



A low GLP-1 response among patients treated for acute organophosphate and carbamate poisoning: a comparative cross-sectional study from an agrarian region of Sri Lanka

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Abstract

Higher incidence of diabetes along with increased use of pesticides is seen in Southeast Asia. Recent hypothesis postulated a link between acetylcholinesterase inhibitor insecticides and type 2 diabetes through the GLP-1 pathway. This study compares the GLP-1 response between groups with low and high red blood cell acetylcholinesterase (RBC-AChE) activity. A comparative cross-sectional study was conducted amongst patients who were within 3 months after an acute organophosphate or carbamate poisoning (acute group) and amongst vegetable farmers with low (chronic group) and high (control group) RBC-AChE activity. Acute (366 mU/μM Hb) and chronic (361 mU/μM Hb) groups had significantly lower RBC-AChE activity in comparison to the control (471 mU/μM Hb) group ($P < 0.0001$). Only the acute group, which has had atropine therapy, showed a significantly lower 120 min value in comparison to the control group ($P = 0.0028$). Also, the acute group had significantly low late ($P = 0.0287$) and total ($P = 0.0358$) responses of GLP-1 in comparison to the control group. The findings of the study allude towards attenuation of GLP-1 response amongst patients after acute organophosphate and carbamate poisoning. The possibility of an atropine-mediated attenuation of GLP-1 response was discussed.

Keywords Atropine · Organophosphate · Carbamate · Diabetes mellitus · Glucagon-like peptide-1 · Incretin effect · Acetylcholinesterase activity

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