₁+₂ TB in S₁ was found. In the presence of destruction in S₁+₂+₆, TB was diagnosed among 2 (5.7 %) of 4 people.

At repeated cases of CRTB of lungs the following picture was defined. In the presence of destructive process in S₁+₂ at 12 (27.3 %) TB was diagnosed in S₁+₂ and among 6 (13.6 %) lesion of a top of a partial bronchus. In the presence of destruction in S₁+₂+₆ TB was found among 3 (6.8 %) of 11 patients.

Conclusions
1. All patients with CRTB of lungs with endobronchial pathology, irrespectively of a case of the previous disease, were the persons discharging bacteria with prevalence of multirefractory strains of MBT, infiltrative clinical form and destructive lesion of segmental bronchi of S₁+₂+₆.
2. Among patients with newly diagnosed cases of CRTB of lungs the tuberculosis of bronchi prevailed and among patients with repeated cases of CRTB of lungs the non-specific endobronchitis prevailed. Irrespectively of a case of the previous disease, tuberculosis of bronchi was diagnosed mainly in combination with non-specific endobronchitis.
3. Among patients with new cases of CRTB of lungs the infiltrative tuberculosis of bronchial tubes (62.9 %) prevailed, and with the repeated one – frequency infiltrative and infiltrative fistulous was almost identical (27.5 % and 25 % respectively). The frequency of development of stenosis of the affected bronchial tube in new cases occurred by 1.6 times more often than in case of the repeated one (65.7 % against 40.9 % respectively).
4. Non-specific endobronchitis among patients with CRTB of lungs, irrespectively of a case of the previous disease, is preferentially of one-sided localization and has purulent character.
5. In the presence of destructive process in segmental bronchi (S₁+₂, S₁+₂+₆) it was followed by tuberculosis of these bronchi in 65.7 % of 88.6 % of new cases of CRTB of lungs and in 47.7 % of 90.9 % – of the repeated ones.
6. The obtained data demonstrate that, irrespectively of a case, among patients with CRTB of lungs, it is necessary to apply correction methods, both of specific and non-specific pathology of mucosa of a tracheobronchial tree. At the same time this correction by the most part of patients, namely, with existence of the combined course of tuberculosis of bronchi and non-specific bronchitis, demands simultaneous use of methods of correction of both pathologies.

Prospects of further scientific research. Development and justification of additional methods of endobronchial therapy of pathology of mucosa of bronchi among patients with CRTB of lungs will entirely promote therapeutic actions among these patients with CRTB and increase the efficiency of treatment.

Table 2. Distribution of patients with CRTB of lungs according to the character of endobronchial pathologies, n (%)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>New cases, n=35</th>
<th>Repeated cases, n=44</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>abs.</td>
<td>%</td>
<td>abs.</td>
</tr>
<tr>
<td>TB</td>
<td>27</td>
<td>77.1</td>
<td>23</td>
</tr>
<tr>
<td>TB infiltrative</td>
<td>22</td>
<td>62.9</td>
<td>12</td>
</tr>
<tr>
<td>TB infiltrative fistu</td>
<td>5</td>
<td>14.3</td>
<td>11</td>
</tr>
<tr>
<td>With stenosis</td>
<td>23</td>
<td>65.7</td>
<td>18</td>
</tr>
<tr>
<td>Endobronchitis</td>
<td>8</td>
<td>22.8</td>
<td>21</td>
</tr>
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</table>

References
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Conflicts of Interest: authors have no conflict of interest to declare.