METFORMIN CO-ADMINISTERED WITH ORPHENADRINE PROFOUNDLY REDUCED FASTING BLOOD GLUCOSE LEVELS IN ALLOXAN-INDUCED HYPERGLYCAEMIC MALE RATS

Odugbemi A. I.[1,3], Akintola K. P.[1], Oladipo O.[1] and Abiola O.O.[1,2]

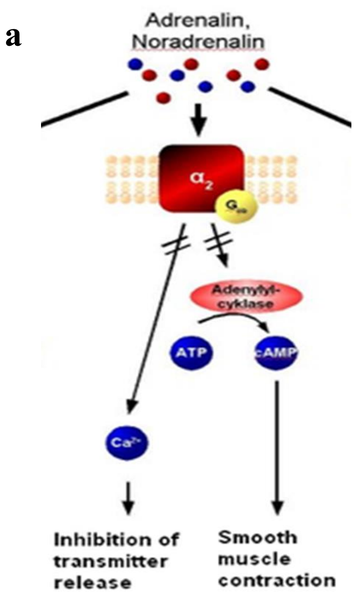
[1]Biochemistry Programme, College of Agriculture, Engineering and Science,
[2]Medical Laboratory Science Programme, College of Health Sciences,
Bowen University, Iwo, Osun State, Nigeria
[3]Biochemistry Department, FBMS, College of Medicine, University of Lagos, Lagos
Email: adeshina.odugbemi@gmail.com

INTRODUCTION

◊ Diabetes mellitus has become a global emergency with over 425 million cases and a projected increase to about 629 million by 2045. Metformin is a front line drug for treatment of type2 diabetes mellitus and there are evidence that it weakens oxidative capacity of muscles (Wessels *et al*., 2014) which may lead to spastic pain and muscular spasms. This therefore suggests the likelihood of diabetes patients to be prescribed muscular pain-relieving drugs of which Tizanidine and Orphenadrine are the most commonly used.

◊ Tizanidine is an α2 adrenergic receptor agonist (Coward, 1994) which inhibits insulin release in the pancreas and may be detrimental to diabetic patients. Hence, it can be hypothesised that drugs such as Metformin that are used in the treatment of diabetes may be contraindicated with the use of muscle relaxants such as Tizanidine and Orphenadrine.

◊ This study therefore investigated the efficacy of Metformin combined variously with Tizanidine and Orphenadrine in the treatment of diabetes mellitus.



https://en.wikipedia.org/wiki/Adrenergic_receptor

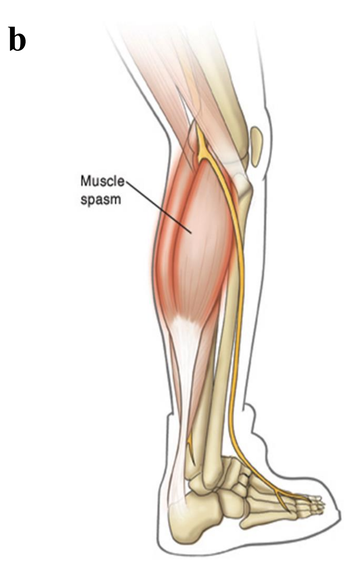


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Figure 1: (a) α2 adrenergic receptor (b) Spastic pain/Muscle spasm

METHOD

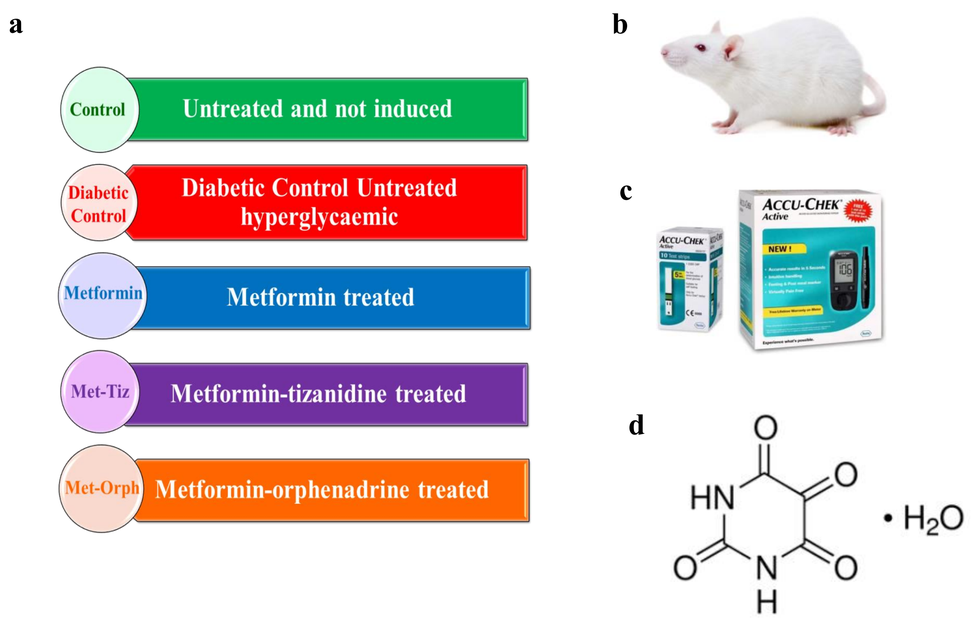

Figure 2: (a) Study design (b) Male Wistar rat (c) Accu-Chek glucometer (d) Alloxan monohydrate (150 mg/Kg/ body weight)

RESULT

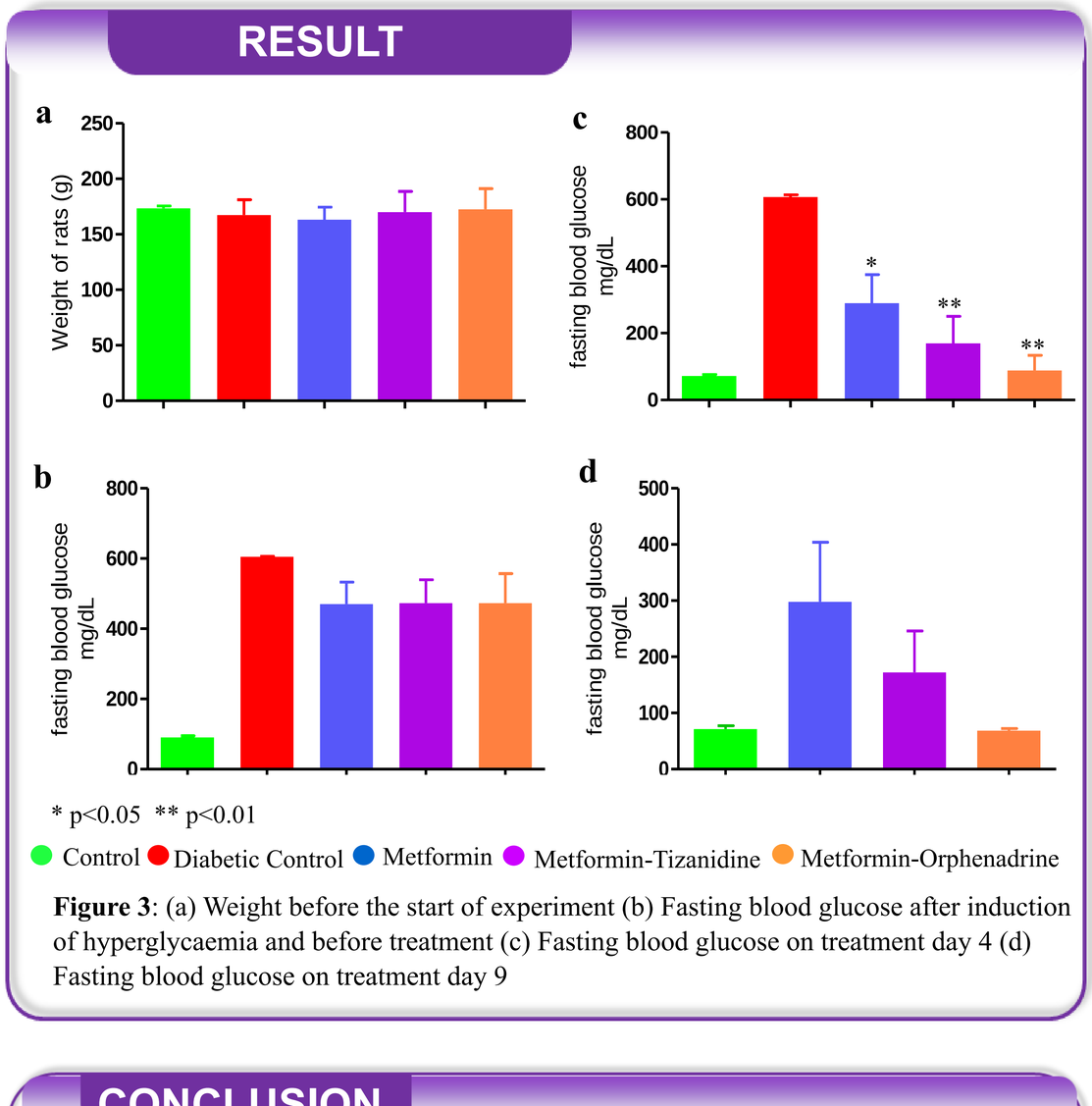

Figure 3: (a) Weight before the start of experiment (b) Fasting blood glucose after induction of hyperglycaemia and before treatment (c) Fasting blood glucose on treatment day 4 (d) Fasting blood glucose on treatment day 9

CONCLUSION

This study suggests that Tizanidine and Orphenadrine, each with metformin, synergistically elicited significant hypoglycaemic effect whose precise mechanisms are currently being studied.

REFERENCES

Coward DM (1994). Tizanidine: neuropharmacology and mechanism of action. Neurology 44:S6–10; discussion S10–11.

Wessels, B., Ciapaite, J., van den Broek, N.M.A., Nicolay, K., and Prompers, J.J. (2014). Metformin Impairs Mitochondrial Function in Skeletal Muscle of Both Lean and Diabetic Rats in a Dose-Dependent Manner. PLoS ONE 9, e100525.