Author’s response to reviews

Title: Anti-inflammatory effect of Ganluyin, a Chinese classic prescription, in chronic pharyngitis rat model

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Author’s response to reviews:

Dear Editor:
Thank you for your work on our manuscript titled “Antiinflammatory effect of Ganluyin, a Chinese classic Prescription, in chronic pharyngitis rat model” (BCAM-D-20-00842). We would
like to thank the reviewers for their hard work and their kindly suggestions. Based on the comment and request, we revised the manuscript. Here below is our description on revision according to the reviewers’ comments.

Reviewer 1:
1. The authors did not explain the bioavailability of GLY in any part of the manuscript since they told that it is clinically being used already. They should add it to introduction or even in discussion part.

The authors’ Answer:
Indeed, The GLY has been widely used in clinic already. In ancient Chinese medicine literature, GLY could be used for patients with nasopharyngeal discomforts among the people, such as sore throat or oral ulcers. Previous studies have demonstrated that GLY could inhibit cell migration [1, 2], block angiogenesis [3], and suppress secretion of some inflammatory cytokines. In human oral cancer cells, GLY extract could suppress tumor necrosis factor alpha (TNF-α) expression through the NF-κB, AKT, and ERK-dependent pathways [4]. One study combined the advantages of using a large-scale clinical database and a laboratory approach to investigate the potential benefits of using adjunctive GLY treatment in patients with CP [5]. They included all patients diagnosed with NPC during 1997-2009 and followed until 2011 in Taiwan. And used 1:1 frequency matching by age, sex, comorbidity, conventional treatment, and index year to compare the GLY users and non-GLY users (n = 2542 each). Finally, we could find patients treated with GLY had a lower risk of mortality and a better survival probability. The clinical efficacy of GLY is clear after treatment, and the sore throat gradually reduces or even disappears after treatment. The clinical bioavailability is more than 90% [6]. Current evidence indicates that the clinical total efficiency of GLY was better than conventional western medicine therapy or other treatments [7]. More than surprisingly, the use of GLY treatment also has not any adverse reactions and other clinical side effects [8]. It can be seen from the above that the Traditional Chinese Medicine (TCM) as a new complementary medicine and alternative therapies, has important guiding significance in clinical treatment [9].

Thus, the formula has been widely used to recuperate sore throat clinically in China, which has high cure rates for treatment of CP in clinical [10, 11].

Above all, I have added it to discussion part. (Discussion section, line 336-351, page 12).

The formula is a standardized formula, which is a Chinese classic famous Prescription. GLY comes from the “Tai Ping Hui Min He Ji Ju Fang” (hereinafter referred to as the “Ju Fang”) written by the medical scientist Chen Shiwen and others as early as the Song Dynasty. It has been more than 800 years ago history and then it has been included in many ancient books. In ancient Chinese medicine literature, GLY could be used for patients with throat diseases, such as ulcers, sore throat, cough, etc. Nowadays, the formula also has been widely used to recuperate sore throat clinically in China, which has high cure rates for treatment of CP in clinical.

According to ancient records, Ganluyin (GLY), a classic Chinese medicine formula consisted of ten TCMs, including the root of Scutellariae Radix, Rehmanniae Radix, Rehmanniae Radix Praeparata, Asparagi Radix, Ophiopogonis Radix and Praeparata Cum Melle, the stem of Dendrobii Caulis, the aboveground of Artemisiae Scopariae Herba, the leaf of Eriobotryae Folium, the fruit of Aurantii Fructus. And the dosage is 7.4g for each flavor, 74g for one prescription totally. The extraction process is water extraction, specific methods can be seen in the manuscript. Also, these plants were purchased from Zhejiang Inte Pharmaceutical Co., Ltd. and grown in sera conditions in a standardized way. They can provide the guarantee for the growth, identification, authenticity, and quality standardize of these Chinese herbal medicines. Therefore, the plants, the dosages, and the extraction process, are all maintain fix and consistence. To be able to guarantee that each time they will have the same effect in long term use of the GLY for the patients.

In addition, according to your suggestions, we will consider the plan of developing a complete set of fingerprints of different batches prepared from different source of plants collected at different times in the future, in order to further perfect the standard of the dosage for the patients.

The compositions and full details of GLY were shown in Table S1 in the supplementary data. Please see the attached file for details.

Table S1. The composition and full details of GLY
<table>
<thead>
<tr>
<th>No.</th>
<th>Chinese name</th>
<th>Abbreviation</th>
<th>Botanical name</th>
<th>Plant family</th>
<th>Part used</th>
<th>Original proportions</th>
<th>Weight (g)</th>
<th>Batch numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Huang Qin</td>
<td>HQS</td>
<td>SCUTELLARIAE RADIX</td>
<td>Labiatae</td>
<td>Root</td>
<td>17.4180304</td>
<td>304</td>
<td>180</td>
</tr>
<tr>
<td>2</td>
<td>Shi Hu</td>
<td>SH</td>
<td>DENDROBII CAULIS</td>
<td>Ranko</td>
<td>Stem</td>
<td>17.4181126</td>
<td>1126</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Di Huang</td>
<td>DH</td>
<td>DREHMANNIAE RADIX</td>
<td>Scrophulariaceae</td>
<td>Root</td>
<td>17.41812016</td>
<td>1016</td>
<td>190</td>
</tr>
<tr>
<td>4</td>
<td>Shu Di Huang</td>
<td>SD</td>
<td>DREHMANNIAE RADIX</td>
<td>Scrophulariaceae</td>
<td>Root</td>
<td>17.41812016</td>
<td>1016</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Tian Dong</td>
<td>TD</td>
<td>ASPARAGI RADIX</td>
<td>Liliaceae</td>
<td>Root</td>
<td>17.41901016</td>
<td>1016</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Mai Dong</td>
<td>MD</td>
<td>DOPHIOPOGONIS RADIX</td>
<td>Liliaceae</td>
<td>Root</td>
<td>17.41812059</td>
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</tr>
<tr>
<td>7</td>
<td>Yin Chen</td>
<td>YC</td>
<td>CARTEMISIAE SCOPARIAE HERBA</td>
<td>Compositae</td>
<td>Aboveground</td>
<td>17.41808024</td>
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<td></td>
</tr>
<tr>
<td>8</td>
<td>Pi Pa Ye</td>
<td>PP</td>
<td>PYERIOBOTRYAE FOLIUM</td>
<td>Rosaceae</td>
<td>Leaf</td>
<td>17.4180428</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Zhi Qiao</td>
<td>ZG</td>
<td>GLYCRRHIZAE RADIX ET RHIZOMA PRAEPARATA CUM MELLE-Leguminosae</td>
<td>Root</td>
<td>17.41902013</td>
<td>13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. The authors are advised to check all the abbreviations throughout the tex. Mention the full name of them where it first appeared and also they should add all the abbreviations in the abbreviation list.
All the other small corrections are mentioned on the manuscript text.
The authors’ Answer:
We have already checked all the abbreviations throughout the tex, mentioned the full name of them where it first appeared and also added all the abbreviations in the abbreviation list. (e.g. Background section, line 100-101, page 5; Background section, line 106-108, page 5; Methods section, line 124-125, page 6).
All the other small corrections are revised on the manuscript text.
The word of “conclusion” is revised to correct spelling. (Abstract section, line 48, page 2). The names of the plants are corrected to small italic letters as it is used internationally, and started the second word with small letters. (Background section, line 82-85, page 4). The words of “in vivo” are corrected to italics. (Conclusion section, line 418, page 14). Thank you very much for your kindly comments!

Reviewer 2:
1. Just a minor revision needed regarding the phyto-chemistry approach especially information about the compounds.
Please provide the supplementary data of compound identification. Other compounds are possible also consist in the extract that need to be stated.
The authors’ Answer:
Fig. S1 Identification of main peak
Fig. 1. GLY water extract. 1 = naringin, 2 = neohesperidin, 3 = baicalin, 4 = wogonoside. (A) Comparative with mixed reference standards solution. a = naringin standard, b = hesperidin standard, c = neohesperidin standard, d = baicalin standard, e = wogonoside standard. (B) Fig. 2. Comparative with single reference standards solution. a = naringin standard, (C) c = neohesperidin standard, (D) d = baicalin standard, (E) e = wogonoside standard. (F) The data that show the comparative with reference standards in the supplementary data. Please see the attached file for details.

I quite agreed that the extract also contains with others components in the minor amount. Ganluyin (GLY), a classic Chinese medicine formula consisted of ten TCMs, including the root of Scutellariae Radix, Rehmanniae Radix, Rehmanniae Radix Praeparata, Asparagi Radix, Ophiopogonis Radix and Praeparata Cum Melle, the stem of Dendrobii Caulis, the aboveground of Artemisiae Scopariae Herba, the leaf of Eriobotryae Folium, the fruit of Aurantii Fructus. By searching databases such as Traditional Chinese Medicine System Pharmacology (TcmSP) and reviewing extensive literature, we could find some others compounds in GLY. The Scutellariae Radix contains about 75 active compounds, the most important of which are baicalin, wogonoside, scutellarein, chrysin, dihydrobaicalin, eriodictiol, 5,7,4′-trihydroxy-6-methoxyflavanone, isoborneol, etc [1]. The Rehmanniae Radix and Rehmanniae Radix Praeparata contains about 76 active compounds, the most major of which are isoacteoside, rehmaglutin A, rehmaglutin D, 5-HMF, catalpol, leonurus glycoside, pilose glycoside, etc [2, 3]. The Asparagi Radix contains about 32 active compounds, the most major of which are quercetin, aspafilioside A, palmitic acid, methylprotodioscin, gracillin, etc [4]. The Ophiopogonis Radix contains about 64 active compounds, the most important of which are ophiopogonin P, ophiopogonin Q, glycoside C, nolinospirosiside, ophiofuropsiside, ophiopogonone B, β-sitosterol-β-d-glucoside, trans-p-coumaric acid, etc [5]. The Praeparata Cum Melle contains about 87 active compounds, the most main of which are asernestioside A, betaine, coumarin, crystal VI, rhamnocitrin-3-O-glucoside, 3-hydroxy-2-picoline, isoferulic acid, bifendate, isoflavanone, etc [6]. The Dendrobii Caulis contains about 190 active compounds, the most major of which are naringenin, dihydrogen resveratrol, dendoroflorin, citrusin C, citronellol, isoschaftoside, dihydrosyringin, uridine, adenosine, syringic acid, vanillic acid, dendoracandin A, 7-methoxycoemarin-6-O-β-D-pyruvoglucose, essential oils, etc [7, 8]. The Artemisiae Scopariae Herba contains about 53 active compounds, the most important of which are scoparone, methylugenol, salicylic acid, rutin, vanillin, Artepillon C, eupalitin, 5-hydroxyferulate, quercetin, etc [9]. The Eriobotryae Folium contains about 142 active compounds, the most main of which are myrcene, myristic acid, pyrene, diphencyprone, anisaldehyde, arjunolic acid, hesperidin, neohesperidin, methyl salicylate, oleandric acid, ursolic acid, p-xylene, etc [10]. The Aurantii Fructus contains about 17 active compounds, the most chief of which are hesperidin, neohesperidin, naringin, naringenin, myrcene, nobiletin, N-methyltyramine, etc [11]. We also found some others components in the extract, like the hesperidin, but the content is too low to be detected. We will further increase the detection range and sensitivity in the future. Thank you very much for your kindly comments!


All indicated above are revised in the manuscript and described exactly what amendments have been made to the manuscript text and where these can be viewed in this response letter. Thank you and all the reviewers for the kind advice.
Sincerely
Rong Luo