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ORIGINAL RESEARCH

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Probiotic *Saccharomyces cerevisiae* var. *boulardii* supernatant inhibits survivin gene expression and induces apoptosis in human gastric cancer cells

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Abstract

Natural anticancer drug and compounds with other great benefits are of interest recently due to lower side effects than chemotherapy for cancer treatment and prevention. Different natural and synthetic drugs have been suggested to be used for treatment of gastric cancers, the second deadly cancer worldwide. The aim of this study was to investigate anticancer activity of SBS including inducing apoptosis and inhibition of survivin gene expression in gastric cancer cells. We evaluated cell viability, inducing apoptosis and change in survivin gene expression of EPG85-257P (EPG) and EPG85-257RDB (resistant to Daunorubicin, RDB) cell lines under exposure of SBS after 24, 48, and 72 hr. We found that SBS decreased cell viability, induced apoptosis, and reduced survivin gene expression in treated EPG and RDB cells (with the significant IC_{50} values of 387 and 575 μg/ml after 72 and 48 hr for EPG and RDB cells respectively). However, we observed SBS was more efficient to induce apoptosis in EPG than RDB cells. We strongly suggest SBS be considered as a prospective anticancer agent or in formulation of complementary medication to treat and prevent gastric cancers.

KEYWORDS

apoptosis, gastric cancer cells, *Saccharomyces boulardii* supernatant, survivin gene expression

1 | INTRODUCTION

Gastric cancer, the fourth most prevalent and the second deadly cancer worldwide, has been dramatically predominant in the developing countries. The incidence of this chronic disease has daily been increasing in the developed countries (Van Cutsem et al., 2016). The etiology of gastric cancer contributes to some major risk factors consisting of *Helicobacter pylori* infection, dietary factors, tobacco consumption, and obesity (Thrift & El-Serag, 2020). There are two main strategies against gastric cancer, prevention and treatment.