8. RiboCeine and Diabetes

Osinubi A.A.A, Medubi L.J., Akang E.N., Sodiq L.K., Samuel, T.A., Kusemiju T., Osolu J., Madu D., Fasanmade O. A comparison of the anti-diabetic potential of D-ribose-Lcysteine with insulin, and oral hypoglycaemic agents on pregnant rats. Toxicology Reports, 2018(5):832-838.

Overview: Diabetes is the seventh leading cause of death in the US and a major cause of heart disease and stroke. Over 18% of pregnant women are affected by gestational diabetes. Insulin is generally the treatment of choice to control gestational diabetes because it does not cross the placenta. However, this treatment requires daily injections and therefore oral hypoglycemic agents (OHAs) are also used, although the safety of these drugs in pregnancy, is not fully understood. The drug, streptozotocin is toxic to the insulin producing beta cells of the pancreas and will cause diabetes within 24 hours. Oxidative stress has been implicated to play an important role in diabetic complications. The purpose of this study is to determine the antidiabetic potential of 4 OHAs and D-Ribose-L-Cysteine in comparison to insulin in pregnant streptozotocin-drug induced diabetic rats.

Methods: The study protocol included 40 pregnant female rats and had 8 study groups with 5 animals per group. Group A was the Negative Control – non-diabetic, Group B was the Positive Control – Diabetic; Group C received insulin; Group D received D-Ribose-L-Cysteine; Group E received Vildagliptin (OHA); Group F received Glibenclamide (OHA); Group G received Metformin (OHA) and Group H received Glipizide (OHA). Groups B-H received streptozotocin and developed diabetes within 24 hours.

Results: Blood glucose levels significantly decreased in all treatment groups compared to the diabetic control (p value < 0.0001). Insulin and D-Ribose-L-Cysteine had the greatest effect on blood glucose compared to the OHAs (p value < 0.0001). Malondialdehyde, a marker of oxidative stress (oxidation by-product of 24 polyunsaturated fats) was significantly decreased in the animals that received insulin, D-Ribose-L-Cysteine and OHAs (exception Group F) when compared to the diabetic positive control.

Conclusion: D-Ribose-L-Cysteine was similar to insulin in decreasing blood glucose levels in pregnant streptozotocin-drug induced diabetic rats The OHAs were less effective. D-Ribose-L-Cysteine mitigates lipid peroxidation in this pregnant diabetic rat model as demonstrated by a decrease malondialdehyde levels. This study demonstrated that the potential benefits of D-Ribose-L-Cysteine as an effective OHA and could serve as a potent adjuvant in the management of diabetes in pregnancy. Further studies to determine the efficacy and safety in humans should be conducted.