Efficacy of 5-FU or Oxaliplatin Monotherapy over Combination Therapy in Colorectal Cancer

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Abstract

Recent clinical and research development supports the use of 5-fluorouracil in combination with oxaliplatin for the treatment of patients with advanced colorectal cancer (CRC). 5-Fluorouracil (5-FU), which is as an anti-metabolite, is a widely used cytostatic drug. Although the rate of response, quality of life and overall survival differs between CRC patients, the above combination remains a widely used chemotherapeutic regimen. In some cases, a cancer stem cell (CSC) population may resist the majority of chemotherapeutic models. This study investigated if monotherapy is more efficacious than 5-fluorouracil and oxaliplatin combined for the treatment of CRC, using a CRC cell line and a CSC-like line. Cell viability was evaluated by cellular-based assays, and quantitative polymerase chain reaction (q-PCR) assays were performed to assess the expression of specific genes (TYMS, DNMT1, NANOG, DHFR, SHMT1, ERCC1, DPYD) correlated with 5-FU and oxaliplatin resistance. We observed that 5-fluorouracil was more effective in both CRC and CSCs. This finding proved the hypothesis that, in some cases, monotherapy may be more successful in CRC treatment than a drug combination that may be cytotoxic and inflict adverse side effects.

Keywords

5-Fluorouracil, Oxaliplatin, FOLFOX, Colon Cancer Stem Cells

1. Introduction

Colorectal cancer (CRC) is the third most commonly diagnosed cancer in worldwide. The lifetime risk of developing CRC is approximately 5%, depending on the individual and other risk factors, and 5-year survival for

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