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A study on the blood lactate level in Type II diabetic patients on oral antidiabetic drugs

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Abstract

After securing approval from relevant authorities, researchers at the Institute of Pharmacology at Madurai Medical College Madurai analyzed the effects of oral anti-diabetic medicines (sulphonylurea and biguanides) on patients with type II diabetes. Seventy individuals with Type II diabetes who had just been diagnosed were chosen. They are given the medications after giving their informed permission. The patients' blood was measured both before and after treatment. According to the research, biguanides raise the lactate level in the blood. Patients who are hypoxic are more likely to have adverse effects from biguanides.

Key-Words: Type II diabetes, Biguanides, Phenformin, Metformin, Sulphonylurea, Blood lactate

INTRODUCTION:

Diseases that cause cellular hypoxia include ischemia, infection, pulmonary and cardiac insufficiency, hepatic and renal failures, and metabolic disorders like diabetes. It is also a known side effect of biguanide treatment for those with NIDDM. Many people died of lactic acidosis after the introduction of biguanides in the 1950s in the United States. Therefore, they were made illegal. However, metformin results in a lower occurrence of lactic acidosis, and recorded occurrences almost all involve patients with preexisting renal or hepatic disorders. In subsequent years, only metformin is reintroduced. Metformin's widespread usage in Europe and Canada over the last few decades has led to its recent approval in the United States. Metformin and

phenformin are two biguanide oral antidiabetic medications, although the existing data on their role in inducing lactic acidosis and its prevalence are sketchy at best. Some people believe that these two medications, particularly phenformin and less so metformin, cause lactic acidosis on their own. However, there are many who argue that underlying hepatic and renal disorders, rather than the medications themselves, are to blame for lactic acidosis. This is true in particular while using metformin. These two claims are diametrically opposed to one another. This study was conducted to determine whether or not these two oral anti diabetic medicines are to blame for lactic acidosis and, if so, to what extent. diseases.

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Material and Methods

Blood lactate levels were compared between individuals receiving various oral hypoglycemic medications in this research. After receiving approval from the hospital's ethical review board, the study lasted from June 1999 to March 2000 (9 months). It was carried out at the hospital's endocrinology outpatient department. From the original pool of 79 patients, 9 had to withdraw owing to various personal reasons. All participants provided written informed permission before their participation in the research. Sulphonyl urea was used to treat 20 patients, metformin was used to treat another 20, and phenformin was used to treat another 20. Ten of them were given dietary and physical activity guidelines to follow. Before beginning treatment, these individuals' blood lactate levels were estimated.

Blood lactate was assessed one month after treatment ended. Before and after treatment, the patients' liver functions, kidney functions, blood glucose (fasting and post prandial 2 hours), and cholesterol levels were all assessed. The data was collated, and the student t-test was used to determine the study's statistical significance.

Results and Discussion

There is no significant change in blood lactate in patients taking sulphonyl urea & mealplan but there is a significant increase in those on metformin & phenformin therapy

This study reveals that sulphonylurea are safer with reference to lactic acidosis as they do not increase lactate level, while phenformin & metformin has the tendency for hyperlactatemia even though there is a slight variation in the degree of rise. When prescribed

for the patients without having a tendency for precipitating lactic acidosis due to hypoxia, both the drugs are safer & equally effective in Type II diabetic patients.

Conclusion

Based on the findings of this research, sulphonylurea are less dangerous in terms of lactic acidosis since they do not raise lactate level, but phenformin and metformin have a propensity for hyperlactatemia,

although to varying degrees. Both medicines are safe and similarly effective in treating Type II diabetes, provided they are given to individuals who are not at risk of developing hypoxic lactic acidosis.

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