Calotropis gigantea Leaves Extract (CGLE) increases anticancer effect of 5-Fluorouracil and Decreases effect of Doxorubicin on Human Colon Cancer WiDr cell line

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Abstract

Objective: The objective of this study was to examine whether Calotropis gigantea leaf extract (CGLE) synergizes the therapeutic potential of 5-fluorouracil and Doxorubicin against colon cancer WiDr cell lines.

Methods: MTT assay was used to measure the growth inhibitory effect of the combination.

Results: CGLE 3 μg/ml which was combined with S-FU 62.5 μg/ml, 125 μg/ml, and 250 μg/ml, synergistically inhibited the growth of WiDr colon cancer cells line with Combination index value (CI) ranging from 0.26 to 0.67. In contrast, combination of CGLE with Doxorubicin was shown antagonistically inhibited on the growth of colon cancer WiDr cell line, with Combination Index value (CI) ranging from 0.9 to 3.2 (moderate antagonistic effect until highly antagonistic effect).

Conclusion: Combination therapy of CGLE showed strong synergism with S-FU and strong antagonism with doxorubicin in inhibiting the growth of human colon cancer WiDr cells line.

Keywords: Calotropis gigantea, S-FU, doxorubicin, colon Cancer Cell Lines, WiDr.

Background

In previous study, the ability of Calotropis gigantea leaves extract (CGLE) as an anticancer has been investigated. The result showed that CGLE is cytotoxic to WiDr cell line (IC50=12.3 μg/ml) and T47D cell line (IC50=8.75 μg/ml). In this study, we investigated the antineoplastic activity of CGLE in combination with Doxorubicin and 5-Fluorouracil on WiDr cell line.

Material and Methods

MTT assay was used to measure the growth inhibitory effect of the combination. Synergistic efficacy was subjected to median effect analysis with nonexclusive model as previously described by Chou and Talalay.

Figure 2. Antagonism effect of CGLE with Doxorubicin on WiDr Cell line

Figure 3. synergisme effect of CGLE with S-FU on WiDr Cell line

Result

Table of cell viability , Combination Index (CI) and effect classification of combination therapy of CGLE extract and 5-Fluorouracil on WiDr cell line

<table>
<thead>
<tr>
<th>No</th>
<th>Combination</th>
<th>Cell Viability (μg/ml)</th>
<th>Combination Index (CI)</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CGLE 3 μg/ml</td>
<td>1.20</td>
<td>0.26</td>
<td>Antagonistic</td>
</tr>
<tr>
<td>2</td>
<td>CGLE 3 μg/ml</td>
<td>0.98</td>
<td>0.26</td>
<td>Antagonistic</td>
</tr>
<tr>
<td>3</td>
<td>CGLE 3 μg/ml</td>
<td>0.78</td>
<td>0.26</td>
<td>Antagonistic</td>
</tr>
<tr>
<td>4</td>
<td>CGLE 3 μg/ml</td>
<td>0.68</td>
<td>0.26</td>
<td>Antagonistic</td>
</tr>
<tr>
<td>5</td>
<td>CGLE 3 μg/ml</td>
<td>0.58</td>
<td>0.26</td>
<td>Antagonistic</td>
</tr>
<tr>
<td>6</td>
<td>CGLE 3 μg/ml</td>
<td>0.48</td>
<td>0.26</td>
<td>Antagonistic</td>
</tr>
<tr>
<td>7</td>
<td>CGLE 3 μg/ml</td>
<td>0.38</td>
<td>0.26</td>
<td>Antagonistic</td>
</tr>
<tr>
<td>8</td>
<td>CGLE 3 μg/ml</td>
<td>0.28</td>
<td>0.26</td>
<td>Antagonistic</td>
</tr>
<tr>
<td>9</td>
<td>CGLE 3 μg/ml</td>
<td>0.18</td>
<td>0.26</td>
<td>Antagonistic</td>
</tr>
<tr>
<td>10</td>
<td>CGLE 3 μg/ml</td>
<td>0.08</td>
<td>0.26</td>
<td>Antagonistic</td>
</tr>
<tr>
<td>11</td>
<td>CGLE 3 μg/ml</td>
<td>0.02</td>
<td>0.26</td>
<td>Antagonistic</td>
</tr>
<tr>
<td>12</td>
<td>CGLE 3 μg/ml</td>
<td>0.01</td>
<td>0.26</td>
<td>Antagonistic</td>
</tr>
</tbody>
</table>

Discussion

Combination therapy of CGLE showed strong synergism with S-FU and strong antagonism with doxorubicin in inhibiting the growth of human colon cancer WiDr cells line.

Acknowledgment

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References


Calotropis gigantea (widuri)

Figure 1. The effect of CGLE, Doxorubicin, S-FU monotherapy and combination therapy to morphometry of WiDr cell line. Cell morphology was examined by using inverted microscope with magnification 400x

Table: The effect of CGLE, Doxorubicin, S-FU monotherapy and combination therapy to morphometry of WiDr cell line.

Figure 1: The effect of CGLE, Doxorubicin, S-FU monotherapy and combination therapy to morphometry of WiDr cell line. Cell morphology was examined by using inverted microscope with magnification 400x

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