Future of Metformin in Treating Lung Cancer

Title: Metformin HCl Oral Preparation Exhibits Anticancer Activity In-vitro in a Human Non-small Cell Lung Tumour Cell Line

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S 19.3 million new cases of cancer are diagnosed worldwide according to GLOBOCAN 2020, a cancer database. Among them, lung cancer is the leading cause of death and is responsible for around 18% of cancer-related deaths. The prevalence of respiratory cancer increases with the number of smokers due to its strong association with lung cancer in both men and women.

Non-small cell lung cancer or NSCLC, a type of cancer that affects the lungs, is the most common type of lung cancer and accounts for about 85% of all lung cancer cases. NSCLC can develop when cells in the lungs grow abnormally and form a tumour. Common symptoms of NSCLC include a persistent cough, chest pain, shortness of breath, and coughing up blood. NSCLC is usually treated with surgery, chemotherapy, or radiation.

Recently, a drug called Metformin has been shown to have the ability to stop or slow the growth of cancer cells in the lab, and it may be a possible option for treating lung cancer in the future. This drug could potentially be used alongside existing treatments to improve their effectiveness.

Metformin is an oral medication commonly used to treat type 2 diabetes by reducing the amount of glucose produced by the liver and increasing insulin sensitivity to the body cells. In recent years, there has been growing evidence suggesting that Metformin may have anti-cancer effects, including in the treatment of NSCLC.

Researchers (Karim et.al) wanted to investigate if a medicine called Metformin HCl could stop the growth of lung cancer cells (known as A549 cells) in a study. They tested if the medication could prevent cancer cells from growing, killing them, or dividing. They examined how cancer cells responded to various medication doses and compared the results to untreated cancer cells.

Researchers used Metformin HCl 500mg oral tablet purchased from a regular pharmacy in Bartam, Penang, Malaysia. The tablet was crushed and mixed with distilled water, filtered, sterilised, and stored in a freezer. The drug was then diluted for each experiment. The culture media and chemicals related to the experiment were obtained from different companies in the United States of America including reagent kits for analysing apoptosis and cell cycle.

Apoptosis is a natural process of programmed cell death that occurs in the body as a way to remove damaged, old, or unnecessary cells. This process is important for the body to maintain normal tissue function, development, and growth. When cells undergo apoptosis, they shrink from blebs and break into fragments, which are then cleared up by specialised cells without causing inflammation or damage to surrounding tissues. Apoptosis plays a crucial role in various physiological and pathological processes, such as embryonic development, immune system regulation, cancer, and neurodegenerative diseases.

According to the study, Metformin HCl tablets have the potential to be applied as a treatment for NSCLC, because they were able to induce apoptosis with cell cycle arrest after 8 days without entirely stopping cell growth. Metformin also had no adverse effects on normal cells. The research also reveals that Metformin HCl oral tablets could be used to treat lung cancer. The medicine has demonstrated encouraging results in reducing cancer cell development and killing cancer cells while causing no harm to normal cells. However, more research is needed before it can be used as a standard treatment. The research has yet to rule out when it will be available for patients, but ongoing research and clinical trials will help determine how safe and effective it is. If the research is successful, it could become a new and improved treatment option for people with lung cancer in the future.

"Although the recent study on using Metformin as a potential treatment for lung cancer is promising, there are important factors that need further clarification," stated

Associate Professor Dr. Hairel Anuar Selamat, an Assistant Professor from the University of Cyberjaya. Dr. Hairel highlighted the study's lack of details regarding the source and quality of the Metformin used, the process of determining dosages, and how these dosages were standardised for testing. Despite recognising Metformin's potential for lung cancer treatment, he underscored the challenges ahead and stressed the need for more research. Dr. Hairel identified a significant obstacle in conducting research involving actual patients, which requires approval from the Ethical Committee. Such studies, he explained, could yield crucial insights into appropriate dosages, treatment duration, and potential side effects for lung cancer patients. He also pointed out the potential cost-effectiveness of Metformin, which could alleviate the financial burden of lung cancer treatment and redirect healthcare budgets towards preventive care. He cautioned, however, that the current research is in its early stages and cannot yet replace established mainstream treatments for lung cancer. eam treatments for lung cancer. Dr. Hairel remains hopeful about Metformin's future role in treating lung cancer, emphasising the necessity for more comprehensive research, particularly involving real-life patients. In his evaluation, the study marks a positive initial stride towards exploring Metformin's potential in lung cancer treatment.