

RESEARCH ARTICLE

Clinical Study on Mannan Peptide Combined with TP Regimen in Treating Patients with Non-small Cell Lung Cancer

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Abstract

Purpose: To investigate short-term response rate, quality of life and toxicities of mannan peptide combined with TP regimen in treating patients with non-small cell lung cancer (NSCLC). **Patients and Methods:** Forty one patients with NSCLC were divided into an experimental group treated with TP regimen combined with mannan peptide (21 patients) and a control group treated with TP alone (20 patients). **Results:** Response rates were 61.9% (13/21) for the experimental and 60% (12/20) for the control group ($p>0.05$). Regarding toxicity, white blood cell decreased more frequently in the control group (65%, 13/20) than in the experimental group (33.3%, 7/21) ($p<0.05$); nausea and vomiting also occurred more frequently in the control group (55%, 11/20 vs 23.8%, 5/21) ($p<0.05$). In terms of quality of life, this index was improved by 57.1% (12/21) and 25% (5/20) in experimental and control groups, respectively ($p<0.05$). **Conclusions:** Response rate of TP after combined with mannan peptide is mildly increased, while this combination alleviates bone marrow suppression as well as nausea and vomiting of TP, and improves quality of life when treating patients with NSCLC. However, this conclusion should be confirmed by randomized clinical trails.

Keywords: Paclitaxel - cisplatin - mannan peptide - non-small cell lung cancer - toxicity

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Introduction

It is estimated that 75% of all lung cancers, a leading cause of cancer-related death worldwide, are of non-small cell lung cancer (NSCLC) type (Qin et al., 2013; Wang et al., 2013). Most patients in China present with locally advanced stage III or IV disease. Although current practice for chemotherapy for this cohort of patients includes several newer generation agents such as vinorelbine, gemcitabine, paclitaxel or docetaxel with a platinum agent, no combination has yet emerged as a gold standard (Non-Small Cell Lung Cancer Collaborative Group, 1995; Schiller et al., 2002). Thus, cytotoxic chemotherapy, especially platinum-based doublet chemotherapy continues to be important treatment for advanced NSCLC (Lustberg et al., 2007; Obasaju et al., 2009). However, according to previous report, when oriental patients with advanced NSCLC were treated with platinum-based chemotherapy, the response rate is proximately 19%, and many of these patients would experience disease progression (Schiller et al, 2002; Yao et al, 2009; Li et al, 2011). It is hypothesized that failure of chemotherapeutic treatment could relate to , lower immunological function, multi-drug resistance (MDR) and severe toxicities that discontinue chemotherapy (Gottesman et al, 2002; Illmer et al, 2002). Mannan peptide, is a new immunological

enhancer firstly made and in China, and is hypothesized to be associated with none inferior efficacy and low toxicities when combined with chemotherapy. On this background, we retrospectively recruited patients with NSCLC who were treated with chemotherapy alone or combined with mannan peptide, and analyzed the treatment effects and toxicities of Mannan peptide.

Materials and Methods

General information of patients

Forty one patients (25 male, 16 female) pathologically or cytologically diagnosed with lung cancer were retrospectively recruited into this study, including 22 patients with squamous and 19 with adenocarcinoma; average age was 58 years; KPS score > 70 and expected survival time > 6 months. All patients were divided into experimental (21 patients) or control group (20 patients). All patients had imaging examination including CT or MRI before and after treatment.

Treatment

Experimental group was treated with TP regimen combined with mannan peptide (Sinopharma A-Think Pharmaceutical Co., Ltd –mannan peptide for injection): paclitaxel 85 mg/m², intravenous infused (iv.) on d1 and d

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Table 1. Short-term Responsiveness (CR+PR)

	Number of patients	CR	PR	SD	PD	Response rate (%)
Experimental group	21	4	9	6	2	61.9
Control group	20	3	9	5	3	60

Table 2. Incidence of Toxicities in Two Groups (0 - IV degrees)

	0	I	II	III	IV	Incidence (%)
Nausea and vomiting						
Experimental group	16	3	1	1	0	23.8
Control group	9	4	2	4	1	55
Leukocytopenia						
Experimental group	14	4	1	2	0	33.3
Control group	7	5	3	2	3	65

8; 25 mg/m² cisplatin, iv. d1-3, mannan peptide 10 mg: iv., daily. Control group was treated with TP regimen alone. Chemotherapy was repeated every 3 weeks. Complete blood counts were obtained weekly, and a full serum chemistry profile and ECG were obtained prior to each cycle of chemotherapy.

Evaluation of curative effects

The objective curative effects were evaluated according to RICIST criteria, being divided into complete remission (CR), partial remission (PR), stable (SD) and progression of disease (PD), response rate (RR) was calculated with CR+PR. Toxic reactions were evaluated according to National Cancer Institute-Common Toxicity Criteria (NCI CTC), being divided into Grades 0~4. Quality of life was evaluated according to KPS, increased by 10 score after treatment was considered as improved, decreased by 10 score as declined and unchanged in score as stable.

Statistical method

SPSS statistical package (version 11.5) was used. Data between groups were analyzed by χ^2 test, and $p < 0.05$ was considered statistically significant.

Research experience

We have enough experience in conducting medical researches, including clinical researches, and have published some results elsewhere (Huang et al., 2004; Zhou et al., 2009; Jiang et al., 2010; Yan et al., 2010; Gao et al., 2011; Huang et al., 2011; Li et al., 2011; Li et al., 2011; Li et al., 2011; Xu et al., 2011; Xu et al., 2011; Xu et al., 2011; Yan et al., 2011; Zhang et al., 2011; Gong et al., 2012; Gong et al., 2012; Gu et al., 2012; Li et al., 2012; Yu et al., 2012; Zhan et al., 2012; Zhan et al., 2012; Deng et al., 2013; Huang et al., 2013; Liu et al., 2013; Liu et al., 2013; Lu et al., 2013; Wu et al., 2013; Yin et al., 2013; Yin et al., 2013).

Results

Responsiveness

Response rate (RR) in experimental group was 61.9% (13/21), while the rate of control group was 60% (12/20), with no statistically significant difference ($p > 0.05$), as shown in Table 1.

Table 3. Changes of quality of survival in two groups

	Improved	Stabilized	Decreased	Responsive rate %
Experimental group	5	7	9	57.1(12/21)
Control group	2	3	15	25 (5/20)

Toxicities

Nausea/vomiting and leucocytopenia occurred in most of patients. After symptomatic treatment, these toxicities were alleviated, and no influence on further treatment. However, significantly different toxicities were observed between two groups ($p < 0.05$), as shown in Table 2.

Quality of survival

Quality of life in experimental group was improved by 23.8%, stabilized by 33.3% and decreased by 42.9%; in control group was improved by 10%, stabilized by 15% and decreased by 75%, with statistically significant difference between two groups ($p < 0.05$), as shown in Table 3.

Discussion

At present, chemotherapy is one of the main methods to treat middle-late staged NSCLC, and the treatment goal is to improve quality of life and prolong survival time. Paclitaxel acts in G2 and M-stage cell cycle, induces and promotes polymerization of tubulin, prevents depolymerization, stabilizes microtubules, inhibits the formation of spindle and spindle fiber and thus stops proliferation of tumor cell. Paclitaxel combined with cisplatin is associated with higher response rate. However, adverse reactions will increase when these two chemotherapeutic agents combined, including leucocytopenia, nausea and vomiting so that it was difficult for patients to tolerate. Therefore, how to find a regimen that will strengthen the curative effect and improve immunologic function of patients and reduce adverse reaction is an important research direction at present. Mannan peptide is a new immunologic enhancer. Previous studies suggested that mannan peptide is linked with functions to activate phagocyte, NK cell and subgroup of T, B cells and induce unripe interferon and interleukin and cause DNA rupture of tumor cell and viruses and apoptosis of cell (He et al., 2007). It is suggested that mannan peptide is able to enhance phagocytes of mononuclear phagocyte system, activate macrophages and lymphocyte, improve curative effect of chemotherapy, reduce side effects and improve quality of life (He et al., 2007). In this study, mannan peptide combined with chemotherapy was compared with single chemotherapy regarding response rate, adverse effects as well as change of patient quality of life. Our results showed that response rate of mannan peptide group be slightly higher than that in group with chemotherapy alone; the incidence of bone marrow suppression and gastrointestinal side reactions was significantly decreased, with statistically significant difference. The quality of life in experimental group was significantly improved, with statistically significant difference between two groups.

In conclusion, response rate of TP after combined

with mannan peptide is mildly increased, while this combination alleviates bone marrow suppression as well as nausea and vomiting of TP, and improves quality of life when treating patients with NSCLC. However, this conclusion should be confirmed by randomized clinical trials.

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