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Introduction

Several studies have shown that diabetes mellitus, regardless of the cause, may modulate ChE activities in the blood and may cause an imbalance between true and pseudo ChE. It is known that type 2 diabetes mellitus is a metabolic disorder affecting enzymatic systems including cholinesterases. The impact of the disease over the susceptibility of cholinesterases to drugs used as cholinesterase inhibitors is not known.

Objectives

The present study assesses the correlation between oxidative stress and plasma cholinesterase activities in patients with type 2 diabetes mellitus and healthy individuals. Besides that, the *in vitro* inhibition of plasma and erythrocyte cholinesterase activities by dichlorvos was also evaluated.

Methods

100 healthy subjects and 100 type 2 diabetic patients from Azadi Teaching Hospital, Dohuk, Iraq were enrolled. The enrolled participants were not exposed to organophosphate insecticides or any medication that is known to interfere with cholinesterase activity. The criteria of WHO for diagnosis of type 2 diabetes were applied for confirming the diagnosis. A colorimetric method was used to determine plasma malondialdehyde concentration at 535 nm. Plasma and erythrocyte cholinesterase activities were determined by the Ellman's spectrophotometric method. A 10-minute cholinesterase-inhibitor incubation method was used to evaluate the inhibitory effect of dichlorvos at 0.5 and 1 μ M on plasma and erythrocyte cholinesterase activities.

Conclusions

Diabetes type 2 renders the patients more susceptible to oxidative stress. Patients with diabetes could be more sensitive to toxicity caused by cholinesterase inhibitors. Accordingly, caution should be practiced in patients using cholinesterase inhibitors.

Results

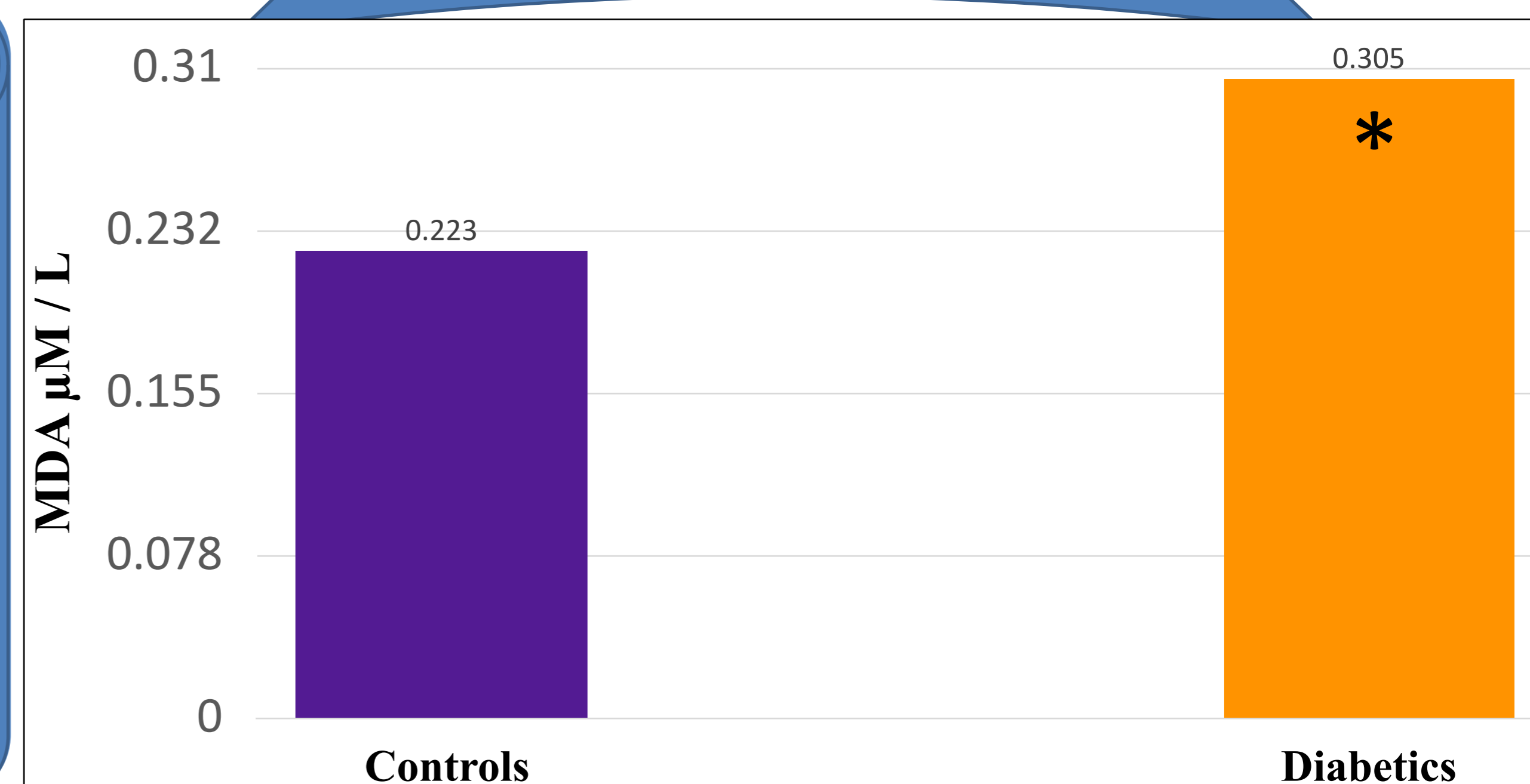


Figure 1: Plasma malondialdehyde concentration in the studied subjects. *P<0.05.

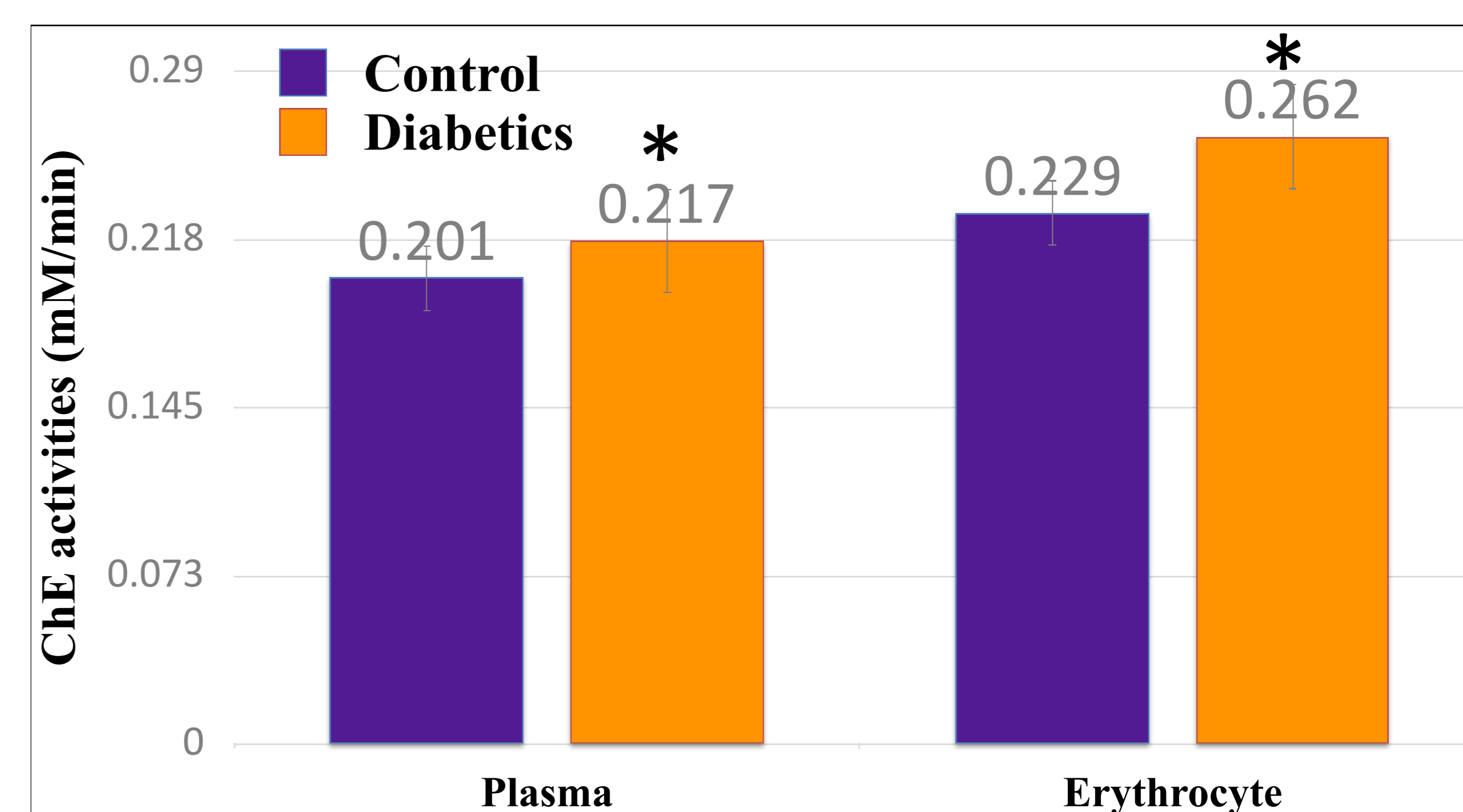


Figure 2: Plasma and erythrocyte cholinesterase (ChE) activities. *P<0.05.

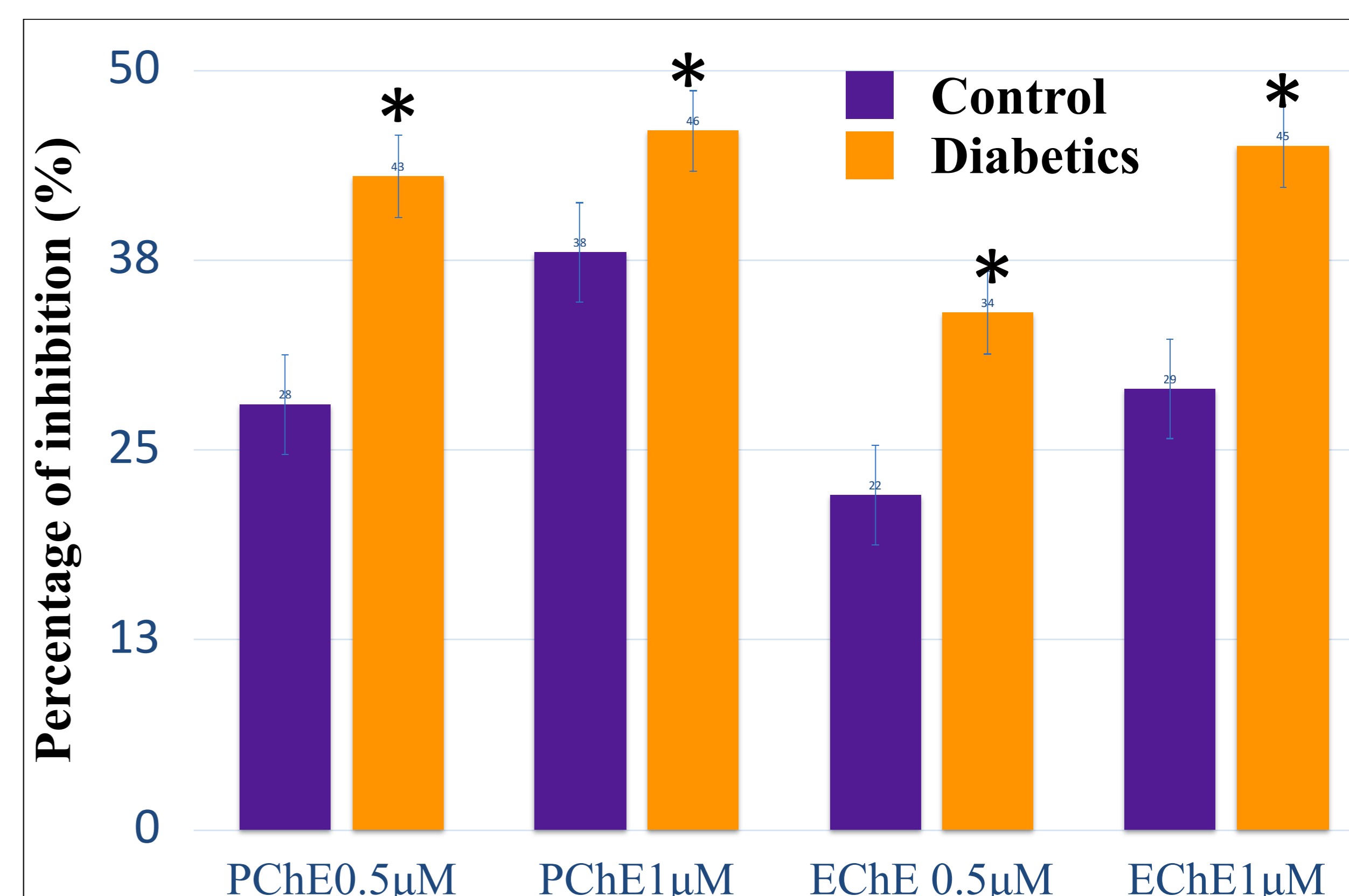


Figure 3: Percentages of *in vitro* inhibition of plasma (PChE) and erythrocyte (EChE) cholinesterase activities by dichlorvos 0.5 and 1 μ M. *P<0.05.

