Clinical analysis on postoperative complications of stage IIIa non-small-cell lung cancer treated by Kanglaite Injection combined with neoadjuvant chemotherapy

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[Abstract] Objective: To analyze postoperative complications of stage IIIa non-small-cell lung cancer (NSCLC) treated by Kanglaite Injection (KLT) combined with preoperative neoadjuvant chemotherapy.

Methods: 47 patients with stage IIIa NSCLC received KLT combined with neoadjuvant chemotherapy from Jan. 1999 to Dec. 2003. Simultaneously 45 cases comparatively received single neoadjuvant chemotherapy. All patients had lobectomy or total pneumonectomy and clearance of diaphragmatic lymph node. Observing indicators for postoperative complications were total drainage volume, postoperative pulmonary infection, cardiac arrhythmia requiring medication, atelectasis requiring sputum suction by fiber-bronchoscope, broncho-pleural fistula, pulmonary edema and pulmonary embolism. Postoperative mortality was compared. Results: Postoperative total drainage volume, incidences of pulmonary infection and of arrhythmia requiring medication of patients treated with KLT combined with preoperative neoadjuvant chemotherapy were apparently lower than those of patients treated with single neoadjuvant chemotherapy (P<0.05). 3 patients died in the group of single neoadjuvant chemotherapy. Conclusion: KLT combined with neoadjuvant chemotherapy to treat stage IIIa non-small-cell lung cancer could reduce postoperative complications and mortality.

[Key words] NSCLC; Neoadjuvant chemotherapy; Postoperative complication; Semen coicis; Therapeutic application

Bronchogenic pulmonary carcinoma, a common malignant tumor in China, is on top of male malignant tumors in cities with increasing incidence and among which NSCLC accounts for about 85% of total cases. Most patients already enter mid or late stages when diagnosed due to the fact that there is currently no breakthrough in early stage diagnosis and treatment of lung cancer although 5-year survival of stage IIIa after resection was only 23-25% according to statistics from Mountain [1]. Therefore it has been a hot subject in the world to further improve post operational survival rate via preoperative neoadjuvant chemotherapy (NACT) whereas clinical observation on effect of NACT on postoperative complications of stage IIIa NSCLC is found to be far less. Kanglaite Injection (KLT), a formulation with extract from TCM semen coicis could combined with chemotherapy to minimize toxic and side reactions [2, 3]. We applied KLT + NACT regimen for 47 cases with stage IIIa NSCLC from Jan. 1999 to Dec. 2003 and compared with 45 cases receiving single NACT regimen at the same period to determine effect of KLT combined with NACT on postoperative complications. The report is as follows.

1. Materials and methods
1.1 Case selection
92 cases histologically and pathologically confirmed as operable stage IIIa (UICC 1997 criteria for lung cancer stages) between Jan. 1999 and Dec. 2003 were enrolled with age between 30-68 years, estimated survival time longer than 6 months and KPS ≥ 70 scores. Experimental group (EG) and
control group (CG) were randomly divided with 47 cases in EG including squamous 21 cases and adeno-carcinoma 26 cases (male 32, female 15 with median age of 55 years) and 45 cases in CG including squamous 20 and adeno-carcinoma 25 (male 30, female 15 with median age of 53 years).

1.2 Treatment methods
Preoperative NACT NP regimen for EG: NVB 25mg/m^2, iv drip, d1, d8; DDP 100mg/m^2, iv drip, d1 with hydration; KLT 200ml/day, iv drip, d1-14, 21 days as a cycle and 2 cycles were applied before surgical operation. Regimen for CG: Same as that for EG without application of KLT.

During 2-3 weeks after the second cycle of chemotherapy all patients received chest CT, head CT, whole-body bone scanning, EKG and ultrasonic B. Patients with progressive disease got radiation therapy or other chemotherapy instead of operation. All cases received surgical operation (lobectomy or total pneumonectomy and clearance of diaphragmatic lymph node) 3-4 weeks after the second cycle of chemotherapy.

1.3 Observing indicator
Observing indicators for each case were postoperative total drainage volume, postoperative pulmonary infection, cardiac arrhythmia requiring medication, atelectasis requiring sputum suction by fiber-bronchoscope, broncho-pleural fistula, pulmonary edema and embolism. Postoperative 30-day mortality relating to surgical operation was observed.

1.4 Statistic processing
All data were processed with SPSS 9.0 and tested by T and X^2.

2. Results
After 2 cycles of NACT there was 1 case in EG and 3 cases in CG quitted the study for radiation and other chemotherapy due to progressive disease and remaining 88 cases received resection (46 cases in EG and 42 in CG). See Table 1 for comparison on postoperative complications between the two groups.

Table 1  Comparison on postoperative complications between the two groups

<table>
<thead>
<tr>
<th>Observing indicator</th>
<th>Experimental Group</th>
<th>Control Group</th>
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<tbody>
<tr>
<td>Postoperative total drainage volume (ml/case)</td>
<td>Average 450</td>
<td>Average 820</td>
</tr>
<tr>
<td>Pulmonary infection (case, %)</td>
<td>2 (4.3%)</td>
<td>7 (16.7%)</td>
</tr>
<tr>
<td>Arrhythmia requiring medication (case, %)</td>
<td>3 (6.5%)</td>
<td>12 (28.5%)</td>
</tr>
<tr>
<td>Atelectasis requiring sputum suction (case, %)</td>
<td>3 (6.5%)</td>
<td>2 (4.2%)</td>
</tr>
<tr>
<td>Broncho-pleural fistula (case, %)</td>
<td>0</td>
<td>1 (2.4%)</td>
</tr>
<tr>
<td>Pulmonary edema (case, %)</td>
<td>1 (2.1%)</td>
<td>0</td>
</tr>
<tr>
<td>Pulmonary embolism (case, %)</td>
<td>0</td>
<td>1 (2.4%)</td>
</tr>
</tbody>
</table>

After statistic analysis the results showed comparison on total drainage volume, incidence in pulmonary infection and in arrhythmia requiring medication had significant differences (P<0.05) and
incidences of other complications had no notable difference (P>0.05).

Postoperative mortality: 0 case in EG and 3 cases in CG caused by postoperative pulmonary infection leading to respiratory failure. Mortality in CG was apparently higher than that in EG (P<0.05).

3. Discussion
For operable stage IIIa NSCLC, application of NACT could raise resection rate by shrinking tumor size, reduce body functional damage, eliminate minor metastatic lesions and decrease diffusion of tumor cells during operation by reducing activity of tumor cells \(^4\). However report about impact of NACT on postoperative complications and mortality was less found. This study initially indicated that postoperative total drainage volume, incidence of pulmonary infection and arrhythmia requiring medication in regimen of KLT plus NP were less than those in single NP regimen with significant statistic differences. This was due to the fact that KLT could improve general condition of patient and protect platelet \(^5\). Su Yanjun, et al \(^6\) held that application of NACT could make fibrosis and proliferation to endangium and this would add extra difficulty in separating vessels anatomically, increase fragility of vessels and postoperative drainage volume as well. Due to platelet protection, KLT did not increase postoperative drainage volume as a result of thrombocytopenia after NACT. In addition, most lung cancer patients are aged with general asthenia and easily get decreased body resistance, pulmonary infection and arrhythmia because of sputum obstruction. KLT could provide body with energy, reduce toxic and side reaction of chemotherapy and improve life quality \(^7\). Application of KLT could make immune capacity and body reservation still at better levels after operation, reduce incidence of pulmonary infection and cardiac arrhythmia and minimize postoperative mortality.

We hold that attention should be paid to postoperative fragility of blood vessels for those patients receiving preoperative NACT, active resistance of infection and prevention of arrhythmia. KLT, combined with NACT, can reduce incidence of postoperative oozing of blood, pulmonary infection and arrhythmia that requires medication. Therefore KLT combined with NACT can reduce incidence of postoperative complications for stage IIIa NSCLC and reduce postoperative mortality.

References

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