Application of auricular acupoints therapy in relieving the gastrointestinal side effects induced by chemotherapy: an integrative review

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ABSTRACT

Background: It is an urgent matter to relieve the side effects induced by chemotherapy. In recent years, auricular acupoints therapy, which is a nursing technique used in traditional Chinese medicine (TCM), has been used on many patients who are undergoing chemotherapy without causing any side effects. Furthermore, it has a good efficacy and is inexpensive.

Aim: The aim of this study was to provide evidence for the need of further research in the treatment and nursing of patients during chemotherapy.

Methods: We conducted an integrated review of the reports in CNKI, WanFang Data, SinoMed, and PubMed databases for journal articles published after 1990. The search terms included auricular acupoints taping and pressing, auricular acupoints therapy, auricular point sticking, ear points, chemotherapy, and side effects and relevant Medical Subject Heading terms. We then analyzed the mechanism, acupoints, and operation method and summarized the application of auricular acupoints therapy in patients suffering from chemotherapy side effects.

Results: This review included 102 articles published between 1990 and 2016, and we brought 63 other articles into the study. Eighteen articles focused on auricular acupoints therapy, combined with other therapy, to relieve patient side effects during chemotherapy.

Conclusions: Auricular acupoints therapy can prevent and relieve the side effects induced by chemotherapy. It deserves further clinical applications.

1. Introduction

Chemotherapy is an important method to treat tumors. Studies show that 70–80% of tumor patients need to undergo chemotherapy to increase its clinical curative effect. Chemotherapy can control the development of tumors, prevent tumor recurrence and metastasis, and prolong survival time for tumor patients. However, chemotherapy can also cause normal tissue damage while killing cancer cells, which means that chemotherapy side effects may occur. The side effects induced by chemotherapy seriously influence a patient’s tolerance of and compliance with chemotherapy.

Gastrointestinal side effects are the most common side effects, affecting 75% of tumor patients. These side effects include nausea and vomiting, dyspepsia, hiccups, constipation, and oral ulcers. Therefore, relieving these chemotherapy side effects with effective nursing is an urgent matter. Presently, patients generally take drugs to relieve chemotherapy side effects, but drug therapy may cause new side effects. In addition, the efficacy for delayed vomiting by drug therapy is not obvious. The auricular acupoints therapy, which is a nursing technique used in TCM, has been used in recent years to treat patients during chemotherapy and presents no side effects. Furthermore, it has a good efficacy and is inexpensive. This study summarizes the operation method and the application of auricular acupoints therapy in patients suffering from the side effects of chemotherapy to provide evidence for further research in the treatment and nursing of patients during chemotherapy.

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Peer review under responsibility of Shanxi Medical Periodical Press.

http://dx.doi.org/10.1016/j.cnre.2016.06.004
2095-7718/© 2016 Shanxi Medical Periodical Press. Publishing services by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).
2. A summary of auricular acupoints therapy

2.1. Definition

Auricular acupoints therapy is an external treatment method, which is developed on the basis of auricular acupuncture therapy. It needs to put the vaccaria seed on the auricular acupoints accurately, and make patients feel hot, anesthetic, distending-like and pain by kneading, tapping, pinching, pressing the acupoints.

2.2. The mechanism

2.2.1. The mechanism of chemotherapy drugs causing the gastrointestinal side effects

Because a chemotherapy course can last for an extended period of time, patients may become weak, and the function of their zang and fu (viscera) may become deficient. As an exogenous pathogenic factor, chemotherapy can injure the spleen and the stomach, disorder the qi and blood, disturb the transportation and transformation of the spleen, and impair the harmonious descending of the stomach. The qing-qi (lucid qi) is not ascending, and the turbid qi flows in reverse, which leads to nausea and vomiting. Hiccups are caused by the adverse rising of the stomach qi. Oral ulcers are caused by fire flames up.

2.2.2. The mechanism of auricular acupoints therapy

Twelve meridians are on the flux in the ears, and each viscera is connected to the ears in our body. The application of auricular acupoints therapy, through stimulating certain auricular acupoints, is to activate the meridians and collaterals on the whole body and to regulate the function of the internal organs, qi, and blood to relieve the gastrointestinal side effects. The stomach acupoints balance the stomach qi and promotes antiemetic function. The shenmen acupoints work for sedation, tranquilization, and has some antiemetic effect, while the jiaogan acupoints work for sedation, tranquilization, and has a good effect. If a patient is classified as degree II or IV, the treatment is considered effective. If a patient is classified as degree III or IV, the treatment is considered ineffective. However, some learners choose the National Cancer Institute Common Toxicity Events Standard (NCI-CTCAE) as the evaluation parameter.

### Table 1

<table>
<thead>
<tr>
<th>Authors</th>
<th>Frequency of pressing</th>
<th>Duration of pressing</th>
<th>Intension of pressing</th>
<th>Start time</th>
<th>End time</th>
<th>Effective rate/%</th>
<th>Ear or ears</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liu10</td>
<td>More than 3 times/d</td>
<td>1–2 min</td>
<td>Sour, anesthesia, sinking, distension, pain</td>
<td>30 min before chemotherapy</td>
<td>End of chemotherapy</td>
<td>92.0</td>
<td>Ear</td>
</tr>
<tr>
<td>Zhang11</td>
<td>1 time/20 min; pressing when patients want to vomit</td>
<td>5 min</td>
<td>Anesthesia, pain</td>
<td>30 min before chemotherapy</td>
<td>Not given</td>
<td>90.8</td>
<td>Not given</td>
</tr>
<tr>
<td>Jin12</td>
<td>3 times/d</td>
<td>10–20 s</td>
<td>Distension, pain, burning</td>
<td>1 day before chemotherapy or when chemotherapy starts</td>
<td>4–6 day after treatment</td>
<td>72.4</td>
<td>Not given</td>
</tr>
<tr>
<td>You13</td>
<td>3–5 times/d</td>
<td>1–2 min</td>
<td>Sour, anesthesia heat, distension, pain</td>
<td>Not given</td>
<td>Not given</td>
<td>Not given</td>
<td>Ear</td>
</tr>
<tr>
<td>Xie14</td>
<td>3 times/d</td>
<td>2 min</td>
<td>Distension, heat, pain</td>
<td>Day when chemotherapy was received</td>
<td>End of chemotherapy</td>
<td>94.7</td>
<td>Ears</td>
</tr>
<tr>
<td>Sun15</td>
<td>3–5 times/d</td>
<td>1 time/4 h</td>
<td>Sour, heat, distension, pain</td>
<td>30 min before chemotherapy</td>
<td>End of chemotherapy</td>
<td>85.0</td>
<td>Ear</td>
</tr>
<tr>
<td>Li10</td>
<td>More than 3 times/d</td>
<td>1–2 min</td>
<td>Sour, anesthesia, distension, pain, heat</td>
<td>30 min before chemotherapy</td>
<td>End of chemotherapy</td>
<td>90.5</td>
<td>Ear</td>
</tr>
<tr>
<td>Qin12</td>
<td>3–5 times/d</td>
<td>3 min</td>
<td>Pain, sour, anesthesia heat, slight pain</td>
<td>1 day before chemotherapy</td>
<td>5 days</td>
<td>90.0</td>
<td>Ears</td>
</tr>
<tr>
<td>Han13</td>
<td>3–4 times/d</td>
<td>3–5 min</td>
<td>Pain, sour, anesthesia heat, slight pain</td>
<td>30 min before chemotherapy</td>
<td>1 week</td>
<td>97.5</td>
<td>Ear</td>
</tr>
</tbody>
</table>
3. Application of auricular acupoints therapy

3.1. Nausea and vomiting

Li\textsuperscript{16} et al observed the effect of auricular acupoints therapy for vomiting induced by chemotherapy in cervical cancer patients. Eighty-four subjects were randomly divided into a control group and an observation group. The cases in the control group received common antiemetic drugs, while the subjects in the observation group received additional auricular acupoints therapy 30 min before chemotherapy until the end of the chemotherapy. The results showed that the rate of nausea and vomiting was significantly lower in the observation group than the rate in the control group. In addition, the quality of daily life was improved in the observation group as compared with the control group.

To explore the effect of auricular acupoints therapy in relieving vomiting induced by chemotherapy and to observe its effect on the usage of Ondansetron, Bi\textsuperscript{20} conducted a randomized controlled trial. It was found that auricular acupoints therapy can reduce the dose of Ondansetron in patients undergoing chemotherapy.

You\textsuperscript{13} et al observed the effect of auricular acupoints therapy in preventing EP chemotherapy-induced gastrointestinal reaction and evaluated its safety. The patients who received EP chemotherapy were randomly divided into two groups. The observation group was given ear bean pressure, and the control group was not given auricular acupoints therapy. Then, the gastrointestinal reactions and the stress states were observed. It was observed that in the cases of abdominal pain, abdominal distention, nausea, vomiting, and blood glucose level, the HAMD, HAMA, and NRS scores of the observation group were significantly lower than the scores in the control group. However, the insulin levels in observation group were signifi cantly higher than those in the control group. Therefore, they pointed out that auricular acupoints therapy has positive clinical value.

3.2. Hiccups

Lu\textsuperscript{21} et al applied auricular acupoints therapy in intractable hiccups induced by chemotherapy. Fifty-four tumor patients were randomly divided into an observation group and a control group. The cases in the control group received common acupuncture, while those in the observation group received additional auricular acupoints therapy combined with acupuncture injections for 6 days. The study showed that auricular acupoints therapy combined with point injections had a better effect than common acupuncture.

In addition, Hu\textsuperscript{21} et al applied auricular acupoints therapy for preventing the occurrence of oral ulcers for gastric cancer patients during chemotherapy. The results showed that auricular acupoints therapy could prevent the occurrence of oral ulcers for stomach tumor patients during chemotherapy and can reduce ulcer severity. Xiao\textsuperscript{25} found that auricular acupoints therapy combined with abdominal massage can improve the defecation of tumor patients.

3.3. Application of auricular acupoints therapy combined with other therapy

To increase the effect of auricular acupoints therapy in gastrointestinal side effects induced by chemotherapy, many learners applied it in combination with other therapies, such as point injection, point massage, acupuncture, and moxibustion (Table 2).

4. Prospect

Auricular acupoints therapy in relieving the gastrointestinal side effects induced by chemotherapy is based on the function of promoting circulation of the qi and blood, freeing meridians and collaterals, adjusting nerves, and balancing the endocrine system. Its application becomes more and more broad, and the effects also continue to obtain recognition. However, there is no criteria or uniform application of auricular acupoints therapy for its method, such as the frequency of pressing, the duration of pressing, and the start and end times. Therefore, the best times and frequency should be further explored. All of the analyses showed that, as a nursing technique used in TCM, auricular acupoints therapy is simple, convenient, and inexpensive and has a significant curative effect. It should be used in patients during chemotherapy. At the same time, medical staff should do further research on the therapy so that more patients can benefit from it.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Combined with other therapy</th>
<th>Sample</th>
<th>Interventions</th>
<th>Auricular acupoint</th>
<th>Conclusions</th>
</tr>
</thead>
</table>
| Liu\textsuperscript{22} | Moxibustion | 120 | Control group: metoclopramide (im) 
Observation group: additional application of auricular acupoints therapy combined with moxibustion before 5 days of chemotherapy | Stomach, liver, spleen, cardia | Combined therapy can prevent gastrointestinal side effects induced by Cisplatin and (or) Adriamycin |
| Wang\textsuperscript{23} | Point-application | 90 | Control group: common antiemetic therapy 
Observation group: additional application of auricular acupoints therapy and point-application | Stomach, duodenum, large intestine, sympathetic, subcortical, shenmen | Combined therapy can improve efficacy of Cisplatin and improve appetite |
| Ding\textsuperscript{24} | Point injection | 21 | Control group: Ondansetron hydrochloride injection (i.v.) 
Observation group: auricular acupoints therapy and point injection | Stomach, liver, brain, esophagus, intestine, shenmen | Combined therapy has an obvious effect |
| Huang\textsuperscript{25} | Point embedding | 360 | Control group: common use of Ondansetron hydrochloride injection (i.v.) 
Observation group: additional use of auricular acupoints therapy and point embedding | Spleen, stomach, diaphragm, nerve point | Combined therapy is an effective method to prevent vomiting induced by chemotherapy. It should be extension in clinical |
Conflicts of interest

All contributing authors declare no conflicts of interest.

Acknowledgments

First, we would like to express our appreciation to Chengdu University of Traditional Chinese Medicine. In addition, we thank teachers, especially Miss Zhong Zhen for valuable information regarding TCM English, and useful advice on this manuscript.

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