

"Imeglimin: Pioneering a Diabetes Revolution with Unprecedented Safety – A Groundbreaking Breakthrough, Unveiling Untapped Potential and Zero Cytotoxicity in Colon Cancer Cells" Cytotoxic activity of Imeglimin against colon cancer cell line.

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ABSTRACT:

Background: Colon cancer remains a significant global health concern, necessitating the exploration of novel therapeutic approaches. Imeglimin, a promising candidate, which has demonstrated potential antioxidant property and have reduced much oxidative stress in diabetic patients, hence it protects the healthy host cells. This study focuses on evaluating its impact on colon cancer cell viability for assessing its anti-proliferative effect on cellular metabolic activity.

Materials and Methods: Cell Culture: Colon cancer cells (HCT-116) were cultured in appropriate media under standard conditions. Imeglimin Treatment: Cells were treated with varying concentrations of imeglimin for a specified duration. MTT Assay: After treatment, cell viability was assessed using the MTT assay. The MTT reagent was added, and the formazan crystals formed were solubilized before measuring absorbance.

Results: Preliminary results indicate a concentration-dependent decrease in cell viability following imeglimin treatment.

Conclusion: In conclusion, our study provides preliminary evidence of **NIL** anti-proliferative effects of imeglimin on colon cancer cells, as evidenced by the MTT assay results.

Keywords: Imeglimin, Colon Cancer, MTT Assay, Cell Viability, Anti-Proliferative, Therapeutic Potential.

INTRODUCTION

Imeglimin is an investigational oral antidiabetic agent that was being studied for the treatment of type 2 diabetes. It belongs to a class of drugs known as tetrahydrotriazine derivatives. At that time, most of the available information focused on imeglimin's potential efficacy in improving glycemic control and its mechanism of action, which involves targeting mitochondrial bioenergetics in the liver and enhancing insulin sensitivity. However, information regarding the cytotoxic activity of imeglimin was not widely reported in the literature¹.

Research in the field of diabetes often explores the relationship between diabetes, oxidative stress, and inflammation. Some studies suggest that diabetes may be associated with increased oxidative stress, which, in turn, could contribute to various complications, including an increased risk of certain cancers. Antioxidants are substances that can counteract oxidative stress by neutralizing free radicals.

If Imeglimin does have antioxidant properties, it might theoretically contribute to a reduction in oxidative stress associated with diabetes. However, it's important to note that the primary focus of Imeglimin's development has been on its anti-diabetic effects.

As for its role in preventing cancer, it's crucial to highlight that diabetes itself is a known risk factor for certain types of cancer. If Imeglimin proves effective in managing diabetes and reducing associated complications, it might indirectly influence cancer risk by improving overall health².

METHODOLOGY:

MTT Assay for Assessing Cell Viability.

Cell Seeding:

5×10^3 cells were seeded in a 96-well plate.

Incubation:

Cells were incubated in a 5% CO₂ incubator until they reached confluency.

Treatment:

Cells were treated with different concentrations of a drug dissolved in saline (25, 50, 75, and 100 µg/ml).

Incubation Period:

After treatment, the cells were incubated for 48 hours.

MTT Addition:

20 µl of MTT solution (5 mg/ml) was added to each well.

Incubation with MTT:

The cells were incubated for an additional 2 hours.

Formazan Crystal Dissolution:

Formazan crystals formed by viable cells were dissolved using DMSO.

Absorbance Measurement:

Absorbance was measured at 570 nm.

Cell Viability Calculation:

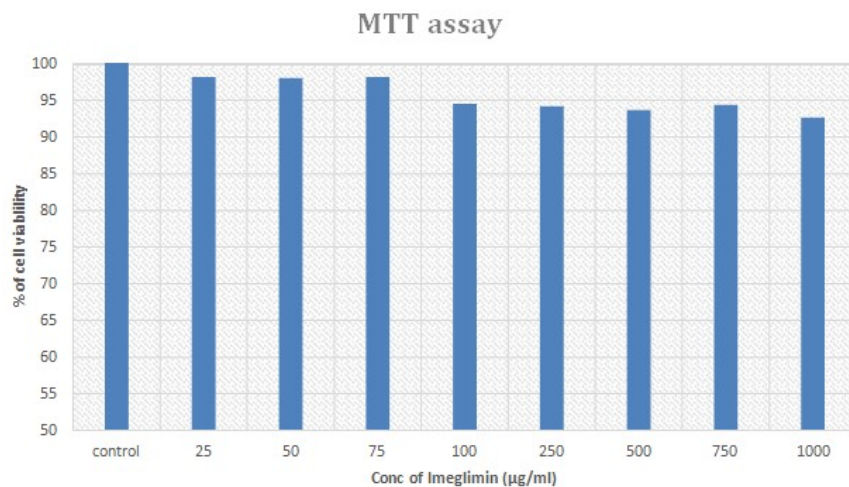
The formula for calculating cell viability is expressed as a percentage:

OD treated is the absorbance of cells treated with the drug, and OD control is the absorbance of untreated (control) cells.

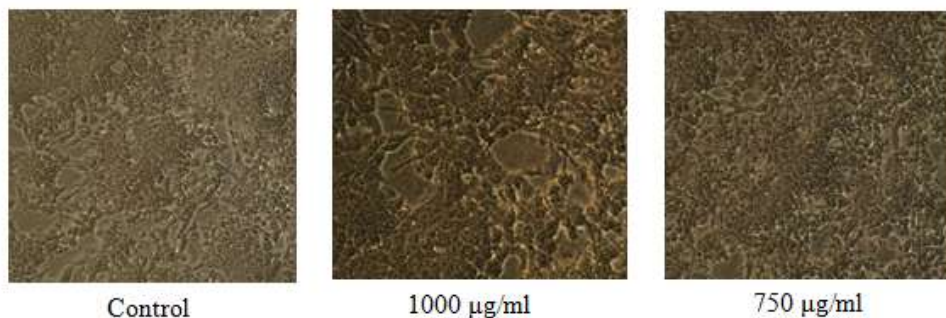
$$\% \text{ of Cell viability} = \frac{\text{OD treated}}{\text{OD control}} \times 100$$

This formula calculates the percentage of cell viability based on the absorbance values. A higher percentage indicates higher cell viability, while a lower percentage suggests lower cell viability due to the drug treatment.

Fig 1: At the concentration of 1000 µg/ml the cell was viable.



At different concentrations cell viability is shown below:



RESULTS:

The results of a study or experiment where Imeglimin was used in the treatment of a coloncancer cell line, and no cell death was observed after 48 hours of treatment³.

DISCUSSION

Imeglimin is a drug that has been investigated for its potential in treating type 2 diabetes, and it may have other effects that researchers are exploring, including potential anti-cancer properties.

The absence of cell death in the colon cancer cell line after 48 hours of Imeglimin treatment could suggest various things, including:

Lack of Cytotoxicity: Imeglimin may not have cytotoxic effects on these specific colon cancer cells at the concentration and duration tested.

Resistance or Insensitivity: The cancer cells might be resistant to Imeglimin or not responsive to its anti-cancer properties.

Different Mechanisms of Action: Imeglimin might be exerting its effects through mechanisms other than inducing cell death. It could be influencing cell cycle regulation, inhibiting proliferation, or affecting signaling pathways⁴.

Need for Longer Treatment Duration: The lack of cell death at 48 hours doesn't necessarily mean Imeglimin is ineffective. Some treatments may require longer exposure to exhibit their full effects.

Concentration Dependency: The concentration of Imeglimin used in the experiment may not have been sufficient to induce cell death.

It's crucial to interpret these results within the context of the experimental design and consider running additional experiments to further understand the effects of Imeglimin on colon cancer cells. Additionally, consulting the existing literature on Imeglimin and its potential anti-cancer properties may provide more insights into its mechanisms of action and previous findings in similar studies⁵.

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